

**ARNO<sup>®</sup>**  
**WERKZEUGE**

**Tools and Indexable Inserts for Turning and Threading**  
*Utensili ed inserti di Tornitura e Filettatura*  
Systèmes d'outillage pour tournage et filetage

# TURNING & THREADING



# OUTSTANDING. ECCEZIONALE. REMARQUABLE.

Turning or Swiss type turning, grooving, drilling or milling: whatever your requirements are, it's worth your while to take a look at ARNO. We have a solution for almost every metal-working application. We have the right mix of experience, pioneering spirit and quality to ensure that you get the best out of your production with the right tool systems, tool management solutions and clever innovations.

*Tornitura, troncatura, scanalatura, foratura o fresatura: Indipendentemente da quale sia il vostro progetto - vale sempre la pena valutare i prodotti ARNO. Abbiamo una soluzione per quasi ogni applicazione nell'ambito della lavorazione ad asportazione truciolo. Combinando esperienza, spirito pionieristico e qualità, garantiamo che con i nostri utensili ad elevata precisione, con le soluzioni per la gestione degli utensili e con le nostre intelligenti innovazioni, riuscirete ad ottenere il meglio dalla vostra linea di produzione.*

Décolletage, usinage de gorges, tournage, perçage ou fraisage : Quel que soit votre projet, n'hésitez pas à passer chez ARNO, cela en vaut la peine. Nous avons une solution pour quasiment toutes les applications d'enlèvement de copeaux. Avec la bonne combinaison d'expérience, d'esprit pionnier et de qualité, nous veillons à ce que vous tiriez le meilleur de votre fabrication à l'aide de systèmes d'outils, de solutions de gestion des outils et d'innovations intelligentes sur mesure.





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# IT'S ALL TO DO WITH EFFICIENCY.

**Reliable, precise and versatile: ARNO turning systems are up to the test all along the line.**

Why should you opt for ARNO when it comes to turning? Because you benefit from the high quality of our well-conceived systems, from reliable processes and high productivity. ARNO offers you the right solution for all items from holders and tool holders through to inserts. For applications ranging from internal or external machining, thin-walled workpieces or components for shipbuilding, for thread turning or profiling, for steel or super alloys.

Every solution is packed with comprehensive know-how and excellent service, all-inclusive. We provide a personal consultation to ensure that our products get the best out of your production. We can rely on fast deliveries due to our large warehouse. And because design, production and sales are all under one roof, we will find a profitable solution for complex applications within a short period of time. Find out for yourselves!





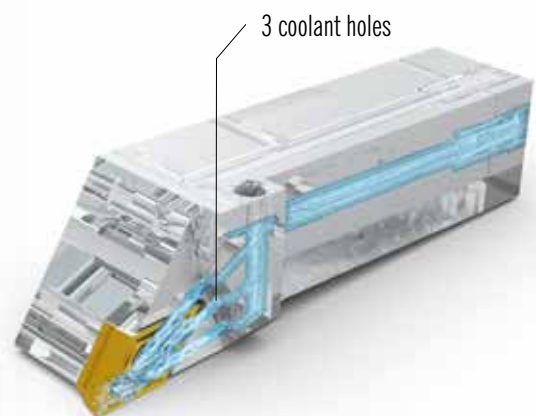
# INNOVATIVE HIGHLIGHTS FOR MORE PRODUCTIVITY.

From holder to insert: you work much more efficiently with innovative solutions from ARNO.



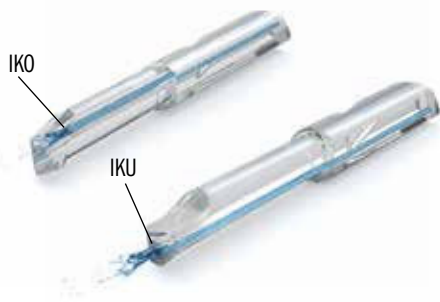
## Maximum flexibility: KMH- tool holders with VDI shank from ARNO.

Normal or overhead assembly, with or without through tool coolant: you're always on the right track with KMH tool holders. Access the machine interface without any hoses or interfering edges which can trap chips. For an application that is user-friendly and reliable. Coolant supply with direct transfer from the holder to the tool holder is simple and reliable thanks to the use of scaling. Then you benefit from repeatability, stability and flexibility in every case.



## Three times cool: ARNO tool holders for external machining with three coolant holes.

Cooling the cutting edge is ensured three times. Three holes guide the coolant directly to the cutting zone. Chips are removed efficiently, increasing tool life. Thanks to scaling, coolant transfer on KMH tool holders from ARNO is so simple – with no interfering hose connections and with absolute precision. If required, coolant transfer is customisable.



**Cooling when things get tight: Inserts with coolant channel for the ARNO Mini-System AMS.**

Rigid centring, guaranteed top height and precise coolant supply for maximum wear protection: this is so simple for the ARNO Mini-System AMS and the matching AMS inserts with cooling channel. Overhead coolant channels (IKO) are ideal for through holes since chips can be routed to the front away from the flute. For blind holes we recommend underneath coolant channels (IKU) to guide chips behind the flute for evacuation.



**Care for detail gives top results: indexable inserts from ARNO.**

From the precision machining of thin-walled workpieces to roughing large components: we have the best indexable insert for every application. Especially when the application involves demanding materials and workpiece geometries, all roads lead to ARNO. Reliable, high-quality surface quality is within your reach, whether it's with the largest range of high-positive indexable inserts in the world or with precision-ground inserts produced in our grinding shop.

# SO THAT EVERYTHING RUNS SMOOTHLY.

ARNO systems for turning – an overview.



## Turning holders | External machining

KMH holders and tool holders from 8x8 to 32x32.

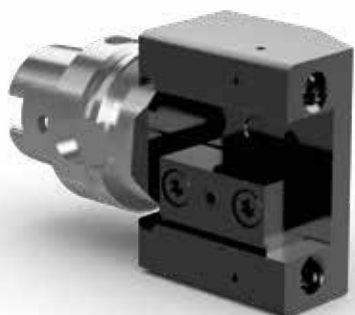
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## Boring bars | Internal machining

Boring bars made of steel and solid carbide with shank diameters from 8 to 40 mm.

Starting on page 115



## HSK-T tool holders

Standardised to ISO 12164-3/4 or specially for STAMA machining centres.

Starting on page 169



## ISO indexable inserts

The right geometries and grades for all materials and applications.

Starting on page 223



**ISO indexable inserts - brazed**

CBN indexable inserts for hard turning and PKD indexable inserts for the high-speed machining of non-ferrous metals.

**Starting on page 423**



**SHARK-CUT | Multi purpose tool**

Multi purpose for turning and drilling with only one tool.

**Starting on page 585**



**ARNO Mini-System AMS | Internal machining**

For internal machining starting at 0.7 mm diameter and up to 50 mm drilling depth.

**Starting on page 475**



**SIM system | Internal machining**

Modular system for internal machining starting at 6.7 mm bore diameter.

**Starting on page 551**



**Thread turning system**

For all thread types, helix angles and dimension starting at a minor diameter of 3.2 mm.

**Starting on page 629**



**Tool Management**

Versatile solutions ensure transparent tool management in every production shop.

**Starting on page 729**

# OUTSTANDING WHEN IT COMES TO SERVICE.

**We do our utmost for you to achieve success: from comprehensive consulting by our machining experts and fast implementation of special solutions through to overnight delivery.**

As a family-owned company, we focus on successful long-term business relations with our customers. That's why we prefer to develop well-designed products than start short-term sales promotions. And if you use these products in your production, we make sure that there is a benefit for you: efficient, reliable and simple production processes.



## PERSONAL

At ARNO you are assigned a personal contact who stands at your side to optimise production processes. An honest and fair consultation offers you genuine added value – either by regular visits to your offices or by telephone.



## FAST

When time is an issue, you can rely on ARNO. When you place your order by 18.00 CET (on Friday by 16.00), you receive your tool the next working day. Of course, we can only guarantee this speed if we have the product in stock – but in all cases, we have a very short implementation for special solutions.



## COMPETENT

You benefit from decades of experience, concentrated technical know-how and our Swabian talent for inventiveness. We have the right solution even for complex machining operations. And if we don't, we'll find one. Since our R&D, Production and Sales departments are all under one roof, we can react fast and start extensive tests.



## We are close to you all over the world

Our tools are in use all over the world – that's why we are close to you all over the world. You can reach us easily through our subsidiaries and distributors.



● Subsidiaries   ● Distributors

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# QUI RUOTA TUTTO ATTORNO ALL'EFFICIENZA.

**Affidabili, precisi, versatili: i sistemi ARNO per la tornitura convincono su tutta la linea.**

Perché Lei dovrebbe scegliere ARNO per la tornitura? Perché grazie all'elevata qualità dei nostri sistemi ben progettati potrà avvalersi di procedimenti sicuri e aumentare la produttività. Sia che si tratti di lavorazioni interne o esterne, di componenti in filigrana o di componenti per la costruzione navale, della filettatura o della tornitura di profili, di acciaio o di superleghe, ARNO Le offre la giusta soluzione dal supporto, all'utensile di supporto fino all'inserto da taglio.

Ogni soluzione comprende il nostro vasto know-how e un'assistenza eccellente. Con una consulenza personalizzata facciamo in modo che con i nostri prodotti Lei riuscirà a ottenere il meglio dalla Sua produzione. Grazie al nostro grande magazzino potrà contare su consegne rapide. E dal momento che da noi progettazione, produzione e vendita sono gestite centralmente, anche per i compiti più complessi siamo in grado di offrirle una soluzione vantaggiosa in breve tempo. Se ne convinca di persona!



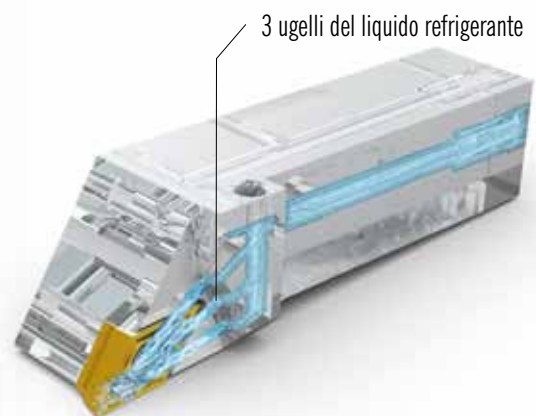
# CARATTERISTICHE INNOVATIVE PER MAGGIORE PRODUTTIVITÀ.

Dall'alloggiamento al tagliente: con le soluzioni innovative di ARNO lavorerà in maniera più efficiente.



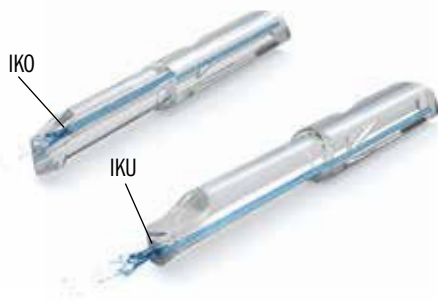
## Massima flessibilità: portautensili KMH con stelo VDI di ARNO.

Montaggio normale o invertito con o senza adduzione interna refrigerante: con i portautensili KMH Lei andrà sempre sul sicuro. Per un'applicazione confortevole e sicura, l'interfaccia con la macchina è completamente priva di tubi flessibili e bordi interferenti, in cui i trucioli potrebbero restare impigliati. L'adduzione del refrigerante con trasferimento diretto dall'alloggiamento all'adattatore diventa semplice e sicura grazie ai cambi di scala. In questo modo è possibile avere in ogni caso accuratezza di ripetibilità, stabilità e flessibilità.



## Tripla Coolness: utensili di supporto ARNO per la lavorazione esterna dotati di tre ugelli refrigeranti.

In questo caso il raffreddamento del tagliente è assicurato tre volte: tre ugelli conducono il liquido refrigerante direttamente nella zona di taglio, i trucioli vengono allontanati in maniera efficiente e la durata viene così aumentata. Grazie al fattore di scala, il trasferimento del refrigerante insieme ai portautensili KMH di ARNO è più facile che mai - completamente senza collegamenti fastidiosi con tubi flessibili e con la massima precisione. Se necessario il passaggio del liquido refrigerante può essere realizzato anche in maniera personalizzata.



### Raffreddamento quando gli spazi sono più stretti: inserti con canale di raffreddamento per ARNO Mini-System AMS.

Posizione centrale stabile, altezza delle punte garantita e adduzione del refrigerante precisa per la massima protezione dall'usura: ARNO Mini System AMS e gli inserti AMS adatti, dotati di canale di raffreddamento, garantiscono la massima semplicità. Per i fori passanti sono ideali i canali di raffreddamento dall'alto (IKO) poiché in questo modo i trucioli vengono convogliati in avanti, lontano dal tagliente. Per i fori ciechi consigliamo canali di raffreddamento dal basso (IKU) in modo che i taglienti vengano convogliati dietro al tagliente e possano essere lavati via.



### Massima cura fino all'ultimo dettaglio per ottenere i migliori risultati: inserti speciali di ARNO.

Dalla lavorazione di precisione di pezzi in filigrana fino alla sgrossatura di grandi componenti: per ogni applicazione abbiamo l'inserto più adatto. Soprattutto quando si tratta di materiali e geometrie di pezzi più complessi, non è possibile fare a meno di ARNO. Grazie alla più grande selezione al mondo di inserti altamente positivi o di altri inserti rettificati di precisione nel nostro reparto di rettifica - Lei potrà ottenere superfici di alta qualità in maniera affidabile.



# PERCHÉ TUTTO FUNZIONI SENZA INTOPPI!

Panoramica dei sistemi ARNO per la tornitura cilindrica.



## Portautensili | Lavorazione esterna

Alloggiamenti e adattatori KMH da 8x8 a 32x32.

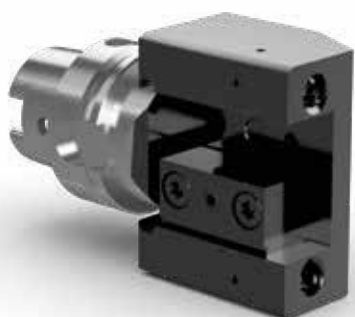
da pagina 31



## Bareni | Lavorazione interna

Bareni in acciaio e metallo duro con diametro dello stelo da 8 a 40 mm.

Da pagina 115



## Portautensili HSK-T

A norma ISO 12164-3/4 o speciali per centri di lavorazione STAMA.

da pagina 169



## Inserti ISO

Le giuste geometrie e varietà per tutti i materiali e le applicazioni.

da pagina <?>



**Inserti ISO, equipaggiati**

Inserti CBN per la tornitura di materiali duri e inserti PKD per la lavorazione ad alta velocità di metalli non ferrosi.

da pagina 423



**SHARK-CUT | Utensile multifunzione**

Multifunzionale per la tornitura e la foratura con un unico utensile.

da pagina 585



**ARNO Mini-System AMS | Lavorazione interna**

Per la lavorazione interna a partire da 0,7 mm di diametro e fino a 50 mm di profondità di foratura.

da pagina 475



**Sistema SIM | Lavorazione interna**

Un sistema modulare per la lavorazione interna di fori con diametro a partire da 6,7 mm.

da pagina 551



**Sistema di filettatura**

Per tutti i tipi di filettatura, passo e per tutte le dimensioni a partire da un diametro di nocciolo di 3,2 mm.

da pagina 629



**Gestione Utensili**

Soluzioni versatili garantiscono una gestione trasparente degli utensili per ogni tipo di produzione.

da pagina 729

# UN'ASSISTENZA ECCEZIONALE.

**Facciamo del nostro meglio affinché Lei possa raggiungere il successo: dalla consulenza completa da parte dei nostri esperti di lavorazione ad asportazione di truciolo, alla implementazione rapida di soluzioni speciali, fino alla consegna durante la notte.**

Come azienda a conduzione familiare, per noi è assolutamente importante instaurare una buona collaborazione a lungo termine con i nostri clienti. Ecco perché preferiamo sviluppare prodotti ben progettati piuttosto che avviare promozioni di vendita a breve termine. E se sceglierà questi prodotti per la Sua produzione, faremo in modo che ne sia valsa la pena: processi di produzione efficienti, affidabili e semplici.



## PERSONALE

In ARNO Le verrà assegnato un contatto personale che resterà al Suo fianco per ottimizzare i Suoi processi produttivi. Una corretta consulenza Le offre un vero valore aggiunto – sia tramite visite periodiche nella Sua azienda, sia al telefono.



## VELOCE

Quando la rapidità è tutto, Lei può contare su ARNO: se effettua il Suo ordine entro le 18:00 (il venerdì entro le 16:00), riceverà l'utensile il giorno lavorativo successivo. Possiamo garantire questi tempi solo per gli articoli che abbiamo in magazzino – ma in ogni caso, siamo in grado di realizzare rapidamente anche gli utensili speciali.



## COMPETENTE

Approfitti della nostra esperienza decennale, del nostro know-how e del nostro talento svevo per inventiva. Abbiamo la giusta soluzione anche per le lavorazioni più complesse. E nel caso non l'avessimo, la troveremo. Da noi progettazione, produzione e vendita sono tutti sotto lo stesso tetto, siamo in grado di reagire velocemente e di avviare test approfonditi.

## Le siamo vicini in tutto il mondo

I nostri utensili vengono utilizzati in tutto il mondo – è per questo che Le siamo vicini ovunque. Grazie ai nostri partner commerciali e alle nostre sedi in molti paesi può contattarci molto facilmente.



● Sedi ● Partner commerciali

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# TOUT TOURNE AUTOUR DE L'EFFICACITÉ.

**Fiables, précis, polyvalents : les systèmes ARNO de tournage sont convaincants sur toute la ligne.**

Pourquoi devriez-vous choisir ARNO pour vos opérations de tournage ? Parce que vous bénéficiez de processus sûrs et d'une productivité élevée grâce à la grande qualité de nos systèmes ingénieux. Qu'il s'agisse d'usinage intérieur ou extérieur, de composants ou d'éléments délicats pour la construction navale, de filetage ou de profilage, d'acier ou de superalliages, ARNO vous offre la solution adaptée du support, en passant par le porte-outil, jusqu'à la plaquette de coupe.

Chaque solution comprend un large savoir-faire et un service exceptionnel. Grâce à des conseils personnalisés, nous veillons à ce que vous tiriez le meilleur de votre fabrication à l'aide de nos produits. Notre vaste entrepôt nous permet de vous livrer rapidement. Et comme chez nous le développement, la production et la vente sont regroupées sous le même toit, nous trouvons nous-mêmes et rapidement une solution avantageuse à chaque tâche complexe. Laissez-vous convaincre !





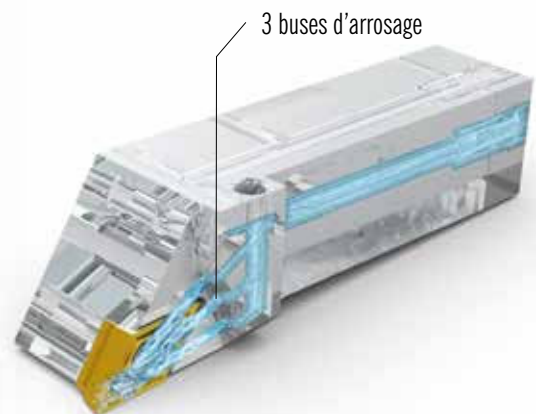
# POINTS FORTS INNOVANTS POUR PLUS DE PRODUCTIVITÉ.

Du porte-outil à la plaquette : grâce aux solutions innovantes d'ARNO, vous travaillez bien plus efficacement.



## Flexibilité maximale : supports d'outils KMH avec tige VDI d'ARNO.

Normal ou retourné, avec ou sans refroidissement interne : avec les supports d'outils KMH, vous faites toujours le bon choix. Pour une application tout en confort et sûre, l'interface avec la machine est conçue entièrement sans tuyaux ni rebords gênants dans lesquels des copeaux pourraient rester coincés. L'arrivée de liquide de refroidissement avec transfert direct du support au support de serrage se fait simplement et de manière sûre grâce à des mises à l'échelle. Dans tous les cas, vous bénéficiez de la précision de répétition, de la stabilité et de la flexibilité.



## Refroidissement triple : porte-outils ARNO pour usinage extérieur doté de trois buses d'arrosage.

Le refroidissement de l'arête de coupe est garanti trois fois plutôt qu'une : trois buses amènent le liquide de refroidissement dans la zone de coupe, les copeaux sont évacués efficacement et la durée de vie est augmentée. Grâce à une mise à l'échelle, le transfert du liquide de refroidissement avec les supports d'outils KMH d'ARNO n'a jamais été aussi facile : tout cela sans raccords de tuyaux encombrants et avec une précision absolue. Au besoin, le transfert de liquide de refroidissement peut aussi être posé à part.



### Le refroidissement pour les espaces réduits : inserts de coupe avec canal de refroidissement pour le mini système ARNO AMS.

Couche intermédiaire stable, hauteur de pointe garantie et guidage précis du liquide de refroidissement pour une protection maximale contre l'usure : cela est tout à fait possible grâce au mini système ARNO AMS et aux inserts de coupe AMS dotés d'un canal de refroidissement. Des canaux de refroidissement par le haut sont une solution idéale (IKO) pour les perçages traversants, car ils évacuent les copeaux de la dent vers l'avant. Pour les perçages borgnes, nous recommandons des canaux de refroidissement par le bas (IKU) permettant de diriger les copeaux derrière la dent et de les rincer.



### Du soin jusque dans les moindres détails pour des résultats optimaux : plaquettes de coupe amovibles d'ARNO.

De l'usinage de précision de pièces délicates à l'ébauche de gros composants : nous avons la plaquette de coupe amovible idéale pour chaque application. Surtout lorsqu'il s'agit de matériaux et de géométries d'outils exigeants, ARNO ne se défile devant rien. Que ce soit avec la plus grande sélection au monde en plaquettes de coupe amovibles hautement positives ou avec d'autres plaquettes rectifiées avec précision : vous obtenez des surfaces de grande qualité en toute confiance.

# TOUT TOURNE TOUJOURS COMME PRÉVU !

Aperçu des systèmes ARNO de tournage.



## Porte-outil de tournage | Usinage extérieur

Supports KMH et supports de serrage de 8x8 à 32x32.

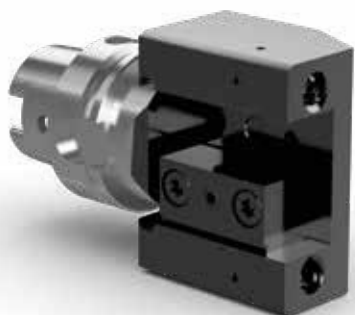
À partir de la page 31



## Barres d'alésage | Usinage intérieur

Barres d'alésage en acier et carbure monobloc avec diamètres de tige de 8 à 40 mm.

À partir de la page 115



## Supports d'outils HSK-T

Normalisés selon ISO 12164-3/4 ou spécialement pour les centres d'usinage STAMA.

À partir de la page 169



## Plaquettes de coupe amovibles ISO

Les bonnes géométries et formes pour tous les matériaux et toutes les applications.

À partir de la page 223



**Plaquettes de coupe amovibles ISO équipées**

Plaquettes de coupe amovibles CBN pour le tournage dur et plaquettes de coupe amovibles PCD pour l'usinage à grande vitesse de métaux non ferreux.

**À partir de la page 423**



**SHARK-Cut | Outil multifonction**

Multifonctionnel pour le tournage et perçage avec un seul outil.

**À partir de la page 585**



**Mini système ARNO AMS | Usinage intérieur**

Pour l'usinage intérieur à partir de 0,7 mm de diamètre et jusqu'à 50 mm de profondeur de perçage.

**À partir de la page 475**



**Système SIM | Usinage intérieur**

Système modulaire pour l'usinage intérieur à partir d'un diamètre de forage de 6,7 mm.

**À partir de la page 551**



**Système de filetage**

Pour tous les types de filetage, pas et dimensions à partir d'un diamètre central de 3,2 mm.

**À partir de la page 629**



**Gestion des outils**

Diverses solutions garantissent une gestion transparente des outils pour chaque fabrication.

**À partir de la page 729**

# REMARQUABLE EN MATIÈRE DE SERVICES.

**Nous mettons tout en œuvre pour votre succès : du conseil complet par nos experts de l'usinage, en passant par la mise en œuvre rapide de solutions spécifiques, jusqu'à la livraison effectuée sous 24 heures.**

En tant qu'entreprise familiale, notre priorité est axée sur une bonne coopération à long terme avec nos clients. C'est pourquoi nous préférons développer des produits sophistiqués plutôt que de lancer des actions promotionnelles à court terme. Et si vous utilisez ces produits dans votre production, nous veillons à ce que cela soit rentable pour vous : grâce à des processus de fabrication extrêmement efficaces, sûrs et simples.



### PERSONNALISATION

Chez ARNO, vous avez un interlocuteur personnel qui vous accompagne dans l'optimisation de vos processus de fabrication. Que ce soit lors de l'une des visites régulières chez vous ou par téléphone, le conseil honnête et juste vous apporte une réelle valeur ajoutée.



### RAPIDITÉ

Lorsqu'il s'agit de rapidité, vous pouvez compter sur ARNO : Pour toute commande effectuée jusqu'à 18 heures (le vendredi jusqu'à 16 heures), votre outil est chez vous le jour ouvrable suivant. Bien entendu, nous ne pouvons garantir cette cadence que pour les produits en stock, mais nous réalisons également les solutions spécifiques très rapidement.



### COMPÉTENCE

Vous profitez d'une expérience de longue date, d'une expertise concentrée et de notre mentalité de passionnés de solutions mécaniques. Même pour les opérations d'usinage exigeantes, nous avons une solution adaptée. Et si ce n'est pas le cas, nous en trouvons une. Comme chez nous la construction, la production et la vente sont regroupées sous le même toit, nous pouvons réagir vite et réaliser des tests complets.

## À votre service partout dans le monde

Nos outils sont utilisés partout dans le monde, c'est pourquoi nous sommes là pour vous dans le monde entier. Avec des filiales et des partenaires commerciaux présents dans de nombreux pays, vous pouvez facilement nous joindre.



● Filiales ● Partenaires commerciaux

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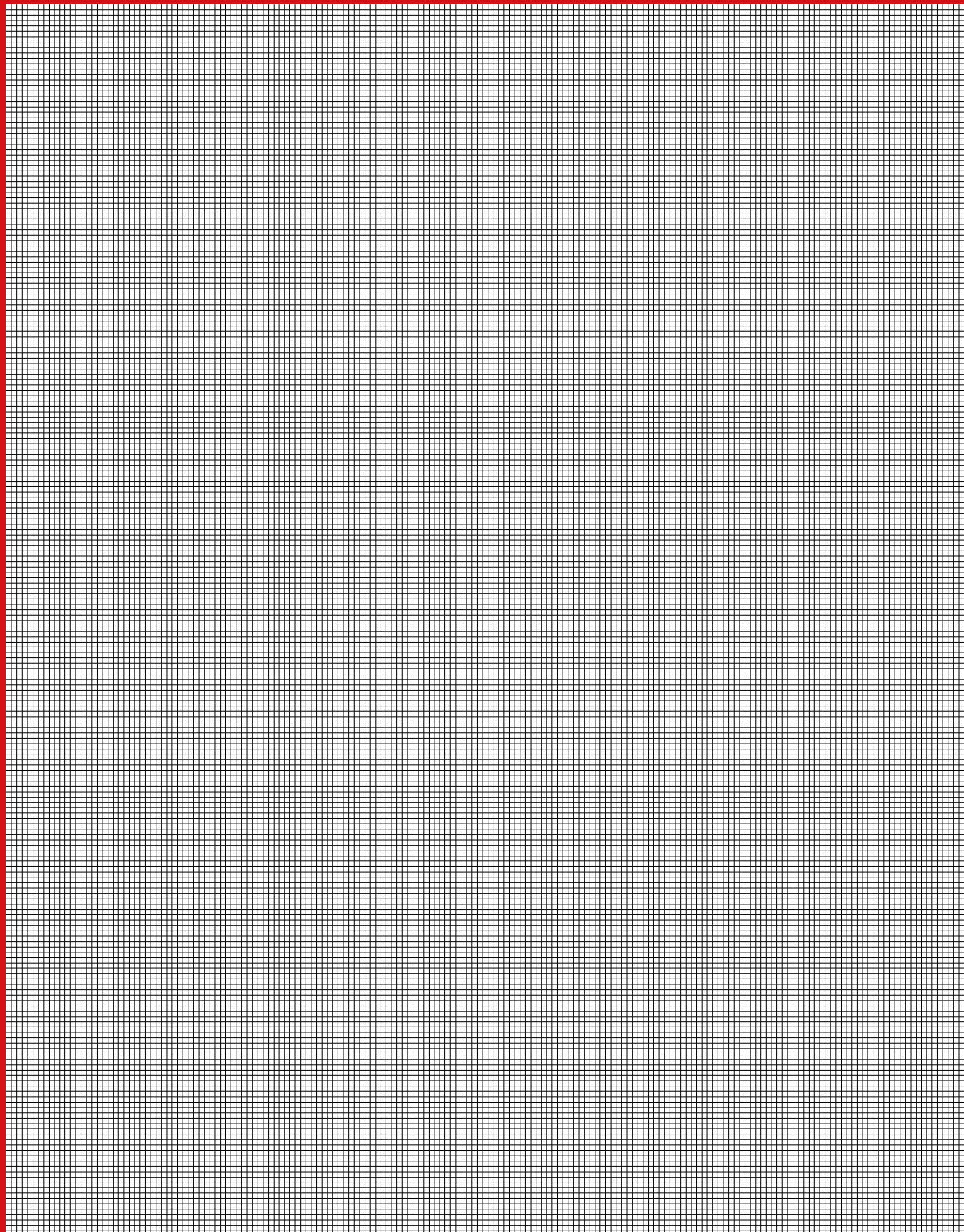
**For more information see**

*Per maggiori informazioni visita il sito*

Vous trouverez de plus amples informations sur



[www.arno.de](http://www.arno.de)



# EXTERNAL MACHINING

## External machining

## Lavorazione esterna

## Usinage extérieur

|  |  |  |           |
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| • System presentation                                | • <i>Presentazione del sistema</i>                         | • Présentation du système  | 32 – 37   |
| • ISO designation system for tool holders            | • <i>Sistema di identificazione ISO per utensili</i>       | • Système de désignation ISO pour supports de serrage                          | 38 – 39   |
| • Overview of tool holders                           | • <i>Panoramica utensili</i>                               | • Aperçu porte-outils  | 40 – 43   |
| • Holders with top clamping                          | • <i>Utensili con bloccaggio a staffa</i>                  | • Support de serrage avec serrage par bride                                    | 44 – 54   |
| • Holders with lever lock clamping                   | • <i>Utensili con bloccaggio a leva</i>                    | • Support de serrage avec serrage par levier à genouillère                     | 55 – 70   |
| • Holders with screw clamping                        | • <i>Utensili con bloccaggio a vite</i>                    | • Supports de serrage avec serrage par vis                                     | 71 – 103  |
| • ISO holder IK-UN with lever lock clamping on KMH01 | • <i>Utensili ISO IK-UN con bloccaggio a leva su KMH01</i> | • Support de serrage ISO IK-UN avec serrage par levier à genouillère sur KMH01 | 104 – 107 |
| • ISO holder IK-UN with screw clamping on KMH01      | • <i>Utensili ISO IK-UN con bloccaggio a vite su KMH01</i> | • Support de serrage ISO IK-UN avec serrage par vis sur KMH01                  | 108 – 111 |
| • Basic holders - INDEX/TRAUB                        | • <i>Supporto di base - INDEX / TRAUB</i>                  | • Support de base – INDEX/TRAUB  | 112       |
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# 1

# SELECTED TO LAST.

Diversity, high quality and precision: Tool holders from 8x8 to 32x32 mm.

This is where you're assured to find the right KMH tool holders to meet your requirements: with or without through tool cooling, for almost every machine type, with a variety of clamping systems and approach angles, in many sizes and with different coolant connection positions. For all products marked ARNO SpecialDesign. We also offer custom holders.

But whatever product you choose, one thing remains the same: quality. All ARNO holders are completely nickel-plated and consist of high-grade materials that have a high tensile strength and which are carefully manufactured. That's what makes them extremely rugged and durable. At the same time, the service life of indexable inserts is significantly increased by the rigid high-precision insert seat. Markings permit easy installation of holders with through tool cooling to guarantee reproducible processes and optimised chip flow.



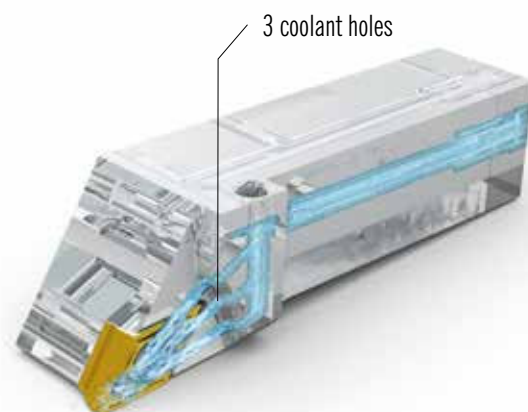
## MULTIPLE BENEFITS

of ARNO tool holders

Wide range – to fit almost every machine and requirement

Manufactured nickel-plated, with high tensile strength and precision – top quality guarantees long service life

Process reliability since holders with through tool cooling are easy to install



### Cooling – efficiently cool the cutting edge

Three precisely aligned coolant holes efficiently cool the flute. This optimises chip control and prolong tool life.

## KMH tool holders

- Available for almost every machine type
- Available with or without through tool cooling
- Compatible with SA and SE grooving systems – also with ACS Cooling System



## Flexible down to the smallest detail

- Variety of clamping systems
- Available with or without through tool cooling
- Holders from 8 x 8 to 32 x 32 mm
- Wide range of approach angles
- ARNO SpecialDesign: the simple, practical adjustment of length and coolant supply

## Quality and convenience

- Completely nickel-plated for long tool life and precision
- Scaling for length adjustment
- Special for Swiss type turning: simple and fast tool change with AFC – ARNO Fast Change holders. Go to [www.arno.de/langdrehen](http://www.arno.de/langdrehen) for more details

## Indexable inserts

- From roughing to fine finishing
- The right insert for all material types
- Variety of geometries and grades for every application
- Largest portfolio of high-positive indexable inserts in the world.

# SCELTI PER RESISTERE.

Versatilità, qualità elevata e precisione: utensili da 8x8 a 32x32 mm.

In questa sezione sono raccolti tutti i portautensili KMH e gli steli per qualsiasi esigenza: con o senza adduzione interna del refrigerante, per quasi ogni tipo di macchina, con diversi sistemi di bloccaggio e angoli di attacco, in diverse misure e con attacco refrigerante posizionabile in modo variabile per tutti i prodotti contrassegnati con ARNO SpecialDesign. Possiamo creare anche adattatori speciali.

Qualsiasi scelta venga operata una cosa rimane sempre uguale: la qualità. Tutti gli utensili ARNO sono completamente nichelati e realizzati in materiali pregiati, estremamente resistenti alla trazione e sottoposti a lavorazione accurata. Per questo sono particolarmente robusti e garantiscono una lunga durata. Allo stesso tempo, grazie alla sede dell'inserto precisa e stabile, aumenta notevolmente la durata degli inserti. Le marcature facilitano il montaggio dei supporti con adduzione interna del refrigerante, garantendo processi costanti e un controllo trucioli ottimale.



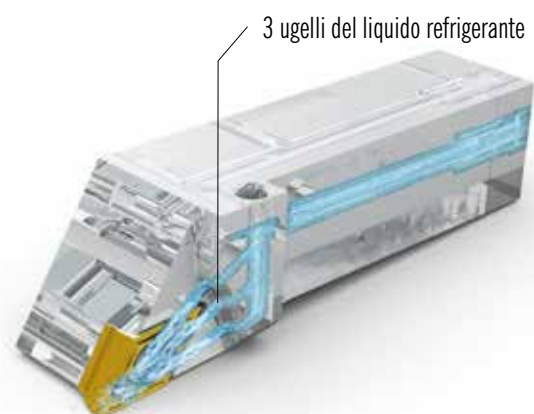
## VANTAGGI VERSATILI

degli utensili ARNO

Un'ampia gamma adatta a quasi tutte le macchine e le esigenze

Nichelati, resistenti alla trazione, lavorati con massima precisione – l'ottima qualità garantisce una lunga durata.

Sicurezza di processo grazie al montaggio semplice dell'utensile con adduzione interna del refrigerante



### Raffreddamento - sempre forte, sempre preciso

Grazie agli ugelli orientati con precisione il tagliente viene raffreddato efficacemente, e grazie a questo il controllo della truciolatura viene ottimizzato e la durata aumentata.

## Portautensili KMH

- Disponibili praticamente per tutti i tipi di macchine
- Disponibili con e senza adduzione interna refrigerante
- Compatibile con i sistemi di scanalatura SA e SE - anche con ACS-Cooling-System



## Flessibile fino all'ultimo dettaglio

- Diversi sistemi di serraggio e bloccaggio inserto
- Disponibili con e senza adduzione interna refrigerante
- Misure da 8 x 8 a 32 x 32 mm
- Diversi angoli di registrazione
- ARNO SpecialDesign: pratico per adattare la lunghezza dell'accesso al refrigerante in modo semplice

## Qualità & Comfort

- Completamente nichelati per garantire la massima durata e precisione
- Dotati di possibilità di riposizionamento per consentire la regolazione della lunghezza
- Studiati appositamente per la tornitura su fantina mobile: cambio utensile più semplice e rapido con i supporti AFC – ARNO Fast Change. Ulteriori informazioni sono disponibili su [www.arno.de/langdrehen](http://www.arno.de/langdrehen)

## Inserti

- Dalla sgrossatura alla finitura più fine
- Il tagliente adatto per tutti i tipi di materiali
- Diverse geometrie e qualità per ogni applicazione
- La più ampia gamma di inserti altamente positivi in tutto il mondo.



# QUAND LE CHOIX RENCONTRE L'ENDURANCE.

Diversité, qualité élevée et précision d'adaptation : supports de serrage de 8x8 à 32x32 mm.

Vous trouverez ici les supports KMH et supports de serrage adaptés à vos exigences : avec ou sans refroidissement interne, pour presque tous les types de machines, avec différents systèmes de fixation et angles d'attaque, dans de nombreuses dimensions et avec raccord du liquide de refroidissement à positionnement variable pour tous les produits marqués « ARNO SpecialDesign ». Des supports spéciaux sont aussi possibles chez nous.

Un critère reste toujours le même parmi tout ce choix : la qualité. Tous les supports ARNO sont complètement nickelés et se composent d'un matériau de haute qualité, extrêmement résistant à la traction et transformé avec soin. Ils sont ainsi particulièrement robustes et durables. En même temps, le logement de plaquette précis et stable combiné permet d'augmenter considérablement la durée de vie des plaquettes de coupe amovibles. Des marquages facilitent le montage des supports avec refroidissement interne, garantissant ainsi des processus reproductibles et une évacuation optimale des copeaux.



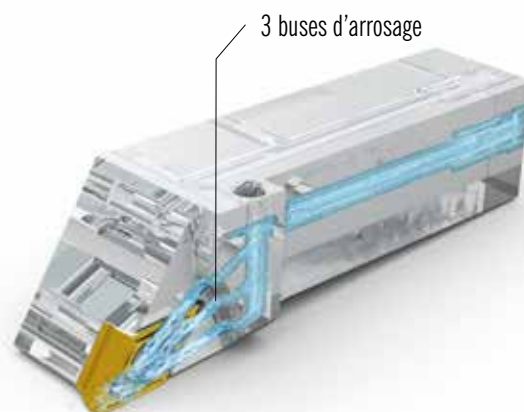
## AVANTAGES MULTIPLES

### des supports de serrage ARNO

Vaste gamme de produits adaptés à presque chaque type de machine et exigence

Nickelés, résistants à la traction, transformés avec précision : la meilleure qualité garantit une longue vie

Sécurité de processus grâce à un montage simple des supports avec refroidissement interne



### Refroidissement – toujours puissant, toujours précis

Trois buses d'arrosage alignées avec précision permettent de refroidir efficacement l'arête de coupe, ce qui optimise le contrôle des copeaux et augmente la durée de vie.

## Supports d'outils KMH

- Disponibles pour presque tous les types de machines
- Avec et sans refroidissement interne
- Compatibles avec les systèmes de tronçonnage/usinage de gorges SA et SE – aussi avec système de refroidissement ACS



## De la flexibilité jusque dans les moindres détails

- Différents systèmes de serrage et de fixation
- Disponible avec et sans refroidissement interne
- Dimensions de 8 x 8 à 32 x 32 mm
- Angles d'attaque les plus divers
- ARNO SpecialDesign : pratique pour l'ajustement simple de la longueur et de l'accès au liquide de refroidissement

## Qualité et confort

- Complètement nickelés pour longue durée de vie et précision
- Mise à l'échelle pour le réglage de la longueur
- Spécialement conçu pour le décolletage : changement d'outils simple et rapide avec les supports AFC – ARNO Fast-Change. Plus d'infos à ce sujet sur [www.arno.de/langdrehen](http://www.arno.de/langdrehen)

## Plaquettes de coupe amovibles

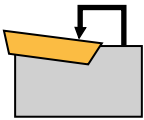
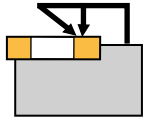
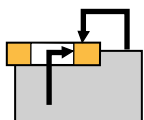
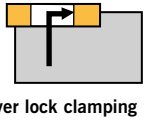
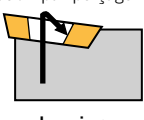
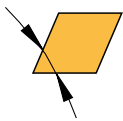

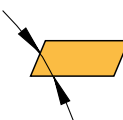









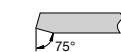
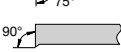


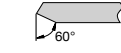


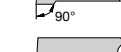
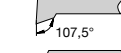
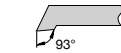
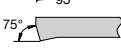

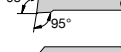
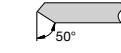
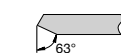
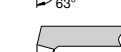
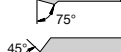

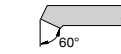
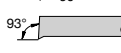

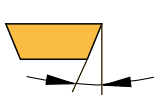
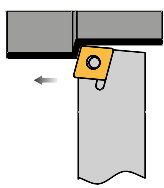
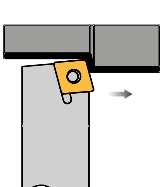
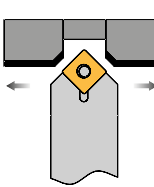
- De l'ébauche jusqu'à la finition
- La bonne plaquette pour tous les types de matériaux
- Différentes géométries et formes pour chaque application
- Plus grand choix au monde de plaquettes de coupe amovibles hautement positives

# System presentation

Presentazione del sistema

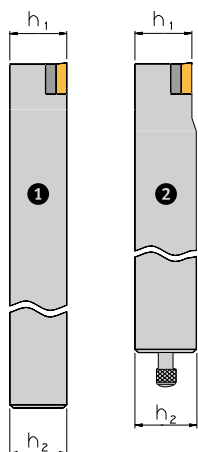
Présentation du système

## ISO DESIGNATION SYSTEM FOR TOOL HOLDERS SISTEMA DI IDENTIFICAZIONE ISO PER UTENSILI SYSTÈME DE DÉSIGNATION ISO POUR SUPPORTS DE SERRAGE

| <b>P</b>   | <b>C</b>   | <b>L</b>  | <b>N</b>  | <b>L</b>   |
|--|--|---|---|--|
| CLAMPING METHOD<br>SISTEMA DI BLOCCAGGIO<br>SYSTÈME DE FIXATION  | INSERT SHAPE<br>FORMA INSERTO<br>FORME DE PLAQUETTE  | APPROACH ANGLE<br>FORMA UTENSILE<br>ANGLE D'ATTAQUE   | CLEARANCE ANGLE<br>ANGOLI DI SPOGLIA<br>INFERIORI<br>ANGLE DE DÉPOUILLE   | HOLDER DESIGN<br>VERSIONE DEL SUPPORTO<br>SENS DE LA COUPE   |
|  <p><b>C</b></p> <p><b>Top clamping</b><br/><i>Bloccato dall'alto</i><br/>Fixation par le haut</p>  <p><b>D</b></p> <p><b>Top and hole clamping</b><br/><i>Bloccaggio combinato da sopra</i><br/>Fixation par le haut et par perçage</p>  <p><b>M</b></p> <p><b>Top and hole clamping</b><br/><i>Bloccaggio combinato da sopra</i><br/>Fixation par le haut et par perçage</p>  <p><b>P</b></p> <p><b>Lever lock clamping</b><br/><i>Bloccaggio a leva</i><br/>Fixation par perçage</p>  <p><b>S</b></p> <p><b>Screw clamping</b><br/><i>Bloccaggio a vite</i><br/>Par vissage dans trou</p> |  <p>80° <b>C</b></p>  <p>55° <b>D</b></p> <p>75° <b>E</b></p> <p>86° <b>M</b></p> <p>35° <b>V</b></p>  <p>85° <b>A</b></p> <p>82° <b>B</b></p> <p>55° <b>K</b></p>  <p><b>H</b></p>  <p><b>L</b></p>  <p><b>O</b></p>  <p><b>P</b></p>  <p><b>R</b></p>  <p><b>S</b></p>  <p><b>T</b></p>  <p><b>W</b></p> |  <p>90° <b>A</b></p>  <p>75° <b>B</b></p>  <p>90° <b>C</b></p>  <p>45° <b>D</b></p>  <p>60° <b>E</b></p>  <p>90° <b>F</b></p>  <p>90° <b>G</b></p>  <p>90° <b>H</b></p>  <p>107,5° <b>J</b></p>  <p>93° <b>K</b></p>  <p>75° <b>L</b></p>  <p>95° <b>L</b></p>  <p>95° <b>M</b></p>  <p>50° <b>N</b></p>  <p>63° <b>N</b></p>  <p>75° <b>R</b></p>  <p>45° <b>S</b></p>  <p>60° <b>T</b></p>  <p>93° <b>U</b></p>  <p>72,5° <b>V</b></p>  <p>60° <b>W</b></p>  <p>85° <b>Y</b></p> |  <p>3° <b>A</b></p> <p>5° <b>B</b></p> <p>7° <b>C</b></p> <p>15° <b>D</b></p> <p>20° <b>E</b></p> <p>25° <b>F</b></p> <p>30° <b>G</b></p> <p>0° <b>N</b></p> <p>11° <b>P</b></p> <p><b>Others</b> → <b>O</b><br/><i>Altri</i><br/><i>Autres</i></p> | <p><b>R</b></p>  <p><b>L</b></p>  <p><b>N</b></p>  |

20

SHANK HEIGHT  
ALTEZZA DELLO STELO  
HAUTEUR DE TIGE



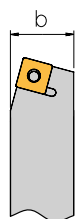
Cutting edge height "h1" in mm. With tool holders ① the cutting edge height is equal to "h1"; with short tool holders (cartridges) the shank height ② is generally unequal to "h2".

Altezza della punta dell'inserto "h1" in mm. Negli utensili ① l'altezza delle punte dell'inserto "h1" è uguale e nelle cartucce ② di solito è diversa dall'altezza dello stelo "h2".

Hauteur de coupe «h1» en mm. Avec porte-outils ① la coupe la hauteur de coupe est égale à «h1»; avec porte-outils courts (cartouches) la hauteur du corps ② est généralement différente de «h2».

20

SHANK WIDTH  
LARGHEZZA DELLO STELO  
LARGEUR DU CORPS



Shank width "b" in mm. The shank width is omitted for cartridges. It is replaced by the letters "CA".

Larghezza dello stelo "b" in mm. Nelle cartucce non viene indicata la larghezza dello stelo. Viene sostituita con la sigla "CA".

Largueur du corps "b" en mm. La largeur du corps est omise pour cartouches. Il est remplacé par les lettres «CA».

K

HOLDER LENGTH  
LUNGHEZZA DELLO STELO  
LONGUEUR DE SUPPORT

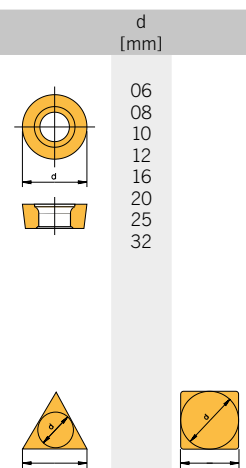


|   | l <sub>1</sub><br>[mm] | l <sub>1</sub><br>[mm] |
|---|------------------------|------------------------|
| A | 32                     | M 150                  |
| B | 40                     | N 160                  |
| C | 50                     | P 170                  |
| D | 60                     | Q 180                  |
| E | 70                     | R 200                  |
| F | 80                     | S 250                  |
| G | 90                     | T 300                  |
| H | 100                    | U 350                  |
| J | 110                    | V 400                  |
| K | 125                    | W 450                  |
| L | 140                    | Y 500                  |

Special length → X  
Lunghezza speciale  
Longueur spéciale

12

EDGE LENGTH  
LUNGHEZZA DEL BORDO  
LONGUEUR D'ARÊTE DE  
COUPE



|      |        | d<br>[mm] |      |
|------|--------|-----------|------|
| [mm] | [inch] | [mm]      | [mm] |
| 06   | 5/32   | 3,97      | 03   |
| 08   | 3/16   | 4,76      | 04   |
| 09   | 7/32   | 5,56      | 05   |
| 11   | 1/4    | 6,35      | 06   |
| 16   | 3/8    | 9,525     | 09   |
| 22   | 1/2    | 12,7      | 12   |
| 27   | 5/8    | 15,875    | 15   |
| 33   | 3/4    | 19,05     | 19   |
| 44   | 1      | 25,4      | 25   |

...

ADDITIONAL CODING  
INFORMAZIONI  
SUPPLEMENTARI  
INFORMATION  
COMPLÉMENTAIRE

Special product features are indicated by an internal company code at digit 10.

Per particolari caratteristiche del prodotto al 10° posto può essere inserito un codice interno della ditta.

Pour les caractéristiques spécifiques de produit, un code interne à l'entreprise peut être indiqué au 10e emplacement.

# TOP CLAMPING

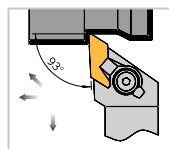
## BLOCCAGGIO A STAFFA

### SERRAGE PAR VIS

#### Top Clamping – negative

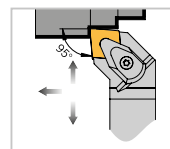
*Bloccaggio a staffa – negativo*

Serrage par vis - positif



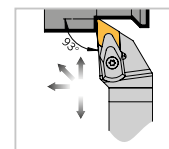
**CKJN**  
**L/R**

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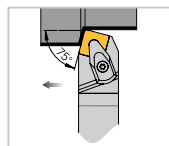
**DCLN**  
**L/R**

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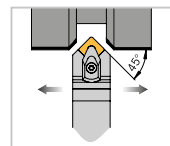
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**L/R**

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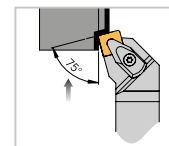
**DSBN**  
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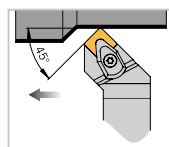
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**N**

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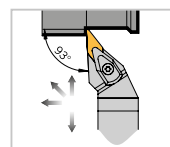
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**L/R**

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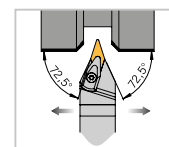
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**L/R**

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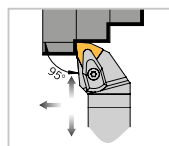
**DVJN**  
**L/R**

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**DVVN**  
**N**

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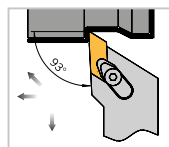
**DWLN**  
**L/R**

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#### Top Clamping – positive

*Bloccaggio da sopra – positivi*

Serrage par bride – positif



**CKJC**  
**L/R**

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# LEVER LOCK CLAMPING

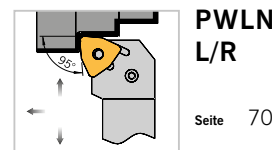
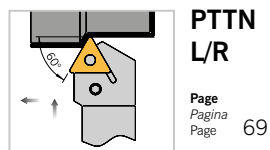
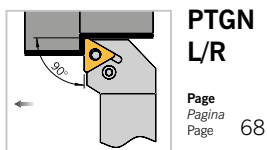
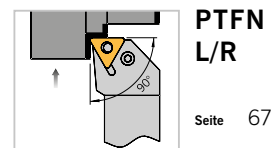
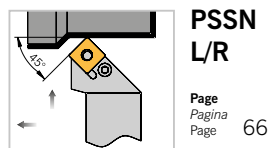
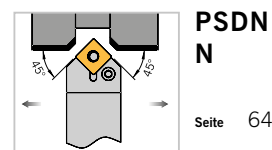
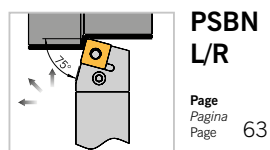
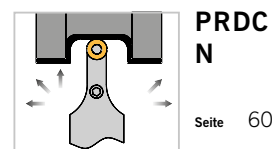
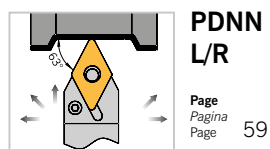
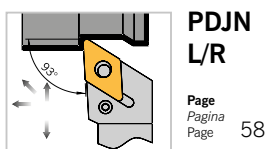
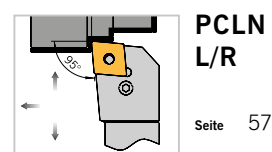
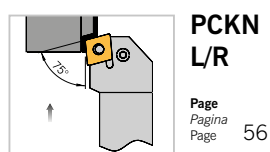
## BLOCCAGGIO A LEVA

## SERRAGE PAR LEVIER À GENOUILLÈRE

### Lever Lock Clamping – negative

*Bloccaggio a leva – negativi*

Serrage par levier à genouillère – négatif



### Lever Lock Clamping – positive

*Bloccaggio a leva – positivi*

Serrage par levier à genouillère – positif



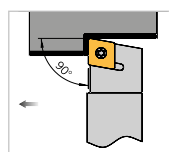


# SCREW CLAMPING

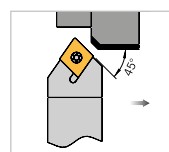
## BLOCCAGGIO A VITE

### SERRAGE PAR VIS

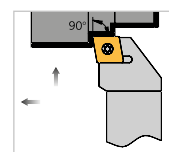
**Screw Clamping – positive**  
*Bloccaggio a vite – positivi*  
Serrage par vis - positif



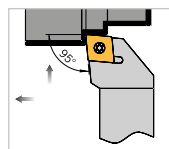
**SCAC  
L/R**  
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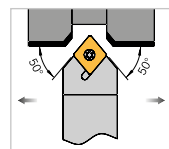
**SCDC  
L**  
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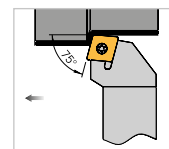
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L/R**  
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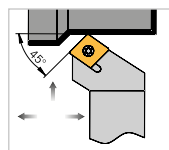
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L/R**  
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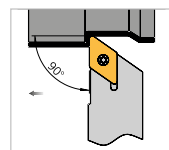
**SMCN**  
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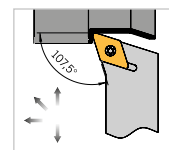
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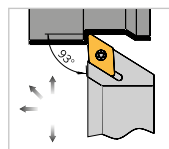
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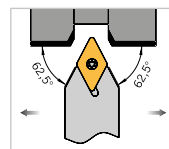
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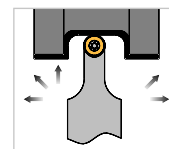
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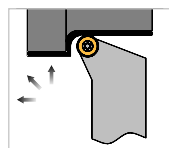
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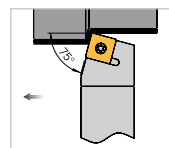
**SDNC  
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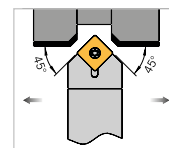
**SRDC  
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**SRGC  
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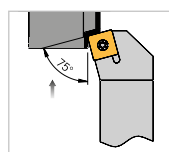


**SSBC  
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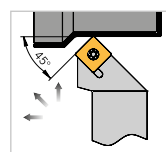


**SSDC  
N**  
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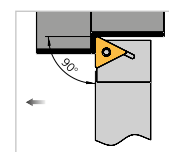
**Screw Clamping – positive**  
*Bloccaggio a vite – positivi*  
 Serrage par vis – positif



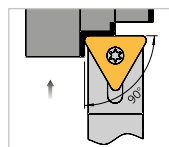
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**L/R**  
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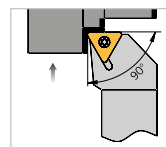
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**L/R**  
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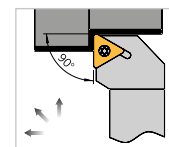
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**L/R**  
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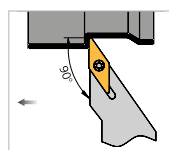
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**N**  
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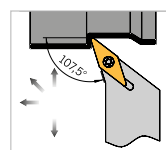
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**L/R**  
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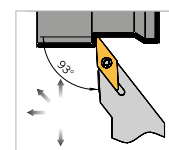
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**L/R**  
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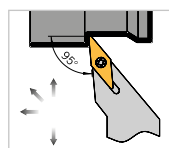
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**L/R**  
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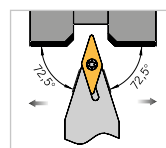
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**L/R**  
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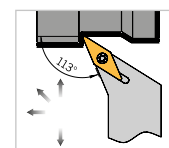
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**L/R**  
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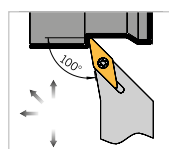
**SVLC**  
**L/R**  
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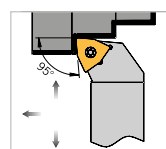
**SVVC**  
**N**  
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**SVXC**  
**L/R**  
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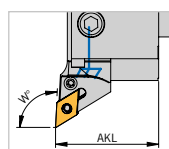


**SVZC**  
**L/R**  
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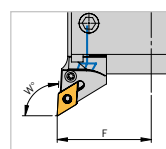


**SWLC**  
**L/R**  
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**ISO tool holder IK-UN with lever lock clamping on KMH01**  
*Adattatore ISO IK-UN con bloccaggio a leva su KMH01*  
 Serrage par levier à genouillère – positif

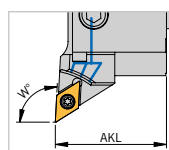


**Style B**  
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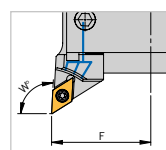


**Style C**  
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**ISO tool holder IK-UN with screw clamping on KMH01**  
*Adattatore ISO IK-UN con bloccaggio a vite su KMH01*  
 Support de serrage ISO IK-UN avec serrage par vis sur KMH01



**Style B**  
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**Style C**  
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**Torque screwdriver kit**  
*Set chiavi dinamometriche*  
 Kit de tournevis dynamométriques

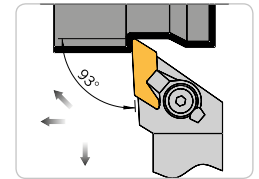
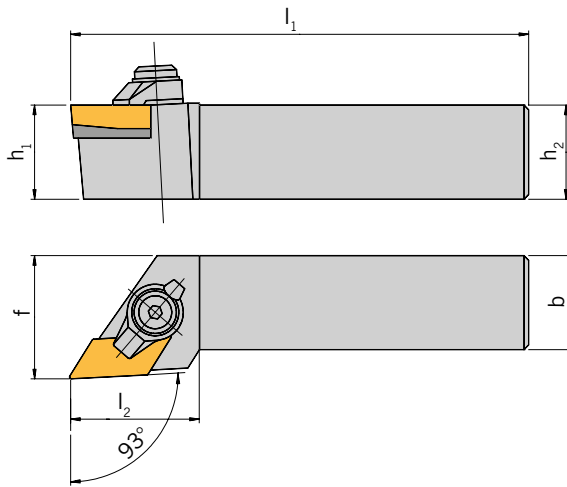


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**CKJN L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

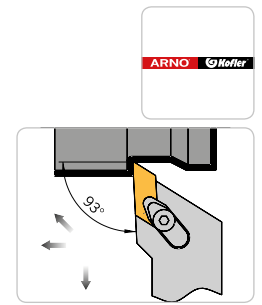
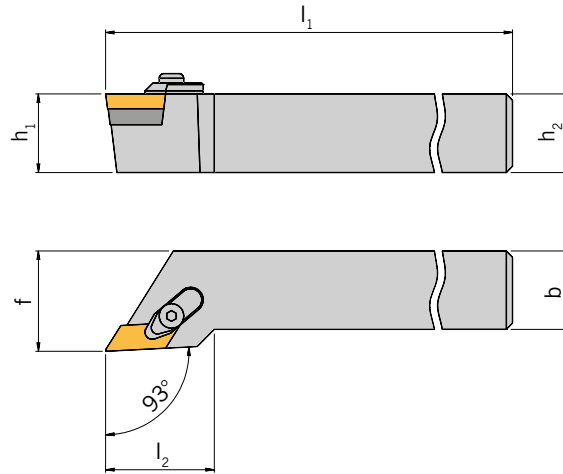
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| CKJNL/R 2525 M16                   | 25          | 25  | 150   | 35    | 32  | KNUX 1604...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Spring and pin<br>Molla e perno<br>Ressort et goujon | Clamp<br>Staffa<br>Support | Screw<br>Vite<br>Vis | Spring<br>Molla<br>Ressort | Support pad<br>Supporto<br>Cale-support | Pin<br>Spina<br>Clou cannelé | Key<br>Chiave<br>Clé |
|-----------------------------------|--|----------------------------|----------------------|----------------------------|---|------------------------------|----------------------|
| CKJN L/R.. 16                     | 70.5-841   | 70.5-824                   | 70.5-865             | 70.5-848                   | U000051L                                | 7480901                      | KP 1321              |

**CKJC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| CKJCL/R 1616 H11                   | 16          | 16  | 100   | 22    | 20  | KCGX 1103...                |
| CKJCL/R 2020 K11                   | 20          | 20  | 125   | 22    | 25  | KCGX 1103...                |
| CKJCL/R 2525 M11                   | 25          | 25  | 150   | 22    | 32  | KCGX 1103...                |

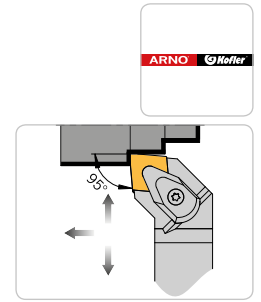
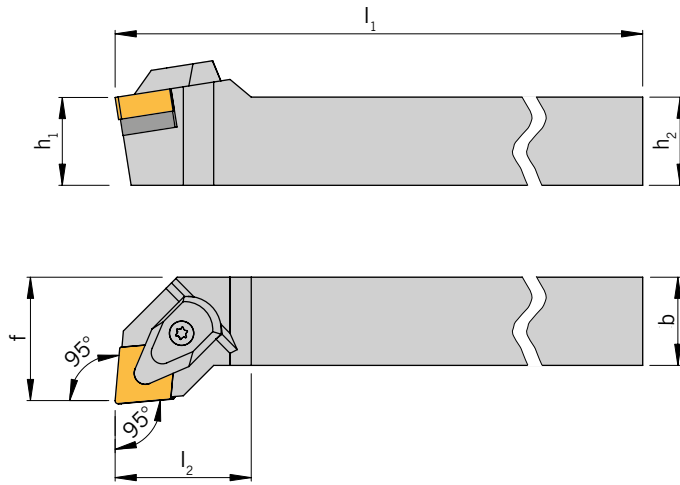
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp<br>Staffa<br>Support | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------------|----------------------|---|---|----------------------|
| CKJC L/R.. 11                     | KL11                       | S11                  | UPL11L                                  | UPS   | KS 2520              |

**DCLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

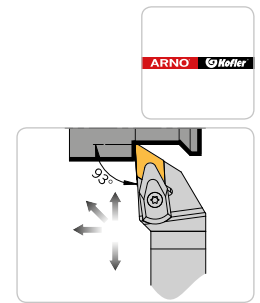
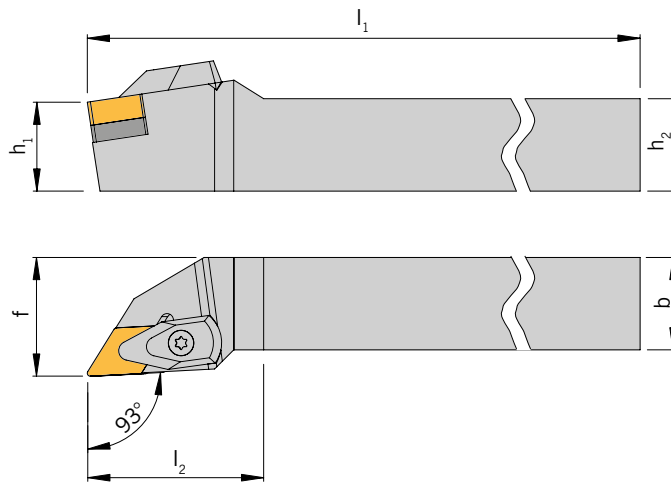
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| DCLNL/R 2020 K12-A                 | 20          | 20  | 125   | 32    | 25  | CN.. 1204...                |
| DCLNL/R 2525 M12-A                 | 25          | 25  | 150   | 32    | 32  | CN.. 1204...                |
| DCLNL/R 2525 M16-A                 | 25          | 25  | 150   | 38    | 32  | CN.. 1606...                |
| DCLNL/R 3225 P12-A                 | 32          | 25  | 170   | 32    | 32  | CN.. 1204...                |
| DCLNL/R 3232 P16-A                 | 32          | 32  | 170   | 36    | 40  | CN.. 1606...                |
| DCLNL/R 3232 P19-A                 | 32          | 32  | 170   | 42    | 40  | CN.. 1906...                |
| DCLNL/R 4040 S19-A                 | 40          | 40  | 250   | 42    | 50  | CN.. 1906...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DC.. L/R.. 12-A                   | KD2201   | U-CN12T3-D                              | M4,5X10-T15   | KS 1111              |
| DC.. L/R.. 16-A                   | KD4420   | U-CN1604-D                              | M5,0X14-T20   | KS 2520              |
| DC.. L/R.. 19-A                   | KD5530   | U-CN1905-D                              | M5,0X14-T20   | KS 2520              |

## DDJN L/R

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|----------------------------|
| DDJNL/R 2020 K11-A                 | 20          | 20 | 125   | 35    | 25 | DN.. 1104...               |
| DDJNL/R 2020 K15-A                 | 20          | 20 | 125   | 40    | 25 | DN.. 1506...               |
| DDJNL/R 2525 M11-A                 | 25          | 25 | 150   | 35    | 32 | DN.. 1104...               |
| DDJNL/R 2525 M15-A                 | 25          | 25 | 150   | 40    | 32 | DN.. 1506...               |
| DDJNL/R 3225 P15-A                 | 32          | 25 | 170   | 40    | 32 | DN.. 1506...               |

### Spare Parts / Ricambi / Pièces de rechange

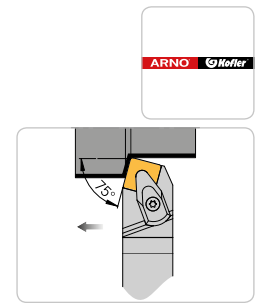
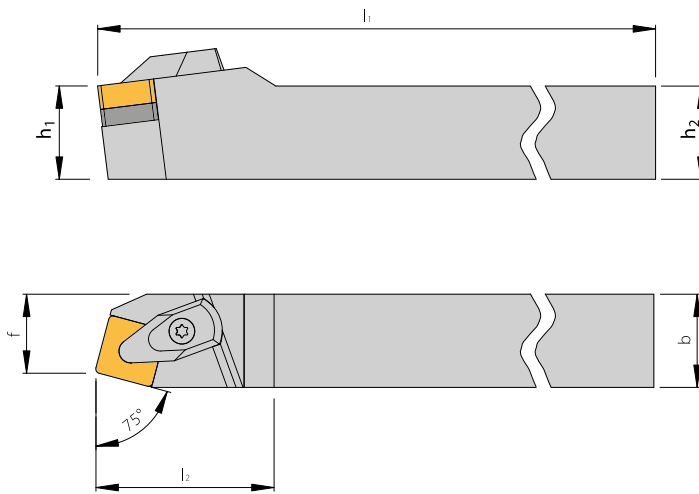
| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DD.. L/R.. 11-A                   | KD1105   | U-DN1103-D                              | M3,0X7-T09  | KS 2309              |
| DD.. L/R.. 15-A                   | KD2201   | U-DN15T3-D                              | M4,5X10-T15   | KS 1111              |



**DSBN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

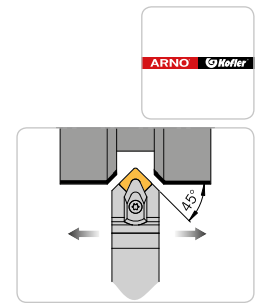
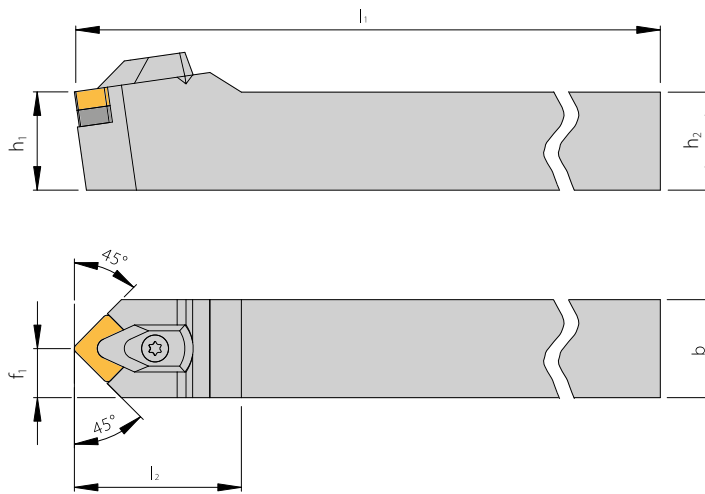
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| DSBNL/R 2020 K12-A                 | 20          | 20  | 125   | 35    | 17  | SN.. 1204...                |
| DSBNL/R 2525 M12-A                 | 25          | 25  | 150   | 35    | 22  | SN.. 1204...                |
| DSBNL/R 2525 M15-A                 | 25          | 25  | 150   | 42    | 22  | SN.. 1506...                |
| DSBNL/R 3232 P15-A                 | 32          | 32  | 170   | 42    | 27  | SN.. 1506...                |
| DSBNL/R 3232 P19-A                 | 32          | 32  | 170   | 48    | 27  | SN.. 1906...                |
| DSBNL/R 4040 S19-A                 | 40          | 40  | 250   | 48    | 35  | SN.. 1906...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DS.. L/R.. 12-A                   | KD2201   | U-SN12T3-D                              | M4,5X10-T15   | KS 1111              |
| DS.. L/R.. 15-A                   | KD4420   | U-SN1506-D                              | M5,0X14-T20   | KS 2520              |
| DS.. L/R.. 19-A                   | KD5530   | U-SN1905-D                              | M5,0X14-T20   | KS 2520              |

**DSDN N**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|----------------------------|
| DSDNN 2020 K12-A                   | 20          | 20  | 125   | 38    | 10,0  | SN.. 1204...               |
| DSDNN 2525 M12-A                   | 25          | 25  | 150   | 38    | 12,5  | SN.. 1204...               |

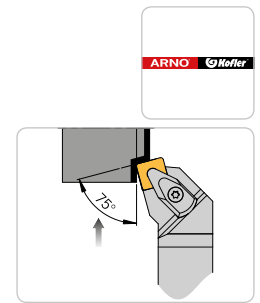
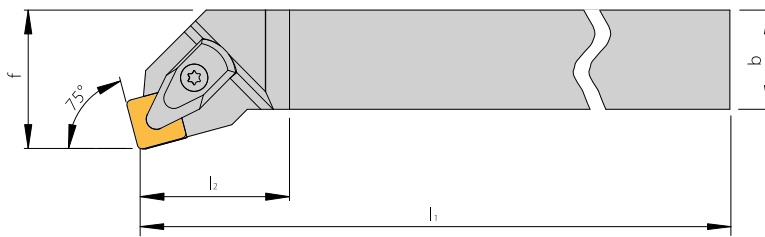
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DS.. N.. 12-A                     | KD2201   | U-SN12T3-D                              | M4,5X10-T15   | KS 1111              |

**DSKN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

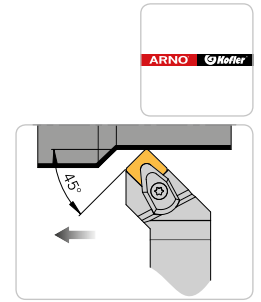
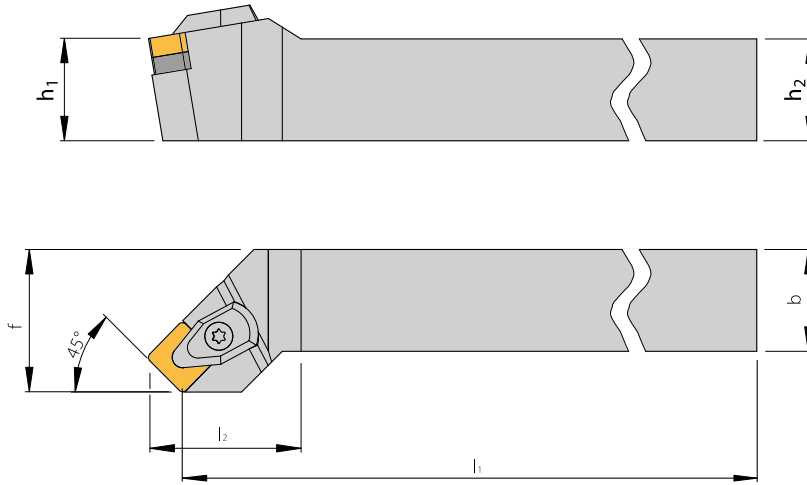
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| DSKNL/R 2525 M12-A                 | 25          | 25  | 150   | 28    | 32  | SN.. 1204...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DS.. L/R.. 12-A                   | KD2201   | U-SN12T3-D                              | M4,5X10-T15   | KS 1111              |

**DSSN L/R**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| DSSNL/R 2020 K12-A                 | 20          | 20  | 125   | 35    | 25  | SN.. 1204...               |
| DSSNL/R 2525 M12-A                 | 25          | 25  | 150   | 35    | 32  | SN.. 1204...               |
| DSSNL/R 3225 P12-A                 | 32          | 25  | 170   | 35    | 32  | SN.. 1204...               |

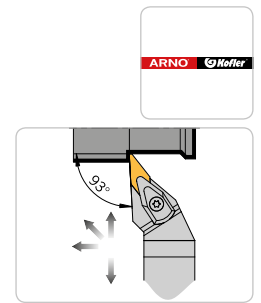
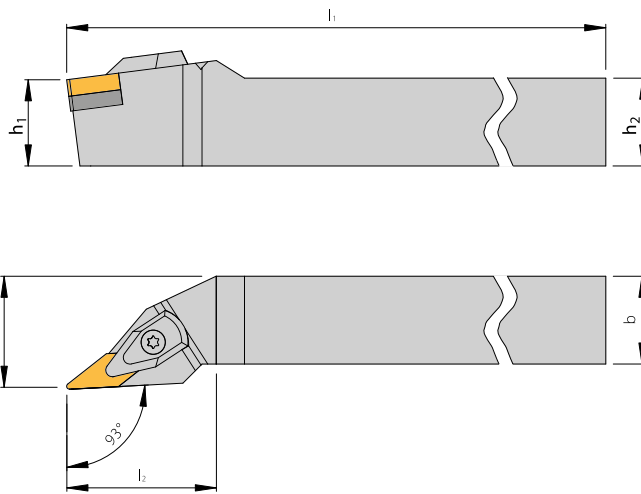
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DS.. L/R.. 12-A                   | KD2201   | U-SN12T3-D                              | M4,5X10-T15   | KS 1111              |

**DVJN L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

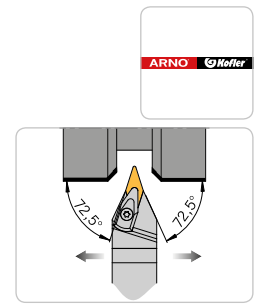
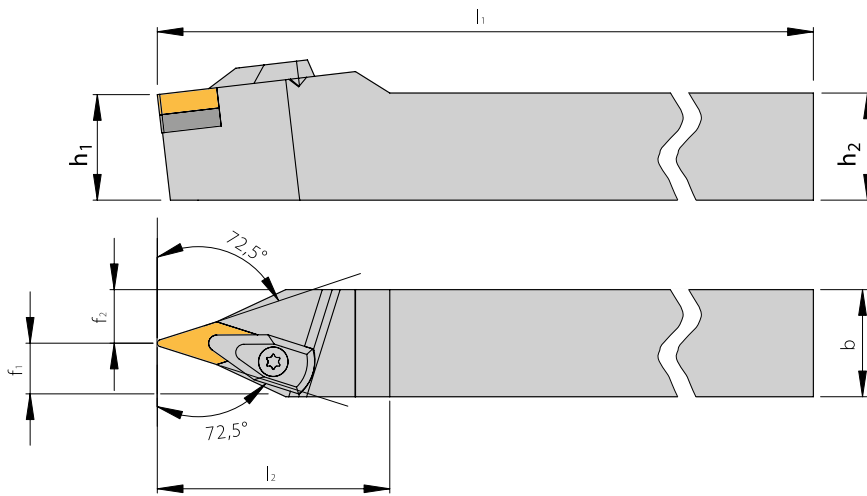
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| DVJNL/R 2020 K16-A                 | 20          | 20  | 125   | 39    | 25  | VN.. 1604...               |
| DVJNL/R 2525 M16-A                 | 25          | 25  | 150   | 39    | 32  | VN.. 1604...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DV.. L/R.. 16-A                   | KD1105   | U-VN1603-D                              | M3,0X7-T09  | KS 2309              |

**DVNN N**

Approach angle 72,5° / Angolo di attacco 72,5° / Angle d'attaque 72,5°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | $f_2$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-------|----------------------------|
| DVNN 2020 K16-A                    | 20          | 20  | 125   | 43    | 12,5  | 7,5   | VN.. 1604...               |
| DVNN 2525 M16-A                    | 25          | 25  | 150   | 43    | 12,5  | 12,5  | VN.. 1604...               |

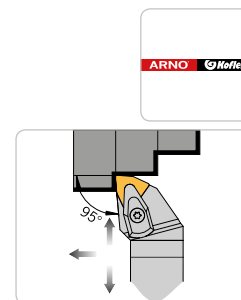
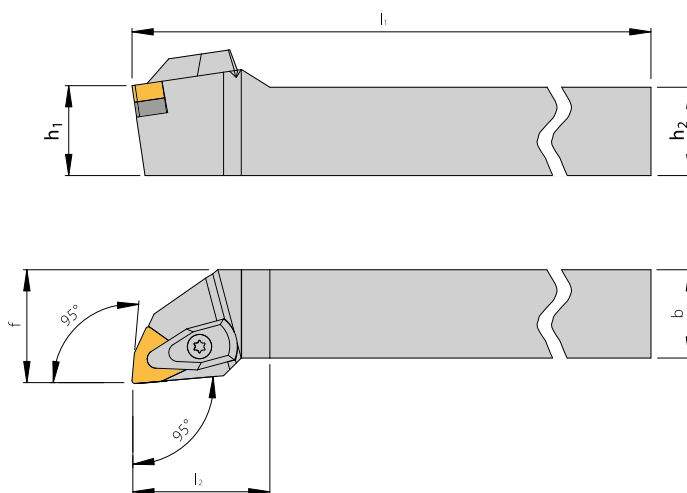
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DV.. N.. 16-A                     | KD1105   | U-VN1603-D                              | M3,0X7-T09  | KS 2309              |

**DWLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| DWLN L/R 2020 K06-A                | 20          | 20 | 125   | 27    | 25 | WN.. 0604...                |
| DWLN L/R 2020 K08-A                | 20          | 20 | 125   | 34    | 25 | WN.. 0804...                |
| DWLN L/R 2525 M06-A                | 25          | 25 | 150   | 27    | 32 | WN.. 0604...                |
| DWLN L/R 2525 M08-A                | 25          | 25 | 150   | 34    | 32 | WN.. 0804...                |

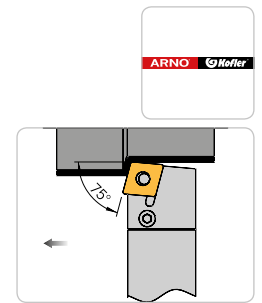
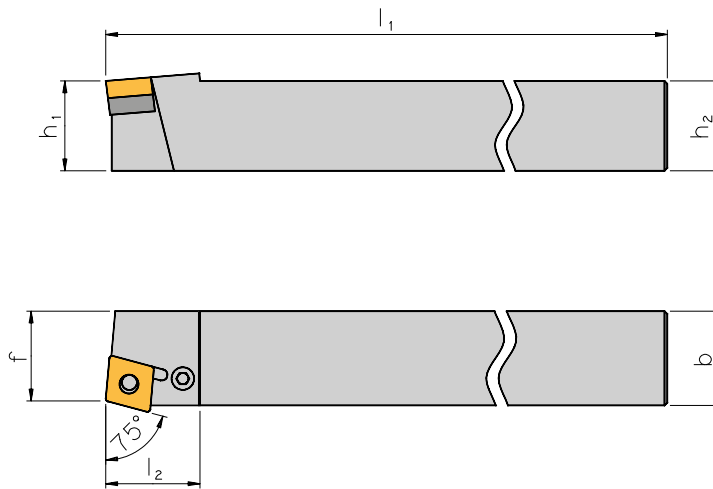
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per rondella<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|---|----------------------|
| DW.. L/R.. 06-A                   | KD1105   | U-WN0603-D                              | M3,0X7-T09  | KS 2309              |
| DW.. L/R.. 08-A                   | KD2201   | U-WN08T3-D                              | M4,5X10-T15   | KS 1111              |



**PCBN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PCBNL/R 2525 M12                   | 25          | 25  | 150   | 27,7  | 22  | CN.. 1204...                |
| PCBNL/R 2525 M16                   | 25          | 25  | 150   | 31,7  | 22  | CN.. 1606...                |
| PCBNL/R 3232 P19                   | 32          | 32  | 170   | 37,9  | 27  | CN.. 1906...                |

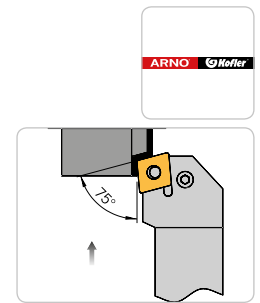
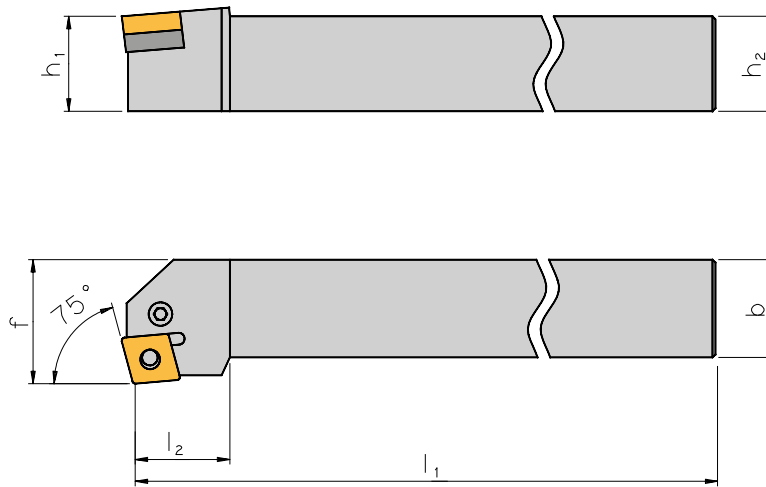
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PC.. L/R.. 12                     | UP 1111                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 1111   |
| PC.. L/R.. 16                     | UP 1221                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 1221   |
| PC.. L/R.. 19                     | UP 1321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 1321   |

**PCKN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

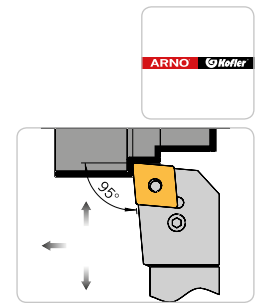
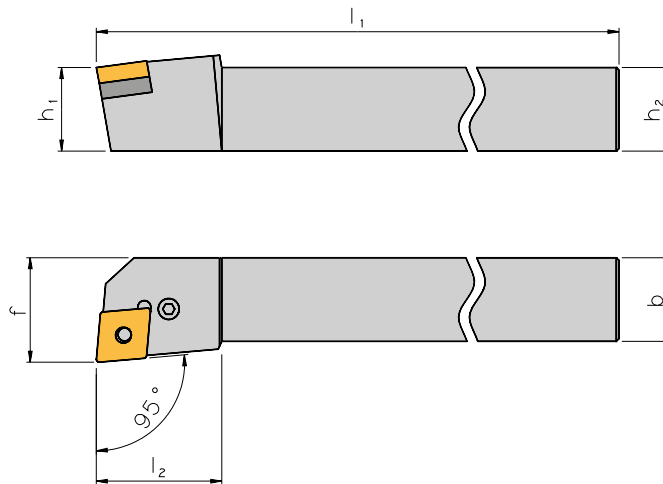
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| PCKNL/R 2020 K12                   | 20          | 20  | 125   | 27,4  | 25  | CN.. 1204...               |
| PCKNL/R 2525 M12                   | 25          | 25  | 150   | 28,0  | 32  | CN.. 1204...               |
| PCKNL/R 3232 P19                   | 32          | 32  | 170   | 36,0  | 40  | CN.. 1906...               |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PC.. L/R.. 12                     | UP 1111                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 1111   |
| PC.. L/R.. 19                     | UP 1321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 1321   |

**PCLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PCLNL/R 1616 H09                   | 16          | 16  | 100   | 23,0  | 20  | CN.. 0903...                |
| PCLNL/R 1616 H12                   | 16          | 16  | 100   | 26,1  | 20  | CN.. 1204...                |
| PCLNL/R 2020 K09                   | 20          | 20  | 125   | 25,0  | 25  | CN.. 0903...                |
| PCLNL/R 2020 K12                   | 20          | 20  | 125   | 27,4  | 25  | CN.. 1204...                |
| PCLNL/R 2525 M09                   | 25          | 25  | 150   | 28,0  | 32  | CN.. 0903...                |
| PCLNL/R 2525 M12                   | 25          | 25  | 150   | 28,0  | 32  | CN.. 1204...                |
| PCLNL/R 2525 M16                   | 25          | 25  | 150   | 28,0  | 32  | CN.. 1606...                |
| PCLNL/R 3225 P12                   | 32          | 25  | 170   | 32,6  | 32  | CN.. 1204...                |
| PCLNL/R 3232 P16                   | 32          | 32  | 170   | 32,6  | 40  | CN.. 1606...                |
| PCLNL/R 3232 P19                   | 32          | 32  | 170   | 38,0  | 40  | CN.. 1906...                |
| PCLNL/R 4040 S19                   | 40          | 40  | 250   | 38,0  | 50  | CN.. 1906...                |

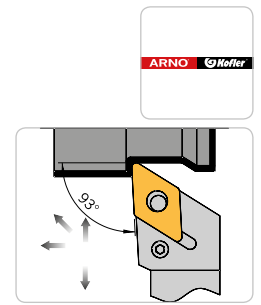
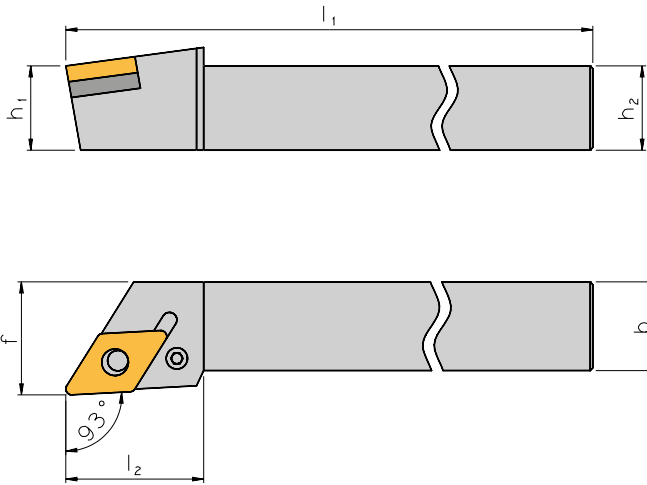
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PC.. L/R.. 09                     | UP 1115                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 1112   |
| PC.. L/R.. 12                     | UP 1111                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 1111   |
| PC.. L/R.. 16                     | UP 1221                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 1221   |
| PC.. L/R.. 19                     | UP 1321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 1321   |

**PDJN L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

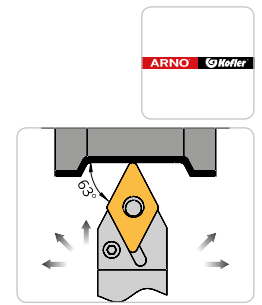
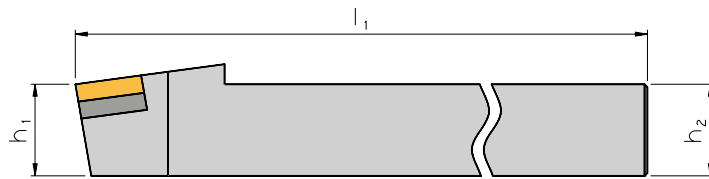
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PDJNL/R 1616 H11                   | 16          | 16  | 100   | 30,0  | 20  | DN.. 1104...                |
| PDJNL/R 2020 K11                   | 20          | 20  | 125   | 30,0  | 25  | DN.. 1104...                |
| PDJNL/R 2020 K15                   | 20          | 20  | 125   | 34,7  | 25  | DN.. 1506...                |
| PDJNL/R 2525 M11                   | 25          | 25  | 150   | 30,0  | 32  | DN.. 1104...                |
| PDJNL/R 2525 M15                   | 25          | 25  | 150   | 34,7  | 32  | DN.. 1506...                |
| PDJNL/R 3225 P11                   | 32          | 25  | 170   | 30,0  | 32  | DN.. 1104...                |
| PDJNL/R 3225 P15                   | 32          | 25  | 170   | 34,7  | 32  | DN.. 1506...                |
| PDJNL/R 3232 P15                   | 32          | 32  | 170   | 34,7  | 40  | DN.. 1506...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PD.. L/R.. 11                     | UP 2011                                       | HP 2011                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 2011   |
| PD.. L/R.. 15                     | UP 2421                                       | HP 2421                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 2421   |

**PDNN L/R**

Approach angle **63°** / Angolo di attacco 63° / Angle d'attaque 63°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| PDNNL/R 2525 M11                   | 25          | 25  | 150   | 30,0  | 12,5 | DN.. 1104...                |
| PDNNL/R 2525 M15                   | 25          | 25  | 150   | 36,5  | 12,5 | DN.. 1506...                |
| PDNNL/R 4025 P15                   | 40          | 25  | 170   | 36,5  | 12,5 | DN.. 1506...                |

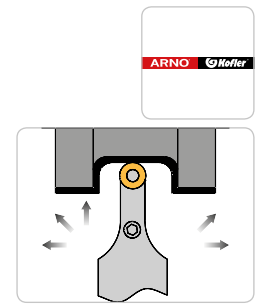
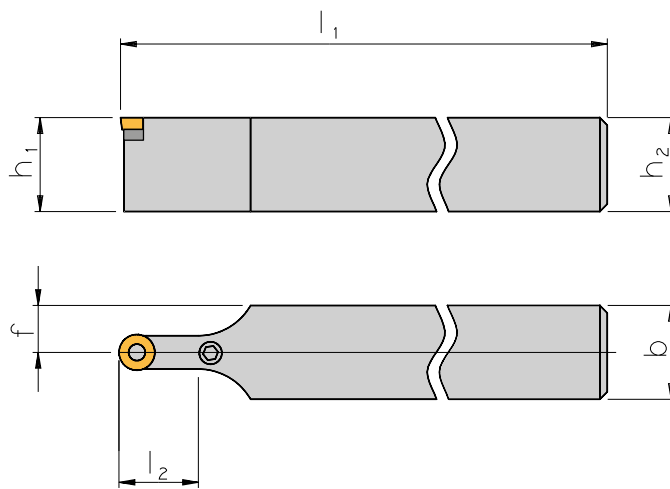
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PD.. L/R.. 11                     | UP 2011                                       | HP 2011                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 2011   |
| PD.. L/R.. 15                     | UP 2421                                       | HP 2421                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 2421   |

**PRDC N**

With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Holders / Utensili / Porte-outils

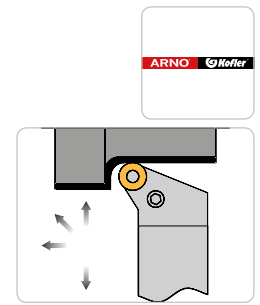
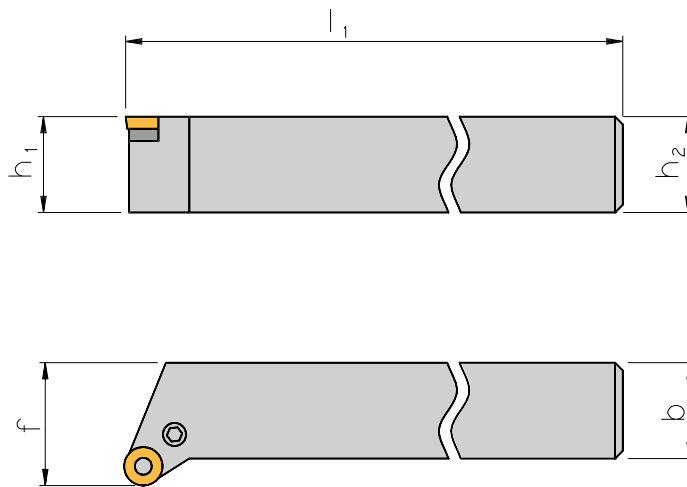
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| PRDCN 2525 M12                     | 25          | 25  | 150   | 24    | 12,5 | RC.. 1204...                |
| PRDCN 3225 P12                     | 32          | 25  | 170   | 24    | 12,5 | RC.. 1204...                |
| PRDCN 3225 P16                     | 32          | 25  | 170   | 28    | 12,5 | RC.. 1606...                |
| PRDCN 3232 P20                     | 32          | 32  | 170   | 32    | 16,0 | RC.. 2006...                |
| PRDCN 4040 S25                     | 40          | 40  | 250   | 42    | 20,0 | RC.. 2507...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PR.. N.. 12                       | UP 3111                                       | HP 3111                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 3111   |
| PR.. N.. 16                       | UP 3221                                       | HP 3221                       | SP 3221  | RP 3221  | MP 1111   | KP 1111              | P 3221   |
| PR.. N.. 20                       | UP 3421                                       | HP 3421                       | SP 3421  | RP 1221  | MP 1221   | KP 3421              | P 3421   |
| PR.. N.. 25                       | UP 3531                                       | HP 3531                       | SP 3531  | RP 1321  | MP 1321   | KP 1321              | P 3531   |

**PRGC L/R**

With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|----|-----------------------------|
| PRGCL/R 2525 M12                   | 25          | 25 | 150   | 32 | RC.. 1204...                |
| PRGCL/R 3225 P12                   | 32          | 25 | 170   | 32 | RC.. 1204...                |
| PRGCL/R 3225 P16                   | 32          | 25 | 170   | 32 | RC.. 1606...                |
| PRGCL/R 3232 P16                   | 32          | 32 | 170   | 40 | RC.. 1606...                |
| PRGCL/R 3232 P20                   | 32          | 32 | 170   | 40 | RC.. 2006...                |
| PRGCL/R 4040 S25                   | 40          | 40 | 250   | 50 | RC.. 2507...                |

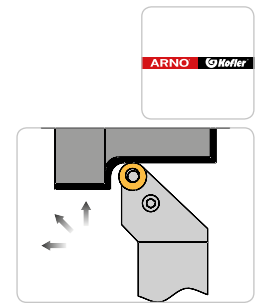
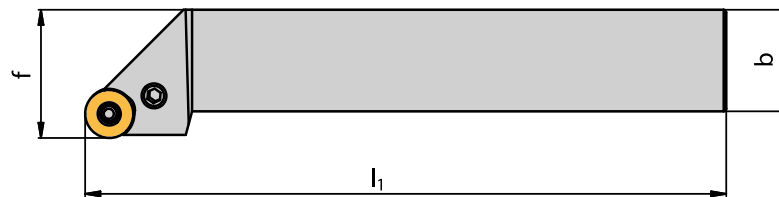
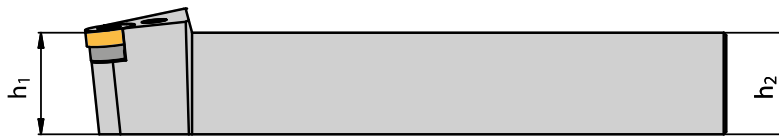
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PRGC.. 12                         | UP 3111                                       | HP 3111                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 3111   |
| PRGC.. 16                         | UP 3221                                       | HP 3221                       | SP 3221  | RP 3221  | MP 1111   | KP 1111              | P 3221   |
| PRGC.. 20                         | UP 3421                                       | HP 3421                       | SP 3421  | RP 1221  | MP 1221   | KP 3421              | P 3421   |
| PRGC.. 25                         | UP 3531                                       | HP 3531                       | SP 3531  | RP 1321  | MP 1321   | KP 1321              | P 3531   |



**PRGN L/R**

With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

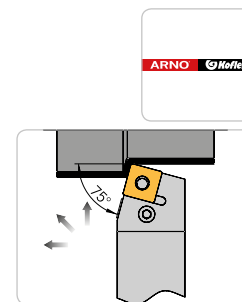
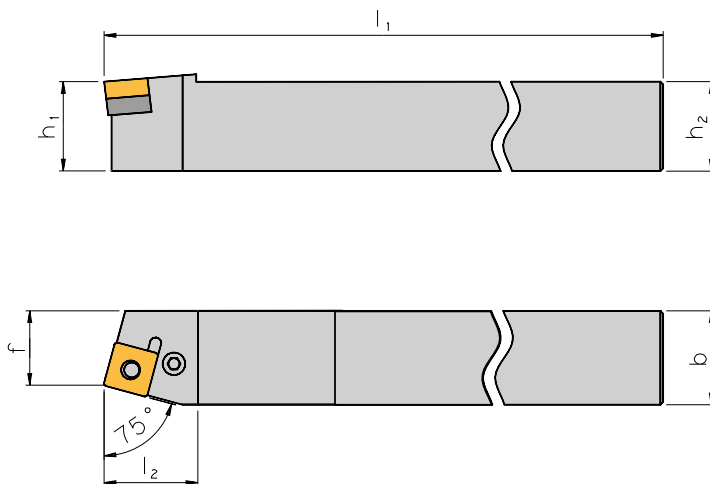
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-----|-----------------------------|
| PRGNL/R 2020 K09                   | 20          | 20  | 125   | 25  | RN.. 0903...                |
| PRGNR 2525 M12                     | 25          | 25  | 150   | 32  | RN.. 1204...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PR.. L/R.. 09                     | UP 4751                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 4751   |
| PR.. R.. 12                       | UP 4111                                       | HP 4111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 4111   |

**PSBN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

Holder / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| PSBNL/R 2020 K12                   | 20          | 20 | 125   | 27,5  | 17 | SN.. 1204...                |
| PSBNL/R 2525 M12                   | 25          | 25 | 150   | 27,5  | 22 | SN.. 1204...                |
| PSBNL/R 2525 M15                   | 25          | 25 | 150   | 27,5  | 22 | SN.. 1506...                |
| PSBNL/R 3225 P12                   | 32          | 25 | 170   | 32,0  | 22 | SN.. 1204...                |
| PSBNL/R 3232 P15                   | 32          | 32 | 170   | 32,0  | 27 | SN.. 1506...                |
| PSBNL/R 3232 P19                   | 32          | 32 | 170   | 39,2  | 27 | SN.. 1906...                |
| PSBNL/R 4040 S25                   | 40          | 40 | 250   | 47,5  | 35 | SN.. 2507...                |
| PSBNR 4040 S19                     | 40          | 40 | 250   | 38,5  | 35 | SN.. 1906...                |

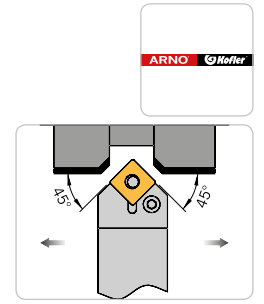
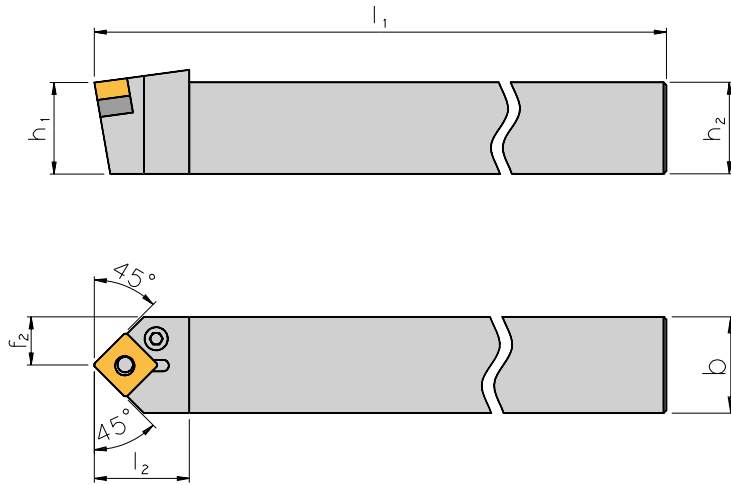
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PS.. L/R.. 12                     | UP 5112                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 5112   |
| PS.. L/R.. 15                     | UP 5421                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 5421   |
| PS.. L/R.. 19                     | UP 5321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 5321   |
| PS.. L/R.. 25                     | UP 5531                                       | HP 5531                       | SP 3641  | RP 3641  | MP 3641   | KP 3421              | -  |

**PSDN N**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



**Holders / Utensili / Porte-outils**

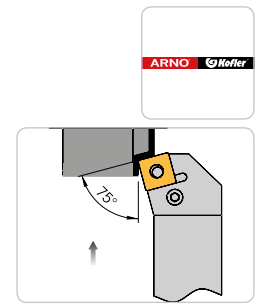
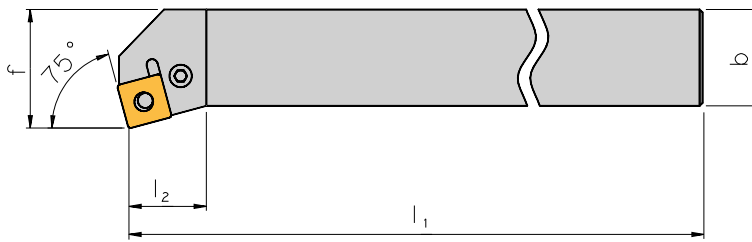
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-----------------------------|
| PSDNN 1616 H09                     | 16          | 16  | 100   | 21,0  | 8,3   | SN.. 0903...                |
| PSDNN 2020 K12                     | 20          | 20  | 125   | 27,6  | 10,3  | SN.. 1204...                |
| PSDNN 2525 M12                     | 25          | 25  | 150   | 27,6  | 12,8  | SN.. 1204...                |
| PSDNN 3225 P15                     | 32          | 25  | 170   | 32,0  | 13,0  | SN.. 1506...                |
| PSDNN 4040 S25                     | 40          | 40  | 250   | 48,8  | 21,0  | SN.. 2507...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PS.. N.. 09                       | UP 5751                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 5751   |
| PS.. N.. 12                       | UP 5112                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 5112   |
| PS.. N.. 15                       | UP 5421                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 5421   |
| PS.. N.. 25                       | UP 5531                                       | HP 5531                       | SP 3641  | RP 3641  | MP 3641   | KP 3421              | -  |

**PSKN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PSKNR 1616 H09                     | 16          | 16  | 100   | 18,7  | 20  | SN.. 0903...                |
| PSKNL/R 2020 K12                   | 20          | 20  | 125   | 22,7  | 25  | SN.. 1204...                |
| PSKNL/R 2525 M12                   | 25          | 25  | 150   | 22,7  | 32  | SN.. 1204...                |
| PSKNL/R 2525 M15                   | 25          | 25  | 150   | 22,7  | 32  | SN.. 1506...                |
| PSKNL/R 3225 P12                   | 32          | 25  | 170   | 32,0  | 32  | SN.. 1204...                |
| PSKNL 3232 P15                     | 32          | 32  | 170   | 32,0  | 40  | SN.. 1506...                |
| PSKNL/R 3232 P19                   | 32          | 32  | 170   | 33,7  | 40  | SN.. 1906...                |
| PSKNL/R 4040 S19                   | 40          | 40  | 250   | 37,6  | 50  | SN.. 1906...                |

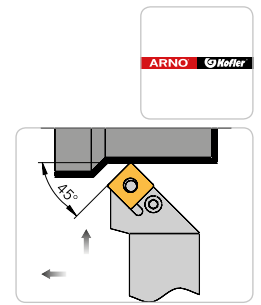
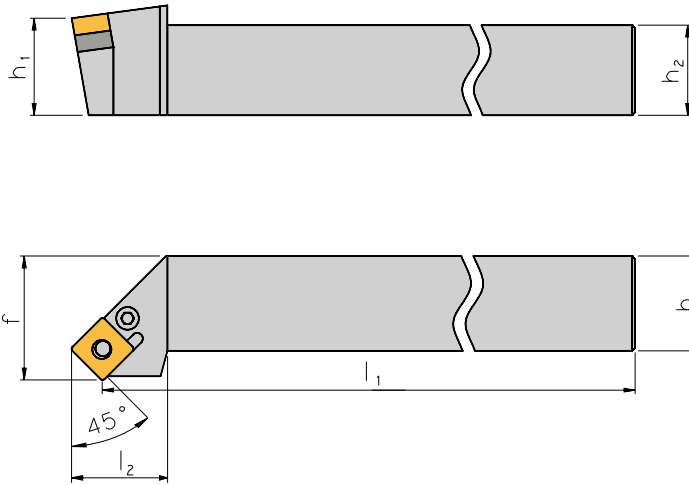
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PS.. L/R.. 12                     | UP 5112                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 5112   |
| PS.. L/R.. 15                     | UP 5421                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 5421   |
| PS.. L/R.. 19                     | UP 5321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 5321   |
| PS.. R.. 09                       | UP 5751                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 5751   |

**PSSN L/R**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PSSNR 1616 H09                     | 16          | 16  | 100   | 21,2  | 20  | SN.. 0903...                |
| PSSNL/R 2020 K12                   | 20          | 20  | 125   | 29,3  | 25  | SN.. 1204...                |
| PSSNL/R 2525 M12                   | 25          | 25  | 150   | 29,3  | 32  | SN.. 1204...                |
| PSSNL/R 2525 M15                   | 25          | 25  | 150   | 29,3  | 32  | SN.. 1506...                |
| PSSNL/R 3225 P12                   | 32          | 25  | 170   | 32,0  | 32  | SN.. 1204...                |
| PSSNL/R 3232 P15                   | 32          | 32  | 170   | 32,0  | 40  | SN.. 1506...                |
| PSSNL/R 3232 P19                   | 32          | 32  | 170   | 40,2  | 40  | SN.. 1906...                |
| PSSNL 4040 S19                     | 40          | 40  | 250   | 39,5  | 50  | SN.. 1906...                |
| PSSNR 4040 S25                     | 40          | 40  | 250   | 53,0  | 50  | SN.. 2507...                |

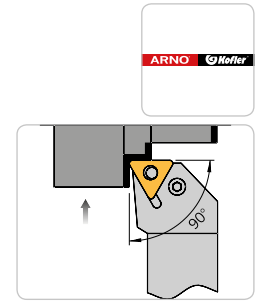
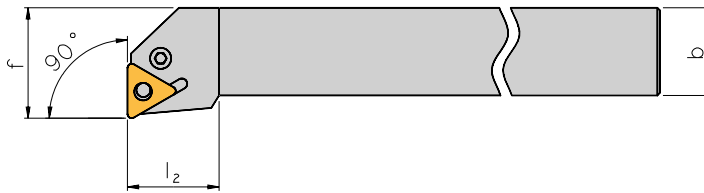
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PS.. R.. 09                       | UP 5751                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 5751   |
| PS.. L/R.. 12                     | UP 5112                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 5112   |
| PS.. L/R.. 15                     | UP 5421                                       | HP 1221                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | P 5421   |
| PS.. L/R.. 19                     | UP 5321                                       | HP 1321                       | SP 1321  | RP 1321  | MP 1321   | KP 1321              | P 5321   |
| PS.. R.. 25                       | UP 5531                                       | HP 5531                       | SP 3641  | RP 3641  | MP 3641   | KP 3421              | -  |

**PTFN L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°

With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserito<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|------------------------------|
| PTFNR 1616 H16                     | 16          | 16  | 100   | 19,7  | 20  | TN.. 1604...                 |
| PTFNL/R 2020 K16                   | 20          | 20  | 125   | 20,2  | 25  | TN.. 1604...                 |
| PTFNL/R 2525 M16                   | 25          | 25  | 150   | 20,2  | 32  | TN.. 1604...                 |
| PTFNL/R 2525 M22                   | 25          | 25  | 150   | 25,2  | 32  | TN.. 2204...                 |

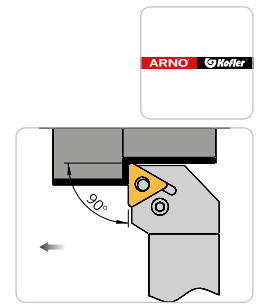
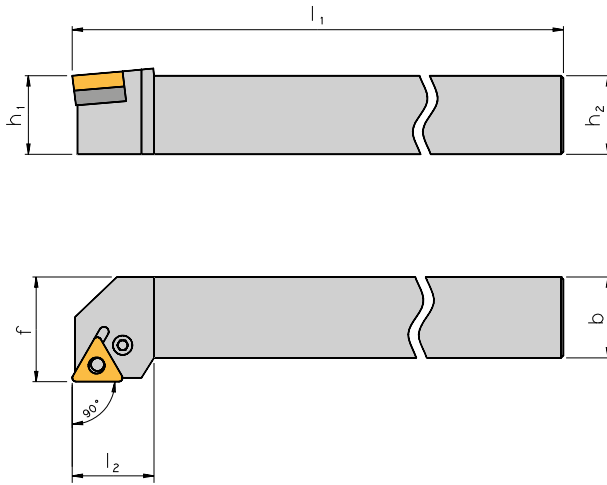
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PT.. L/R.. 16                     | UP 6211                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 6211   |
| PT.. L/R.. 22                     | UP 6811                                       | HP 1111                       | SP 1111  | -  | MP 1111   | KP 1111              | P 6811   |

**PTGN L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PTGNL/R 1616 H16                   | 16          | 16  | 100   | 20,0  | 20  | TN.. 1604...                |
| PTGNL/R 2020 K16                   | 20          | 20  | 125   | 20,0  | 25  | TN.. 1604...                |
| PTGNL/R 2525 M16                   | 25          | 25  | 150   | 22,2  | 32  | TN.. 1604...                |
| PTGNL/R 2525 M22                   | 25          | 25  | 150   | 28,7  | 32  | TN.. 2204...                |
| PTGNR 3225 P16                     | 32          | 25  | 170   | 22,2  | 32  | TN.. 1604...                |
| PTGNL/R 3232 P22                   | 32          | 32  | 170   | 28,7  | 40  | TN.. 2204...                |
| PTGNL/R 4040 S27                   | 40          | 40  | 250   | 34,0  | 50  | TN.. 2706...                |

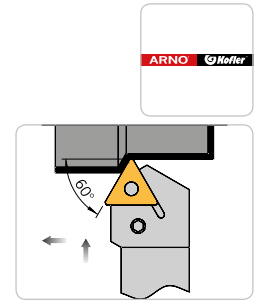
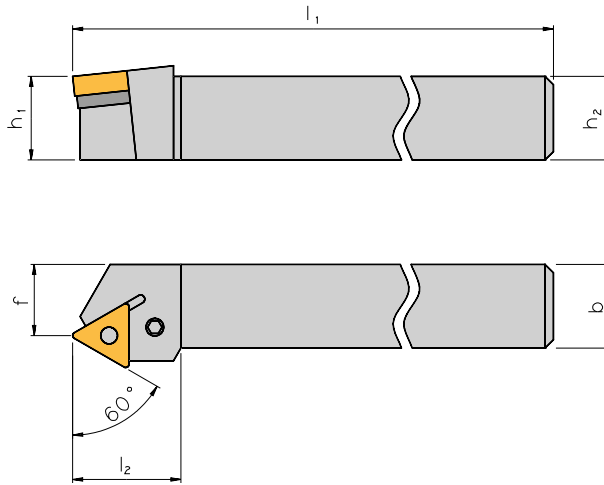
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PT.. L/R.. 16                     | UP 6211                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 6211   |
| PT.. L/R.. 22                     | UP 6811                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 6811   |
| PT.. L/R.. 27                     | UP 6921                                       | HP 6921                       | SP 1221  | RP 1221  | MP 1221   | KP 1111              | -  |



**PTTN L/R**

Approach angle 60° / Angolo di attacco 60° / Angle d'attaque 60°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| PTTNL/R 2020 K16                   | 20          | 20  | 125   | 25,9  | 17  | TN.. 1604...                |
| PTTNL/R 2525 M22                   | 25          | 25  | 150   | 31,9  | 22  | TN.. 2204...                |

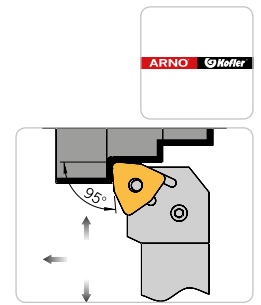
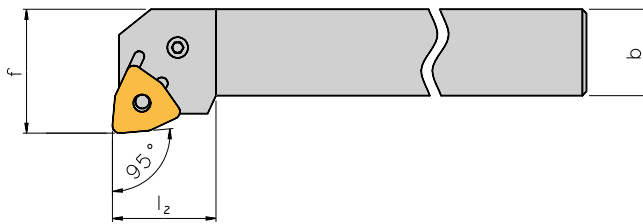
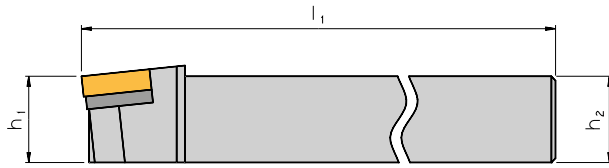
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PT.. L/R.. 16                     | UP 6211                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 6211   |
| PT.. L/R.. 22                     | UP 6811                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 6811   |

**PWLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

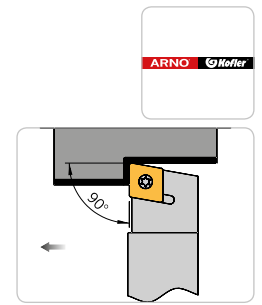
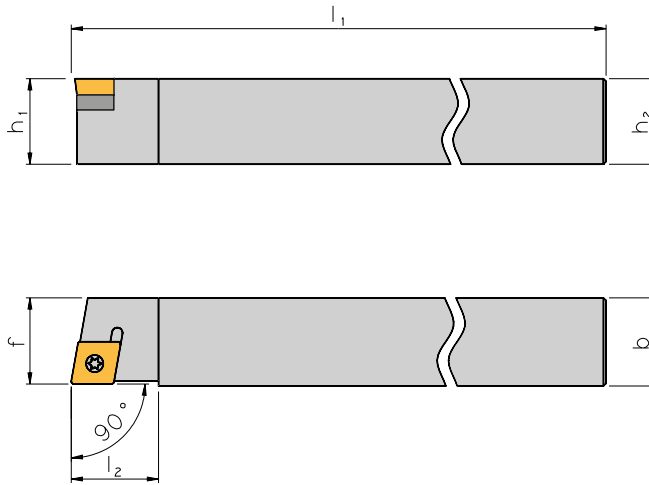
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| PWLN/L/R 1616 H06                  | 16          | 16  | 100   | 20    | 20  | WN.. 0604...               |
| PWLN/L/R 2020 K06                  | 20          | 20  | 125   | 25    | 25  | WN.. 0604...               |
| PWLN/L/R 2020 K08                  | 20          | 20  | 125   | 25    | 25  | WN.. 0804...               |
| PWLN/L/R 2525 M06                  | 25          | 25  | 150   | 25    | 32  | WN.. 0604...               |
| PWLN/L/R 2525 M08                  | 25          | 25  | 150   | 25    | 32  | WN.. 0804...               |
| PWLN/L/R 3225 P08                  | 32          | 25  | 170   | 25    | 32  | WN.. 0804...               |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| PW.. L/R.. 06                     | UP 71111                                      | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 71112  |
| PW.. L/R.. 08                     | UP 71011                                      | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 71011  |

SCAC L/R

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SCACL/R 0808 D06                   | 8           | 8   | 60    | 9     | 8   | CC.. 0602...                |
| SCACR 0808 K06                     | 8           | 8   | 125   | 9     | 8   | CC.. 0602...                |
| SCACL/R 1010 E06                   | 10          | 10  | 70    | 9     | 10  | CC.. 0602...                |
| SCACR 1010 M06                     | 10          | 10  | 150   | 9     | 10  | CC.. 0602...                |
| SCACL/R 1212 F09                   | 12          | 12  | 80    | 13    | 12  | CC.. 09T3...                |
| SCACL/R 1212 M09                   | 12          | 12  | 150   | 13    | 12  | CC.. 09T3...                |
| SCACL/R 1414 M09                   | 14          | 14  | 150   | 13    | 14  | CC.. 09T3...                |
| SCACL/R 1616 H09                   | 16          | 16  | 100   | 13    | 16  | CC.. 09T3...                |
| SCACL/R 2020 K12                   | 20          | 20  | 125   | 17    | 20  | CC.. 1204...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. L/R.. 06                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SC.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |
| SC.. L/R.. 1212.. 09              | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| SC.. L/R.. 1616.. 09              | GBS 1111                   | SS 1111              | US 1111                                 | KS 1115              | S 1116                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

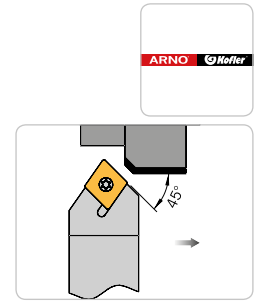
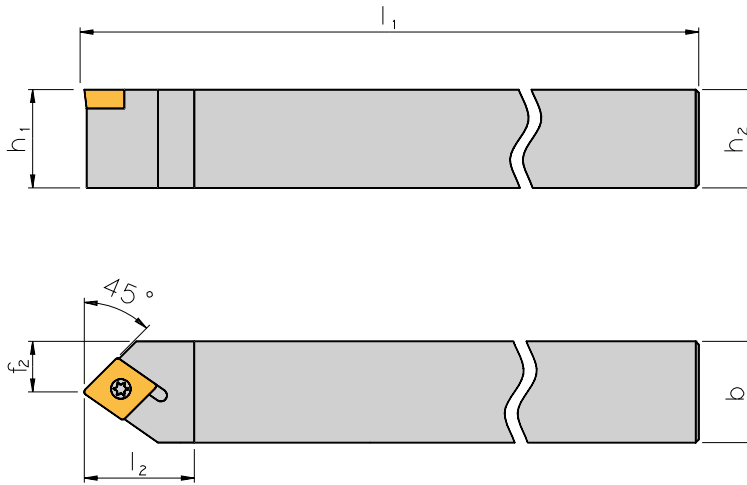
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SCDC L**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|----------------------------|
| SCDCL 0808 K06                     | 8           | 8   | 125   | 13    | 4     | CC.. 0602...               |
| SCDCL 1010 M06                     | 10          | 10  | 150   | 13    | 5     | CC.. 0602...               |
| SCDCL 1212 M09                     | 12          | 12  | 150   | 18    | 6     | CC.. 09T3...               |
| SCDCL 1414 M09                     | 14          | 14  | 150   | 18    | 7     | CC.. 09T3...               |

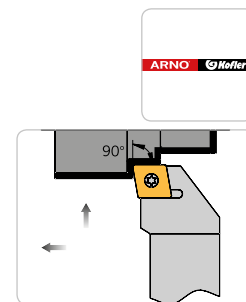
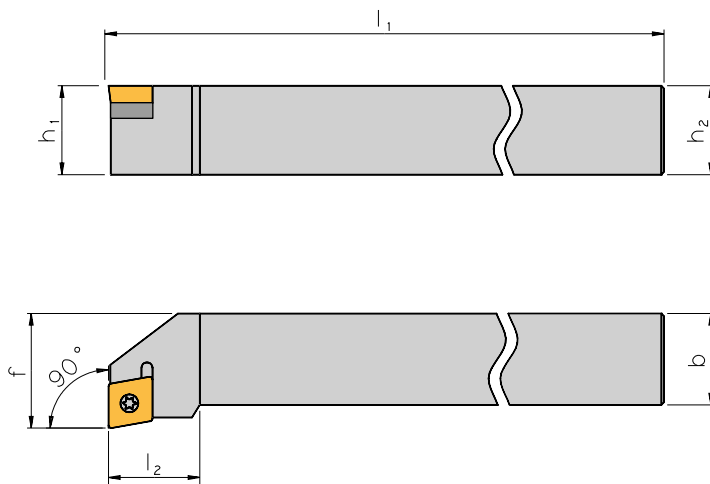
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| SC.. L.. 06                       | SS 1751              | KS 1751              | S 1751                                 |
| SC.. L.. 09                       | SS 1111              | KS 1111              | S 1111                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver  
Set ricambi include: 3 Viti Torx, 1 Chiave Torx  
L'assortiment comprend : 3 vis, 1 clé

**SCFC L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SCFCL/R 0808 D06                   | 8           | 8   | 60    | 10    | 10  | CC.. 0602...                |
| SCFCL/R 1010 E06                   | 10          | 10  | 70    | 10    | 12  | CC.. 0602...                |
| SCFCL/R 1212 F09                   | 12          | 12  | 80    | 13    | 16  | CC.. 09T3...                |
| SCFCL/R 1616 H09                   | 16          | 16  | 100   | 13    | 20  | CC.. 09T3...                |
| SCFCL/R 2020 K12                   | 20          | 20  | 125   | 17    | 25  | CC.. 1204...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. L/R.. 06                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SC.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |
| SC.. L/R.. 1212.. 09              | -                          | SS 1111              | -                                       | KS 1751              | S 1111                                 |
| SC.. L/R.. 1616.. 09              | GBS 1221                   | SS 1111              | US 1111                                 | KS 1115              | S 1116                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

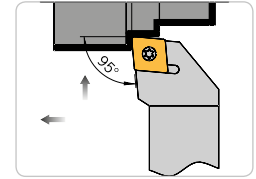
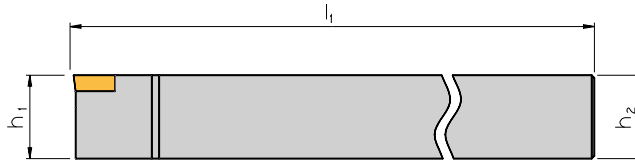
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SCLC L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SCLCL/R 0808 D06                   | 8           | 8   | 60    | 9     | 10  | CC.. 0602...                |
| SCLCL/R 1010 E06                   | 10          | 10  | 70    | 9     | 12  | CC.. 0602...                |
| SCLCL/R 1212 F09                   | 12          | 12  | 80    | 15    | 16  | CC.. 09T3...                |
| SCLCL/R 1616 H09                   | 16          | 16  | 100   | 17    | 20  | CC.. 09T3...                |
| SCLCL/R 1616 H12                   | 16          | 16  | 100   | 20    | 20  | CC.. 1204...                |
| SCLCL/R 2020 K09                   | 20          | 20  | 125   | 17    | 25  | CC.. 09T3...                |
| SCLCL/R 2020 K12                   | 20          | 20  | 125   | 20    | 25  | CC.. 1204...                |
| SCLCL/R 2525 M12                   | 25          | 25  | 150   | 20    | 32  | CC.. 1204...                |
| SCLCL/R 3225 P12                   | 32          | 25  | 170   | 20    | 32  | CC.. 1204...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. L/R.. 06                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SC.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |
| SC.. L/R.. 1212.. 09              | -                          | SS 1111              | -                                       | KS 1751              | S 1111                                 |
| SC.. L/R.. 1616.. 09              | GBS 1221                   | SS 1111              | US 1111                                 | KS 1115              | S 1116                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

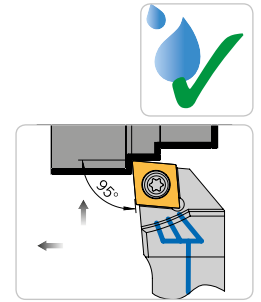
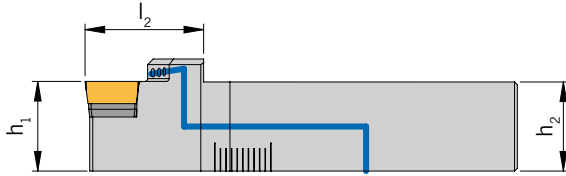
**SCLCR**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°

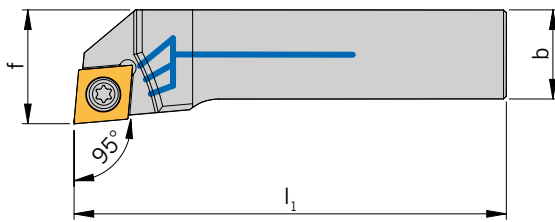
Tool holders with IK-UN - special for INDEX / TRAUB TNL18 / TNL20 / TNL 32 /

Utensile con IK-UN - specifico per INDEX / TRAUB TNL18 / TNL20 / TNL 32 /

Porte-outils avec IK-UN - spécifiques à INDEX/TRAUB TNL18/TNL20/TNL 32



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| SCLCR 1616X09- <b>IK-UN-TR</b>     | 16          | 16  | 77,2  | 21,2  | 20,3 | CC..09T3..                  |

**Spare Parts / Ricambi / Pièces de rechange**

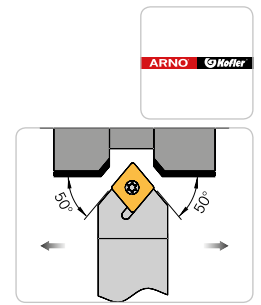
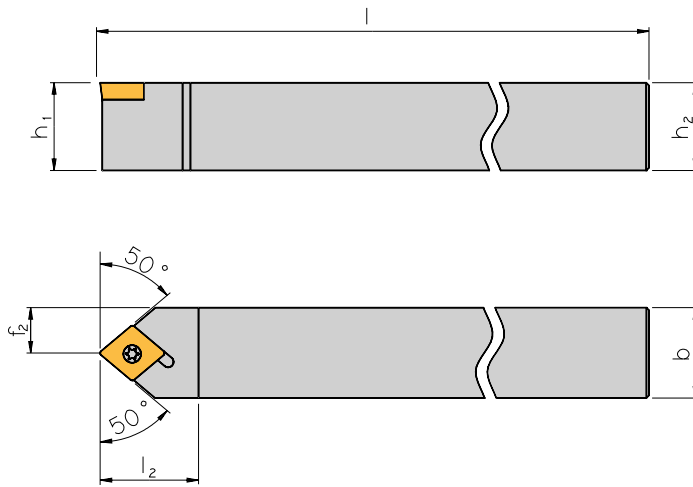
| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SCLCR...X09...                    | SS 1111              | KS 1111              |



SCMC N

Approach angle 50° / Angolo di attacco 50° / Angle d'attaque 50°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-----------------------------|
| SCMCN 1616 H12                     | 16          | 16  | 100   | 25    | 8,0   | CC.. 1204...                |
| SCMCN 2020 K12                     | 20          | 20  | 125   | 25    | 10,0  | CC.. 1204...                |
| SCMCN 2525 M12                     | 25          | 25  | 150   | 25    | 12,5  | CC.. 1204...                |
| SCMCN 3225 P12                     | 32          | 25  | 170   | 25    | 12,5  | CC.. 1204...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. N.. 12                       | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |

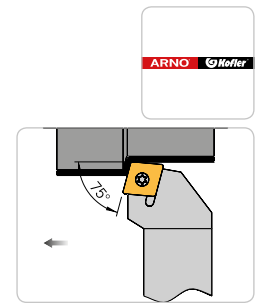
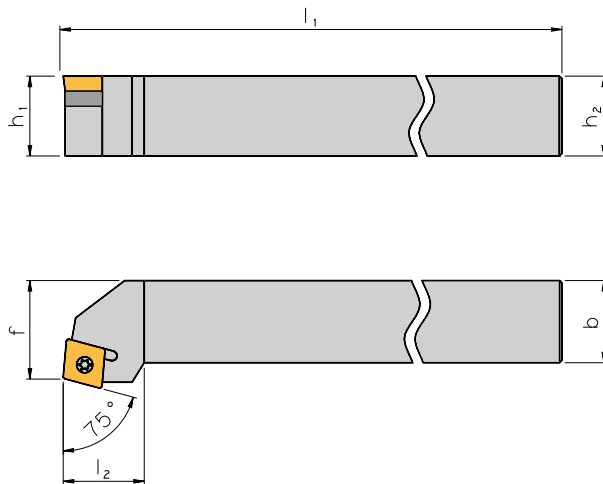
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove prevista, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

### SCRC L/R

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SCRC L 0808 D06                    | 8           | 8   | 60    | 10    | 9   | CC.. 0602...                |
| SCRC L/R 1010 E06                  | 10          | 10  | 70    | 10    | 11  | CC.. 0602...                |
| SCRC L/R 1212 F09                  | 12          | 12  | 80    | 16    | 13  | CC.. 09T3...                |
| SCRC L/R 1616 H09                  | 16          | 16  | 100   | 17    | 17  | CC.. 09T3...                |
| SCRC L/R 1616 H12                  | 16          | 16  | 100   | 20    | 17  | CC.. 1204...                |
| SCRC L/R 2020 K09                  | 20          | 20  | 125   | 17    | 22  | CC.. 09T3...                |
| SCRC L/R 2020 K12                  | 20          | 20  | 125   | 20    | 22  | CC.. 1204...                |
| SCRC R 2525 M12                    | 25          | 25  | 150   | 20    | 27  | CC.. 1204...                |
| SCRC L/R 3225 P12                  | 32          | 25  | 170   | 20    | 27  | CC.. 1204...                |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. L/R.. 06                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SC.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |
| SC.. L/R.. 1212.. 09              | -                          | SS 1111              | -                                       | KS 1751              | S 1111                                 |
| SC.. L/R.. 1616.. 09              | GBS 1221                   | SS 1111              | US 1111                                 | KS 1115              | S 1116                                 |

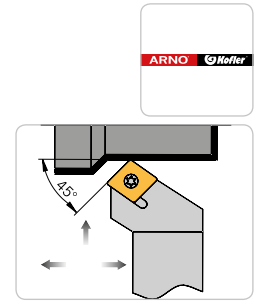
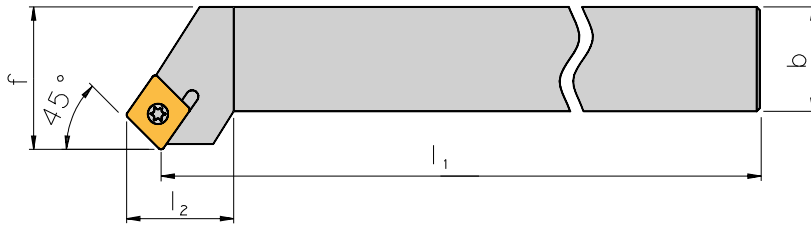
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SCSC L/R**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SCSCL/R 1616 H12                   | 16          | 16  | 100   | 20    | 20  | CC.. 1204...                |
| SCSCL/R 2020 K12                   | 20          | 20  | 125   | 20    | 25  | CC.. 1204...                |
| SCSCL/R 2525 M12                   | 25          | 25  | 150   | 20    | 32  | CC.. 1204...                |
| SCSCL/R 3225 P12                   | 32          | 25  | 170   | 20    | 32  | CC.. 1204...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SC.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |

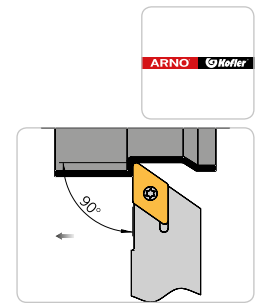
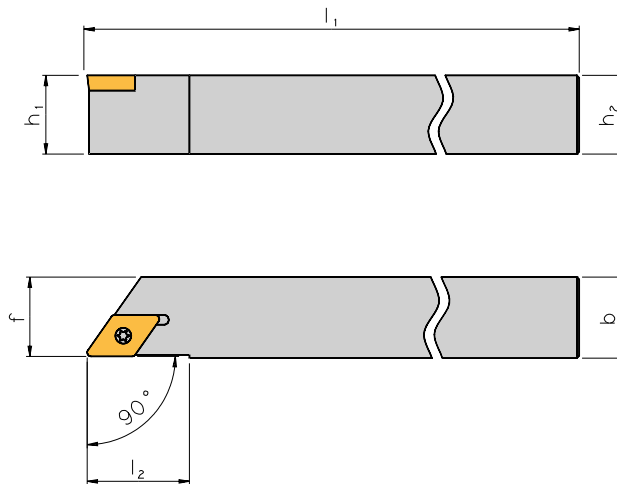
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

## SDAC L/R

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SDACL/R 0808 K07                   | 8           | 8   | 125   | 14    | 8   | DC.. 0702...                |
| SDACL/R 1010 M07                   | 10          | 10  | 150   | 14    | 10  | DC.. 0702...                |
| SDACL/R 1212 M07                   | 12          | 12  | 150   | 14    | 12  | DC.. 0702...                |
| SDACL/R 1212 M11                   | 12          | 12  | 150   | 14    | 12  | DC.. 11T3...                |
| SDACL/R 1414 M11                   | 14          | 14  | 150   | 21    | 14  | DC.. 11T3...                |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| SD.. L/R.. 07                     | SS 1751              | KS 1751              | S 1751                                 |
| SD.. L/R.. 11                     | S 1111               | KS 1111              | S 1111                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver

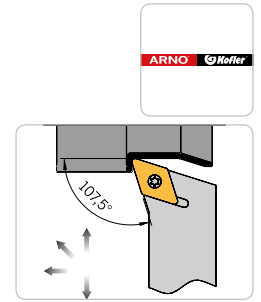
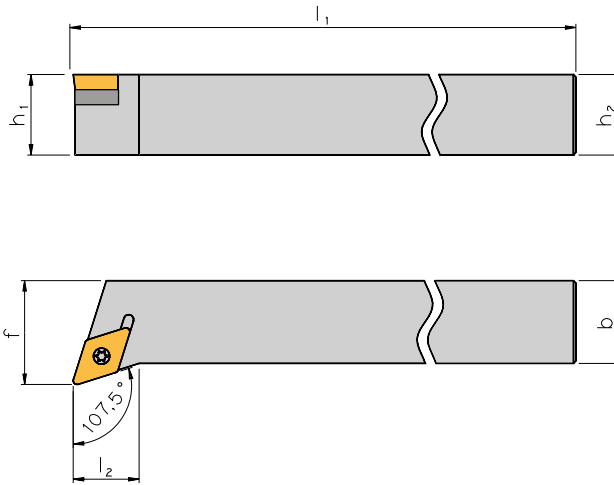
Set ricambi include: 3 Viti Torx, 1 Chiave Torx

L'assortiment comprend : 3 vis, 1 clé

**SDHC L/R**

Approach angle 107,5° / Angolo di attacco 107,5° / Angle d'attaque 107,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SDHCL/R 1010 E07                   | 10          | 10  | 70    | 5,5   | 12  | DC.. 0702...                |
| SDHCL/R 1212 F07                   | 12          | 12  | 80    | 12,0  | 16  | DC.. 0702...                |
| SDHCL/R 1616 H11                   | 16          | 16  | 100   | 10,4  | 20  | DC.. 11T3...                |
| SDHCL/R 2020 K11                   | 20          | 20  | 125   | 14,0  | 25  | DC.. 11T3...                |
| SDHCL/R 2525 M11                   | 25          | 25  | 150   | 20,0  | 32  | DC.. 11T3...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SD.. L/R.. 07                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SD.. L/R.. 11                     | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |

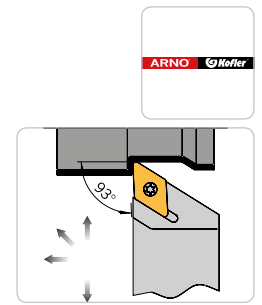
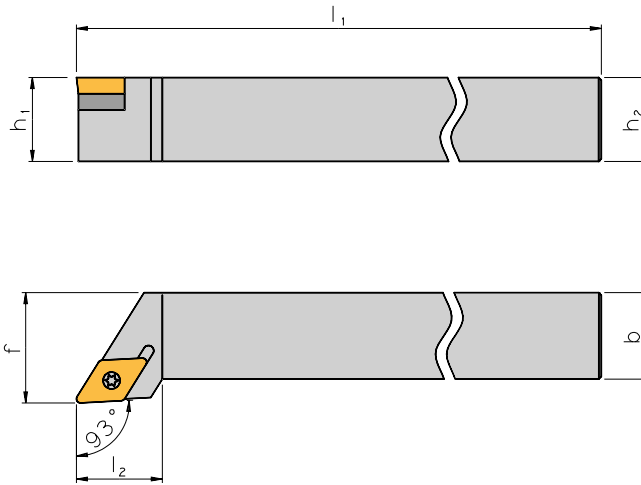
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SDJC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SDJCL/R 0808 D07                   | 8           | 8   | 60    | 13,0  | 10  | DC.. 0702...                |
| SDJCL/R 1010 E07                   | 10          | 10  | 70    | 13,0  | 12  | DC.. 0702...                |
| SDJCL/R 1212 F07                   | 12          | 12  | 80    | 14,5  | 16  | DC.. 0702...                |
| SDJCL/R 1616 H11                   | 16          | 16  | 100   | 20,0  | 20  | DC.. 11T3...                |
| SDJCL/R 2020 K11                   | 20          | 20  | 125   | 20,5  | 25  | DC.. 11T3...                |
| SDJCL/R 2525 M11                   | 25          | 25  | 150   | 21,5  | 32  | DC.. 11T3...                |
| SDJCL/R 3225 P11                   | 32          | 25  | 170   | 21,5  | 32  | DC.. 11T3...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SD.. L/R.. 07                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SD.. L/R.. 11                     | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

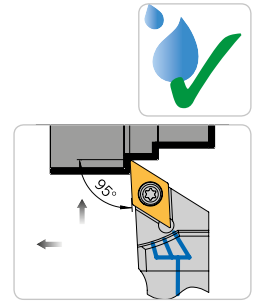
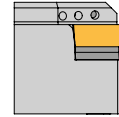
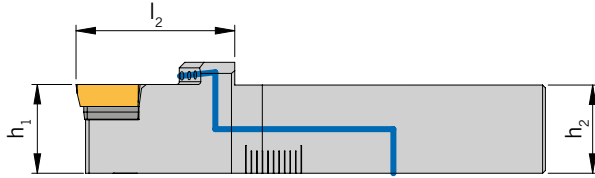
L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SDJCR**

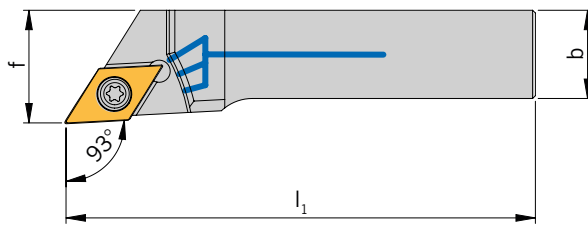
Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°

Tool holders with IK-UN - special for INDEX / TRAUB TNL18 / TNL20 / TNL 32 /  
Utensile con IK-UN - specifico per INDEX / TRAUB TNL18 / TNL20 / TNL 32 / Por-  
te-outils avec IK-UN - spécifiques à INDEX/TRAUB TNL18/TNL20/TNL 32

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

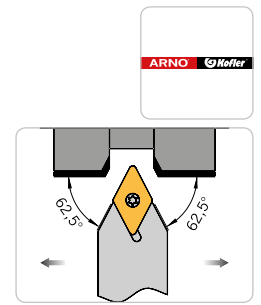
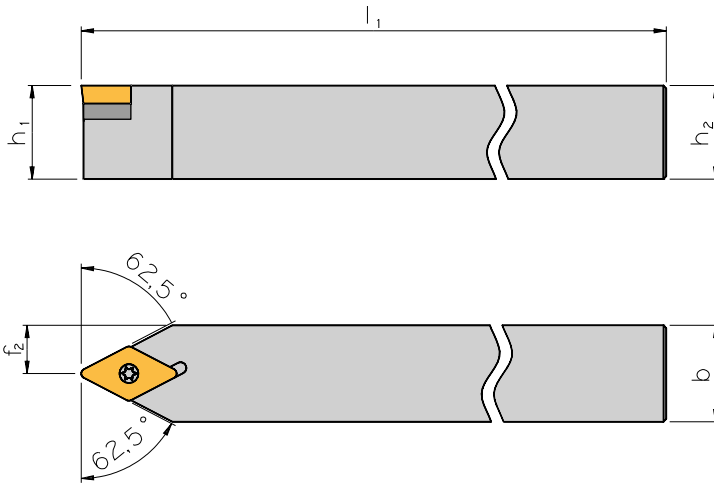
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| SDJCR 1616X11-IK-UN-TR             | 16          | 16  | 84,5  | 28,6  | 20,3 | DC..11T3..                  |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SDJCR...X11...                    | SS 1111              | KS 1111              |

**SDNC N**

Approach angle 62,5° / Angolo di attacco 62,5° / Angle d'attaque 62,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



**1**

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | h <sub>1</sub> / h <sub>2</sub> | b  | l <sub>1</sub> | f <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------------------------|----|----------------|----------------|-----------------------------|
| SDNCN 0808 D07                     | 8                               | 8  | 60             | 4,0            | DC.. 0702...                |
| SDNCN 0808 K07                     | 8                               | 8  | 125            | 4,0            | DC.. 0702...                |
| SDNCN 1010 E07                     | 10                              | 10 | 70             | 5,0            | DC.. 0702...                |
| SDNCN 1010 M07                     | 10                              | 10 | 150            | 5,0            | DC.. 0702...                |
| SDNCN 1212 F07                     | 12                              | 12 | 80             | 6,0            | DC.. 0702...                |
| SDNCN 1212 M07                     | 12                              | 12 | 150            | 6,0            | DC.. 0702...                |
| SDNCN 1212 M11                     | 12                              | 12 | 150            | 6,0            | DC.. 11T3...                |
| SDNCN 1414 M11                     | 14                              | 14 | 150            | 7,0            | DC.. 11T3...                |
| SDNCN 1616 H11                     | 16                              | 16 | 100            | 8,0            | DC.. 11T3...                |
| SDNCN 2020 K11                     | 20                              | 20 | 125            | 10,0           | DC.. 11T3...                |
| SDNCN 2525 M11                     | 25                              | 25 | 150            | 12,5           | DC.. 11T3...                |

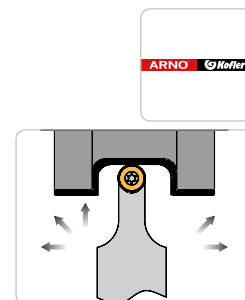
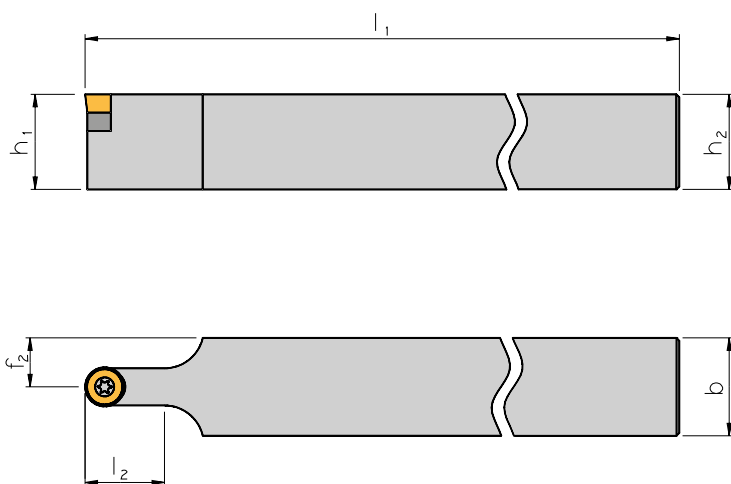
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SD.. N.. 07                       | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SD.. N.. 1212-1414.. 11           | -                          | S 1111               | -                                       | KS 1111              | S 1111                                 |
| SD.. N.. 1616-2525.. 11           | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |



## SRDC N

With screw clamping / Con bloccaggio a vite / Avec serrage par vis



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-----------------------------|
| SRDCN 1212 F06                     | 12          | 12  | 80    | 12,4  | 6,0   | RC.. 0602...                |
| SRDCN 1616 H06                     | 16          | 16  | 100   | 12,4  | 8,0   | RC.. 0602...                |
| SRDCN 1616 H08                     | 16          | 16  | 100   | 16,4  | 8,0   | RC.. 0803...                |
| SRDCN 1616 H10                     | 16          | 16  | 100   | 20,3  | 8,0   | RC.. 1003...                |
| SRDCN 2020 K06                     | 20          | 20  | 125   | 12,4  | 10,0  | RC.. 0602...                |
| SRDCN 2020 K08                     | 20          | 20  | 125   | 16,4  | 10,0  | RC.. 0803...                |
| SRDCN 2020 K10                     | 20          | 20  | 125   | 20,3  | 10,0  | RC.. 1003...                |
| SRDCN 2525 M06                     | 25          | 25  | 150   | 12,4  | 12,5  | RC.. 0602...                |
| SRDCN 2525 M08                     | 25          | 25  | 150   | 16,4  | 12,5  | RC.. 0803...                |
| SRDCN 2525 M10                     | 25          | 25  | 150   | 20,3  | 12,5  | RC.. 1003...                |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SR.. N.. 06                       | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SR.. N.. 08                       | -                          | SS 8831              | -                                       | KS 1751              | S 8831                                 |
| SR.. N.. 10                       | GBS 1111                   | SS 1111              | US 3431                                 | KS 1115              | S 3436                                 |

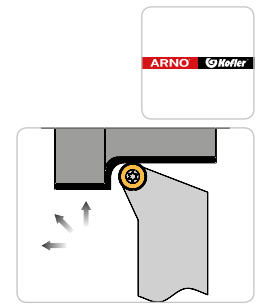
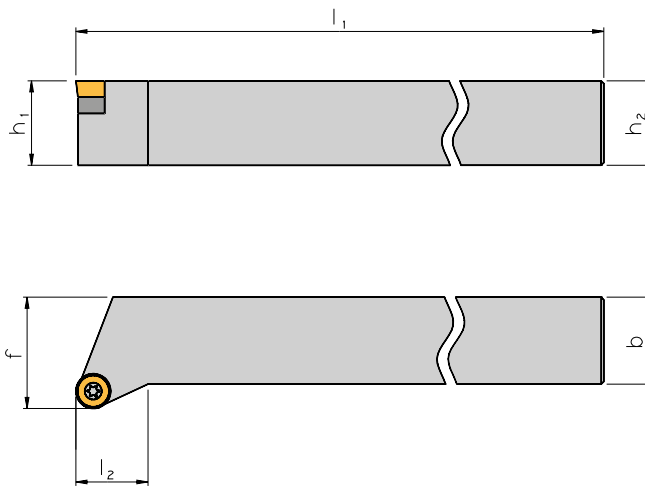
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

SRGC L/R

With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| SRGCL/R 1212 F06                   | 12          | 12 | 80    | 10,0  | 16 | RC.. 0602...                |
| SRGCL/R 1616 H06                   | 16          | 16 | 100   | 10,0  | 20 | RC.. 0602...                |
| SRGCL/R 1616 H08                   | 16          | 16 | 100   | 11,0  | 20 | RC.. 0803...                |
| SRGCL/R 1616 H10                   | 16          | 16 | 100   | 12,0  | 20 | RC.. 1003...                |
| SRGCL/R 2020 K06                   | 20          | 20 | 125   | 11,5  | 25 | RC.. 0602...                |
| SRGCL/R 2020 K08                   | 20          | 20 | 125   | 13,0  | 25 | RC.. 0803...                |
| SRGCL/R 2020 K10                   | 20          | 20 | 125   | 13,5  | 25 | RC.. 1003...                |
| SRGCL/R 2525 M06                   | 25          | 25 | 150   | 15,0  | 32 | RC.. 0602...                |
| SRGCL/R 2525 M08                   | 25          | 25 | 150   | 16,0  | 32 | RC.. 0803...                |
| SRGCL/R 2525 M10                   | 25          | 25 | 150   | 17,0  | 32 | RC.. 1003...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SR.. L/R.. 06                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SR.. L/R.. 08                     | -                          | SS 8831              | -                                       | KS 1751              | S 8831                                 |
| SR.. L/R.. 10                     | GBS 1111                   | SS 1111              | US 3431                                 | KS 1115              | S 3436                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

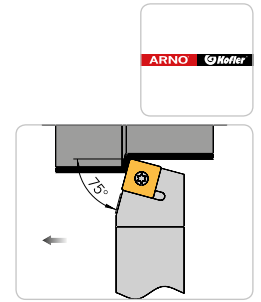
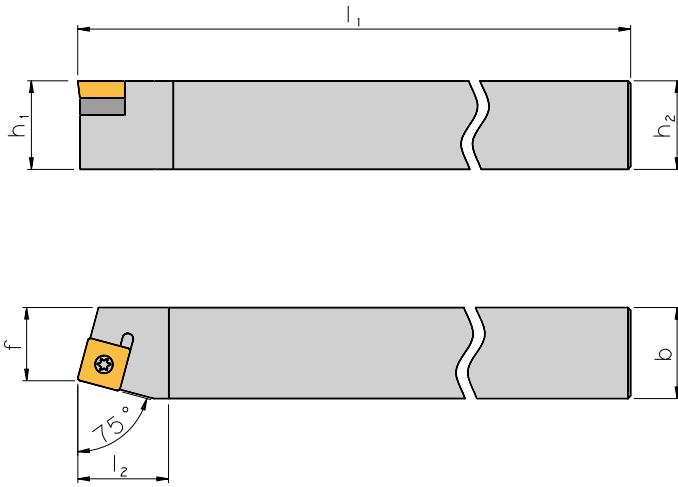
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SSBC L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SSBCL/R 1616 H09                   | 16          | 16  | 100   | 20    | 13  | SC.. 09T3...                |
| SSBCR 2020 K09                     | 20          | 20  | 125   | 20    | 17  | SC.. 09T3...                |
| SSBCL/R 2020 K12                   | 20          | 20  | 125   | 20    | 17  | SC.. 1204...                |
| SSBCL/R 2525 M12                   | 25          | 25  | 150   | 20    | 22  | SC.. 1204...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SS.. L/R.. 09                     | GBS 1111                   | SS 1111              | US 4111                                 | KS 1115              | S 4116                                 |
| SS.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |

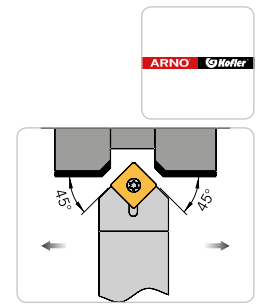
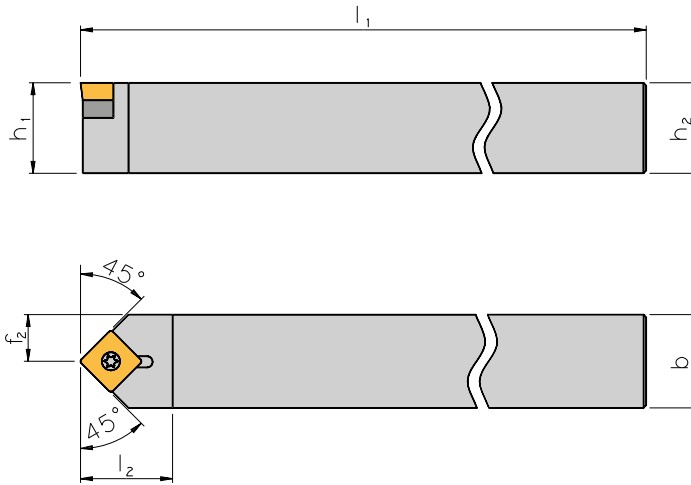
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SSDC N**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



HOLDERS / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-----------------------------|
| SSDCN 1212 F09                     | 12          | 12  | 80    | 16    | 6,0   | SC.. 09T3...                |
| SSDCN 1616 H09                     | 16          | 16  | 100   | 20    | 8,0   | SC.. 09T3...                |
| SSDCN 1616 H12                     | 16          | 16  | 100   | 25    | 8,0   | SC.. 1204...                |
| SSDCN 2020 K09                     | 20          | 20  | 125   | 20    | 10,0  | SC.. 09T3...                |
| SSDCN 2020 K12                     | 20          | 20  | 125   | 25    | 10,0  | SC.. 1204...                |
| SSDCN 2525 M12                     | 25          | 25  | 150   | 25    | 12,5  | SC.. 1204...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SS.. N.. 12                       | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |
| SS.. N.. 1212.. 09                | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| SS.. N.. 1616.. 09                | GBS 1111                   | SS 1111              | US 4111                                 | KS 1115              | S 4116                                 |

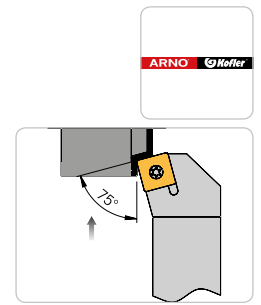
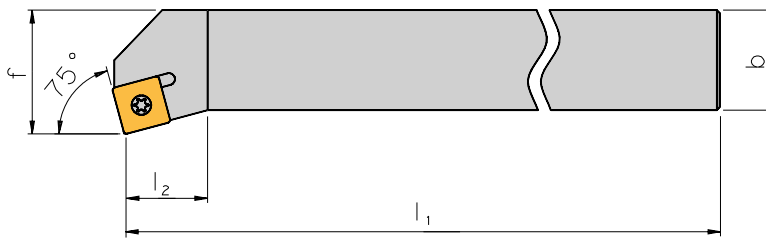
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SSKC L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| SSKCR 1616 H09                     | 16          | 16 | 100   | 22    | 20 | SC.. 09T3...                |
| SSKCL/R 1616 H12                   | 16          | 16 | 100   | 23    | 20 | SC.. 1204...                |
| SSKCL/R 2020 K09                   | 20          | 20 | 125   | 22    | 25 | SC.. 09T3...                |
| SSKCL 2020 K12                     | 20          | 20 | 125   | 23    | 25 | SC.. 1204...                |
| SSKCL/R 2525 M12                   | 25          | 25 | 150   | 23    | 32 | SC.. 1204...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SS.. L/R.. 09                     | GBS 1111                   | SS 1111              | US 4111                                 | KS 1115              | S 4116                                 |
| SS.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |

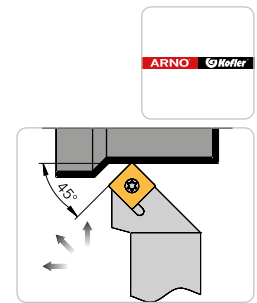
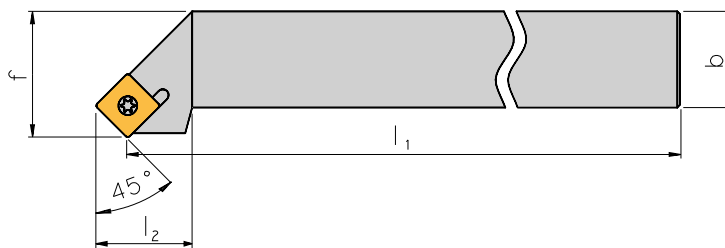
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

### SSSC L/R

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SSSCL/R 1212 F09                   | 12          | 12  | 80    | 18    | 16  | SC.. 09T3...                |
| SSSCL/R 1616 H09                   | 16          | 16  | 100   | 20    | 20  | SC.. 09T3...                |
| SSSCL/R 1616 H12                   | 16          | 16  | 100   | 25    | 20  | SC.. 1204...                |
| SSSCL/R 2020 K09                   | 20          | 20  | 125   | 20    | 25  | SC.. 09T3...                |
| SSSCL/R 2020 K12                   | 20          | 20  | 125   | 25    | 25  | SC.. 1204...                |
| SSSCL/R 2525 M12                   | 25          | 25  | 150   | 25    | 32  | SC.. 1204...                |
| SSSCL/R 3225 P12                   | 32          | 25  | 170   | 25    | 32  | SC.. 1204...                |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SS.. L/R.. 12                     | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |
| SS.. L/R.. 1212.. 09              | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| SS.. L/R.. 1616-2020.. 09         | GBS 1111                   | SS 1111              | US 4111                                 | KS 1115              | S 4116                                 |

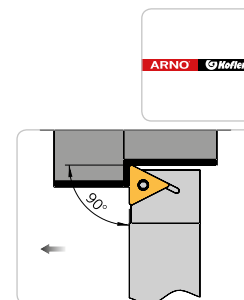
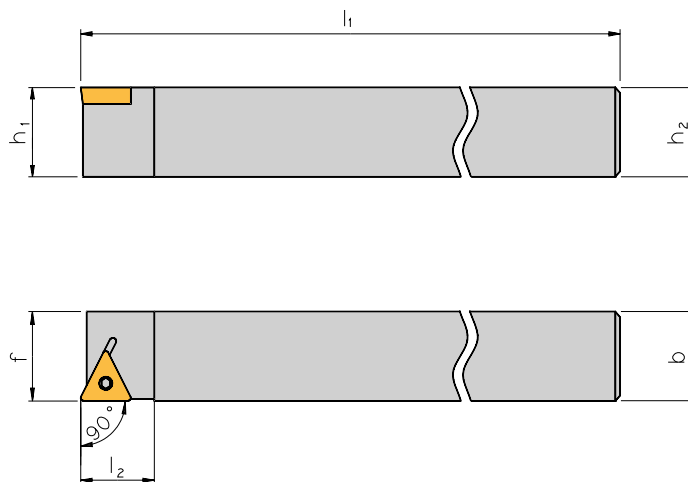
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

## STAC L/R

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Insero<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|----------------------------|
| STACR 1010 K09                     | 10          | 10  | 125   | 12    | 10  | TC.. 0902...               |
| STACL/R 1212 K11                   | 12          | 12  | 125   | 15    | 12  | TC.. 1102...               |
| STACR 1414 K11                     | 14          | 14  | 125   | 15    | 14  | TC.. 1102...               |
| STACR 1616 K11                     | 16          | 16  | 125   | 15    | 16  | TC.. 1102...               |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| ST.. L/R.. 11                     | SS 1751              | KS 1751              | S 1751                                 |
| ST.. R.. 09                       | SS 5151              | KS 5151              | S 5151                                 |

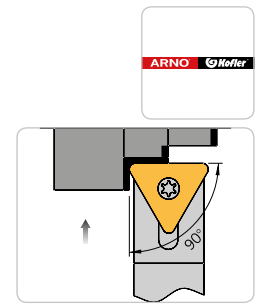
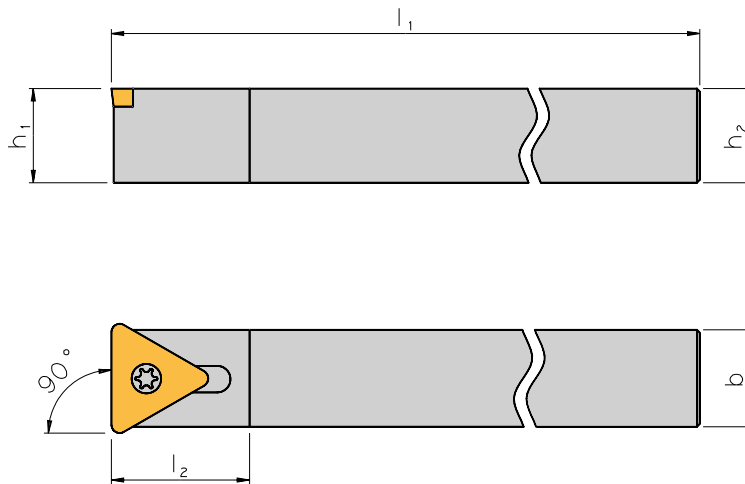
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver

Set ricambi include: 3 Viti Torx, 1 Chiave Torx

L'assortiment comprend : 3 vis, 1 clé

**STCC N**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | h <sub>1</sub> / h <sub>2</sub> | b  | l <sub>1</sub> | l <sub>2</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------------------------|----|----------------|----------------|-----------------------------|
| STCCN 0808 K09                     | 8                               | 8  | 125            | 11             | TC.. 0902...                |
| STCCN 1010 K11                     | 10                              | 10 | 125            | 15             | TC.. 1102...                |
| STCCN 1212 K11                     | 12                              | 12 | 125            | 15             | TC.. 1102...                |
| STCCN 1414 K11                     | 14                              | 14 | 125            | 21             | TC.. 1102...                |
| STCCN 1616 K11                     | 16                              | 16 | 125            | 24             | TC.. 1102...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| ST.. N.. 09                       | SS 5151              | KS 5151              | S 5151                                 |
| ST.. N.. 11                       | SS 1751              | KS 1751              | S 1751                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver

Set ricambi include: 3 Viti Torx, 1 Chiave Torx

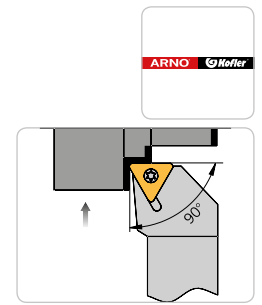
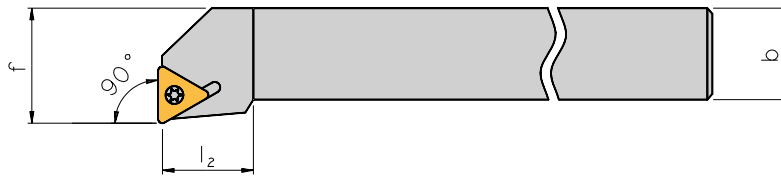
L'assortiment comprend : 3 vis, 1 clé



**STFC L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| STFCL 0808 D09                     | 8           | 8   | 60    | 11    | 10  | TC.. 0902...                |
| STFCL/R 1010 E09                   | 10          | 10  | 70    | 11    | 12  | TC.. 0902...                |
| STFCL/R 1212 F11                   | 12          | 12  | 80    | 15    | 16  | TC.. 1102...                |
| STFCL/R 1616 H16                   | 16          | 16  | 100   | 20    | 20  | TC.. 16T3...                |
| STFCL/R 2020 K16                   | 20          | 20  | 125   | 20    | 25  | TC.. 16T3...                |
| STFCL/R 2525 M16                   | 25          | 25  | 150   | 20    | 32  | TC.. 16T3...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| ST.. L/R.. 09                     | -                          | SS 5151              | -                                       | KS 5151              | S 5151                                 |
| ST.. L/R.. 11                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| ST.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 5511                                 | KS 1115              | S 5516                                 |

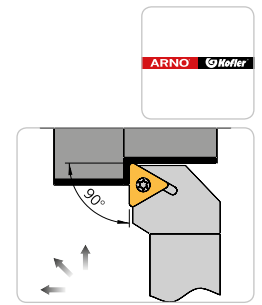
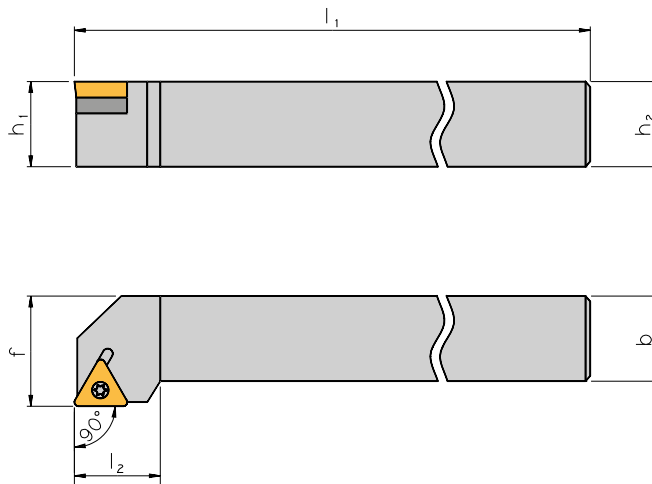
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**STGC L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| STGCL/R 1010 E09                   | 10          | 10  | 70    | 12    | 12  | TC.. 0902...                |
| STGCL/R 1212 F11                   | 12          | 12  | 80    | 15    | 16  | TC.. 1102...                |
| STGCL/R 1616 H16                   | 16          | 16  | 100   | 22    | 20  | TC.. 16T3...                |
| STGCL/R 2020 K16                   | 20          | 20  | 125   | 22    | 25  | TC.. 16T3...                |
| STGCL/R 2525 M16                   | 25          | 25  | 150   | 22    | 32  | TC.. 16T3...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| ST.. L/R.. 09                     | -                          | SS 5151              | -                                       | KS 5151              | S 5151                                 |
| ST.. L/R.. 11                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| ST.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 5511                                 | KS 1115              | S 5516                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

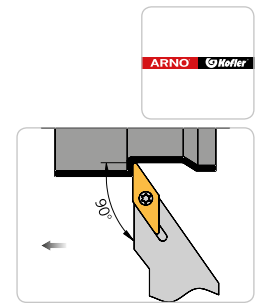
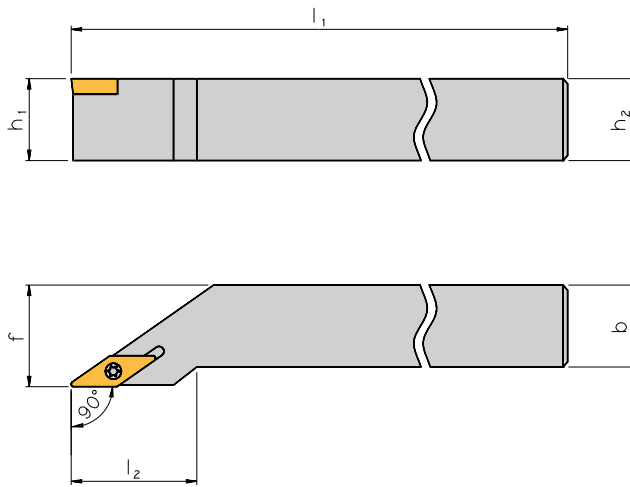
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SVGC L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

**Holders / Utensili / Porte-outils**

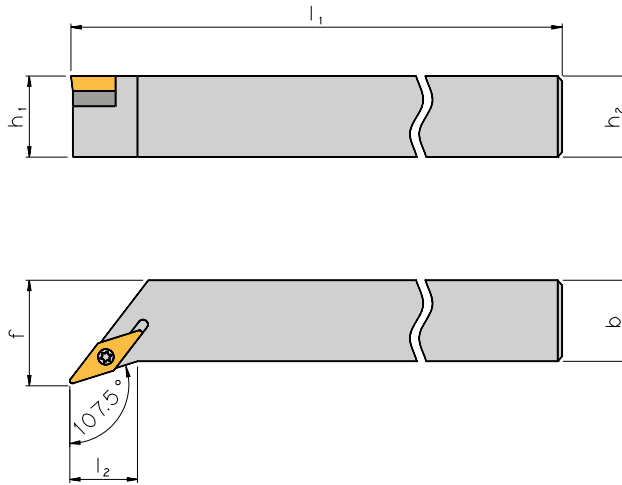
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| SVGCL/R 0808 K07                   | 8           | 8   | 125   | 15    | 8,5  | VC.. 0702...                |
| SVGCL/R 1010 M07                   | 10          | 10  | 150   | 15    | 10,5 | VC.. 0702...                |
| SVGCL/R 1212 M07                   | 12          | 12  | 150   | 18    | 12,5 | VC.. 0702...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SV.. L/R.. 07                     | SS 5140              | KS 1886              |

**SVHC L/R**

Approach angle 107,5° / Angolo di attacco 107,5° / Angle d'attaque 107,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | h <sub>1</sub> / h <sub>2</sub> | b  | l <sub>1</sub> | l <sub>2</sub> | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------------------------|----|----------------|----------------|----|-----------------------------|
| SVHCL/R 1212 F11                   | 12                              | 12 | 80             | 11,4           | 16 | VC.. 1103...                |
| SVHCL/R 1616 H11                   | 16                              | 16 | 100            | 11,4           | 20 | VC.. 1103...                |
| SVHCL/R 2020 K11                   | 20                              | 20 | 125            | 14,6           | 25 | VC.. 1103...                |
| SVHCL/R 2020 K13                   | 20                              | 20 | 125            | 13,2           | 25 | VC.. 1303...                |
| SVHCL/R 2020 K16                   | 20                              | 20 | 125            | 13,2           | 25 | VC.. 1604...                |
| SVHCL/R 2020 K22                   | 20                              | 20 | 125            | 13,2           | 25 | VC.. 2205...                |
| SVHCL/R 2525 M11                   | 25                              | 25 | 150            | 20,9           | 32 | VC.. 1103...                |
| SVHCL/R 2525 M13                   | 25                              | 25 | 150            | 19,6           | 32 | VC.. 1303...                |
| SVHCL/R 2525 M16                   | 25                              | 25 | 150            | 19,6           | 32 | VC.. 1604...                |
| SVHCL/R 2525 M22                   | 25                              | 25 | 150            | 19,6           | 32 | VC.. 2205...                |
| SVHCL/R 3225 P16                   | 32                              | 25 | 170            | 19,6           | 32 | VC.. 1604...                |
| SVHCL/R 3225 P22                   | 32                              | 25 | 170            | 19,6           | 32 | VC.. 2205...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme      |
|-----------------------------------|----------------------------|----------------------|---|----------------------|---|
| SV.. L/R.. 11                     | -                          | SS 1751              | -   | KS 1751              | S 1751                                      |
| SV.. L/R.. 13                     | -                          | SS 8831              | -   | KS 1751              | S 8831                                      |
| SV.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | KS 1115              | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup> |
| SV.. L/R.. 22                     | GBS 1221                   | SS 1221              | US 6641                                       | KS 1115              | S 6646                                      |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

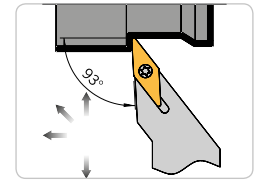
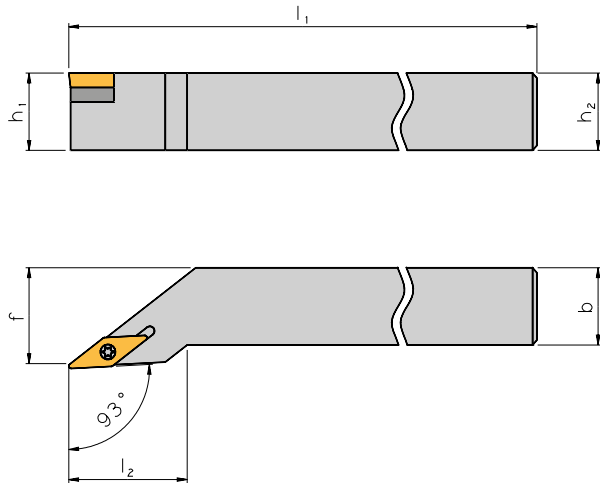
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola  
L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

- 1) For indexable inserts with radius up to 0.8 mm  
Per inserti con un raggio fino a 0,8 mm  
Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm
- 2) For indexable inserts with radius greater than 0.8 mm  
Per inserti con un raggio maggiore di 0,8 mm  
Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

**SVJC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

Holder / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| SVJCL/R 1212 F11                   | 12          | 12 | 80    | 21,5  | 16 | VC.. 1103...                |
| SVJCL/R 1616 H11                   | 16          | 16 | 100   | 21,5  | 20 | VC.. 1103...                |
| SVJCL/R 1616 H16                   | 16          | 16 | 100   | 21,5  | 20 | VC.. 1604...                |
| SVJCL/R 2020 K11                   | 20          | 20 | 125   | 23,0  | 25 | VC.. 1103...                |
| SVJCL/R 2020 K13                   | 20          | 20 | 125   | 29,5  | 25 | VC.. 1303...                |
| SVJCL/R 2020 K16                   | 20          | 20 | 125   | 29,5  | 25 | VC.. 1604...                |
| SVJCL/R 2525 M11                   | 25          | 25 | 150   | 25,5  | 32 | VC.. 1103...                |
| SVJCL/R 2525 M13                   | 25          | 25 | 150   | 25,5  | 32 | VC.. 1303...                |
| SVJCL/R 2525 M16                   | 25          | 25 | 150   | 32,5  | 32 | VC.. 1604...                |
| SVJCL/R 3225 P16                   | 32          | 25 | 170   | 32,5  | 32 | VC.. 1604...                |

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme      |
|-----------------------------------|----------------------------|----------------------|---|----------------------|---|
| SV.. L/R.. 11                     | -                          | SS 1751              | -   | KS 1751              | S 1751                                      |
| SV.. L/R.. 13                     | -                          | SS 8831              | -   | KS 1751              | S 8831                                      |
| SV.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | KS 1115              | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup> |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

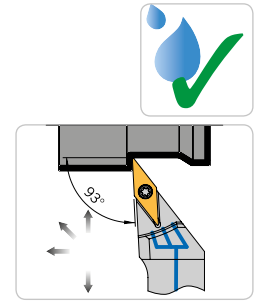
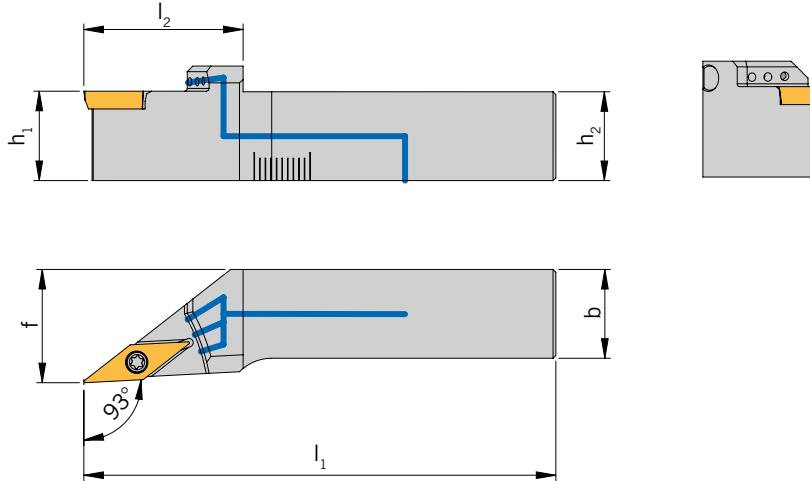
**SVJCR**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°

Tool holders with IK-UN - special for INDEX / TRAUB TNL18 / TNL20 / TNL 32 /

Utensile con IK-UN - specifico per INDEX / TRAUB TNL18 / TNL20 / TNL 32 /

Porte-outils avec IK-UN - spécifiques à INDEX/TRAUB TNL18/TNL20/TNL 32



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|------|-----------------------------|
| SVJCR 1616 X11- <b>IK-UN-TR</b>    | 16          | 16  | 84,5  | 28,5  | 20,3 | VC..1103                    |

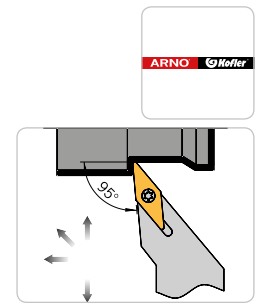
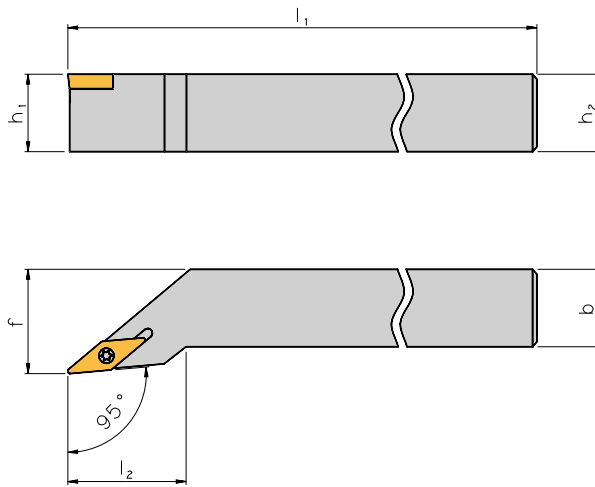
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SVJCR...X11...                    | SS 1751              | KS 1751              |

## SVLC L/R

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

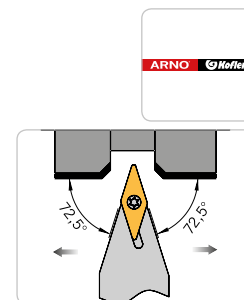
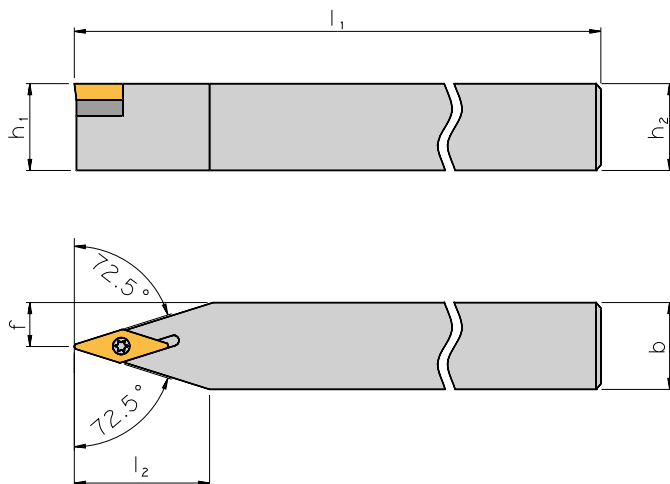
| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SVLCL/R 0808 D07                   | 8           | 8   | 60    | 15    | 10  | VC.. 0702...                |
| SVLCL/R 1010 E07                   | 10          | 10  | 70    | 15    | 12  | VC.. 0702...                |
| SVLCL/R 1212 F07                   | 12          | 12  | 80    | 18    | 16  | VC.. 0702...                |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SV.. L/R.. 07                     | SS 5140              | KS 1886              |

## SVVC N

Approach angle 72,5° / Angolo di attacco 72,5° / Angle d'attaque 72,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



1

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f_1$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-------|-----------------------------|
| SVVCN 0808 K07                     | 8           | 8   | 125   | 15    | 4,0   | VC.. 0702...                |
| SVVCN 1010 M07                     | 10          | 10  | 150   | 16    | 5,0   | VC.. 0702...                |
| SVVCN 1212 F11                     | 12          | 12  | 80    | 19    | 6,0   | VC.. 1103...                |
| SVVCN 1212 M07                     | 12          | 12  | 150   | 19    | 6,0   | VC.. 0702...                |
| SVVCN 1616 H11                     | 16          | 16  | 100   | 25    | 8,0   | VC.. 1103...                |
| SVVCN 1616 H16                     | 16          | 16  | 100   | 25    | 8,0   | VC.. 1604...                |
| SVVCN 2020 K11                     | 20          | 20  | 125   | 32    | 10,0  | VC.. 1103...                |
| SVVCN 2020 K13                     | 20          | 20  | 125   | 32    | 10,0  | VC.. 1303...                |
| SVVCN 2020 K16                     | 20          | 20  | 125   | 32    | 10,0  | VC.. 1604...                |
| SVVCN 2525 M11                     | 25          | 25  | 150   | 40    | 12,5  | VC.. 1103...                |
| SVVCN 2525 M13                     | 25          | 25  | 150   | 40    | 12,5  | VC.. 1303...                |
| SVVCN 2525 M16                     | 25          | 25  | 150   | 40    | 12,5  | VC.. 1604...                |
| SVVCN 3225 P16                     | 32          | 25  | 170   | 40    | 12,5  | VC.. 1604...                |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme      |
|-----------------------------------|----------------------------|----------------------|---|----------------------|---|
| SV.. N.. 07                       | -                          | SS 5140              | -   | KS 1886              | -   |
| SV.. N.. 11                       | -                          | SS 1751              | -   | KS 1751              | -   |
| SV.. N.. 13                       | -                          | SS 8831              | -   | KS 1751              | S 8831                                      |
| SV.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | KS 1115              | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup> |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

#### 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

#### 2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm



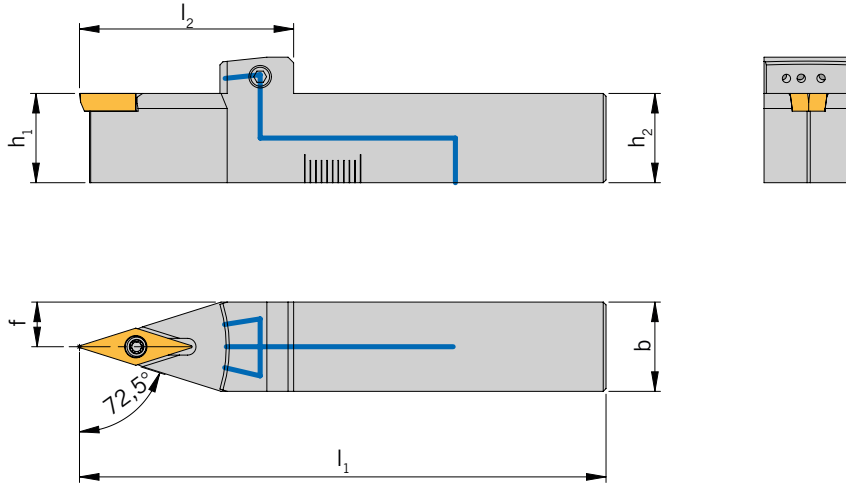
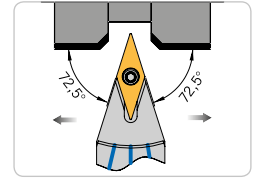
**SVVCN**

Approach angle **72,5°** / Angolo di attacco 72,5° / Angle d'attaque 72,5°

Tool holders with **IK-UN** - special for **INDEX / TRAUB TNL18 / TNL20 / TNL 32** /

Utensile con **IK-UN** - specifico per **INDEX / TRAUB TNL18 / TNL20 / TNL 32** /

Porte-outils avec **IK-UN** - spécifiques à **INDEX/TRAUB TNL18/TNL20/TNL 32**



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| <b>SVVCN 1616X11-IK-UN-TR</b>      | 16          | 16  | 94,5  | 38,5  | 8   | VC..1103                    |

**Spare Parts / Ricambi / Pièces de rechange**

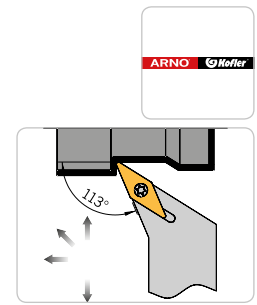
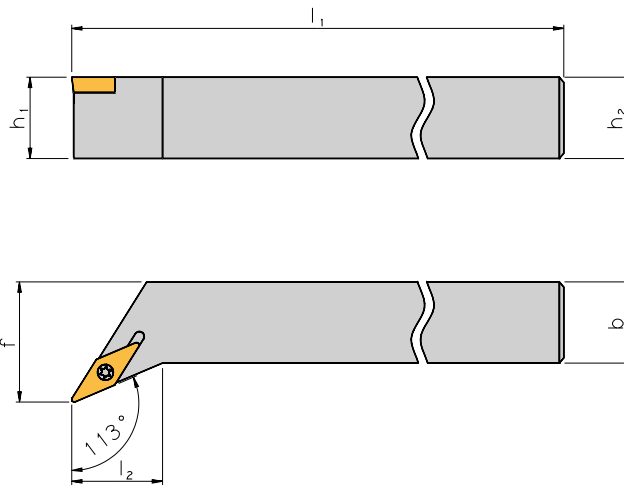
| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| <b>SVVCN...X11...</b>             | SS 1751              | KS 1751              |

1

**SVXC L/R**

Approach angle 113° / Angolo di attacco 113° / Angle d'attaque 113°

With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

1

**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|-----------------------------|
| SVXCL/R 0808 D07                   | 8           | 8   | 60    | 15    | 10  | VC.. 0702...                |
| SVXCL/R 1010 E07                   | 10          | 10  | 70    | 15    | 12  | VC.. 0702...                |
| SVXCL/R 1212 F07                   | 12          | 12  | 80    | 18    | 16  | VC.. 0702...                |

**Spare Parts / Ricambi / Pièces de rechange**

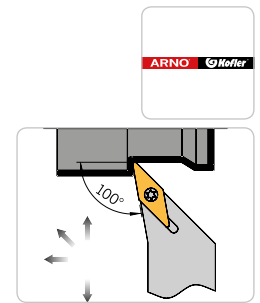
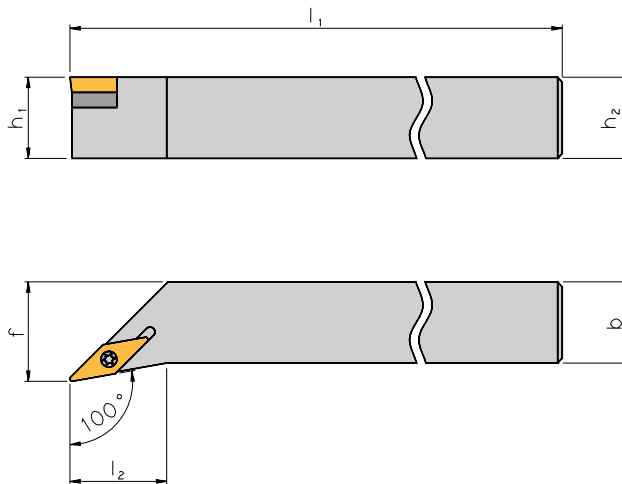
| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| SV.. L/R.. 07                     | SS 5140              | KS 1886              |

## SVZC L/R

Approach angle 100° / Angolo di attacco 100° / Angle d'attaque 100°

With screw clamping / Con bloccaggio a vite / Avec serrage par vis

1



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | $b$ | $l_1$ | $l_2$ | $f$ | Insert<br>Inserito<br>Insert |
|------------------------------------|-------------|-----|-------|-------|-----|------------------------------|
| SVZCL/R 2525 M16                   | 25          | 25  | 150   | 28,5  | 32  | VC.. 1604...                 |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme      |
|-----------------------------------|----------------------------|----------------------|---|----------------------|---|
| SV.. L/R.. 16                     | GBS 1111                   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | KS 1115              | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup> |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

## 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

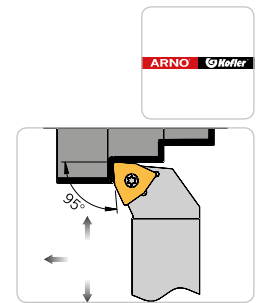
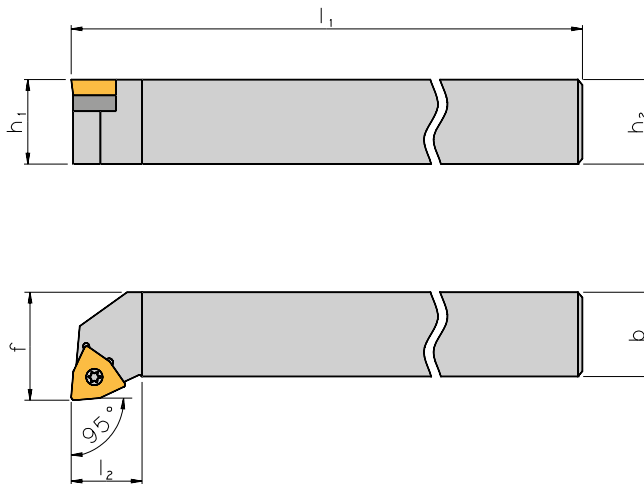
## 2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

## SWLC L/R

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h_1 / h_2$ | b  | $l_1$ | $l_2$ | f  | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------|----|-------|-------|----|-----------------------------|
| SWLCL/R 1010 E04                   | 10          | 10 | 70    | 9     | 12 | WC.. 0402...                |
| SWLCL/R 1212 F06                   | 12          | 12 | 80    | 14    | 16 | WC.. 06T3...                |
| SWLCL/R 1616 H06                   | 16          | 16 | 100   | 16    | 20 | WC.. 06T3...                |
| SWLCR 1616 H08                     | 16          | 16 | 100   | 17    | 20 | WC.. 0804...                |
| SWLCL/R 2020 K06                   | 20          | 20 | 125   | 16    | 25 | WC.. 06T3...                |
| SWLCL/R 2020 K08                   | 20          | 20 | 125   | 18    | 25 | WC.. 0804...                |
| SWLCL/R 2525 M08                   | 25          | 25 | 150   | 21    | 32 | WC.. 0804...                |

### Spare Parts / Ricambi / Pièces de rechange

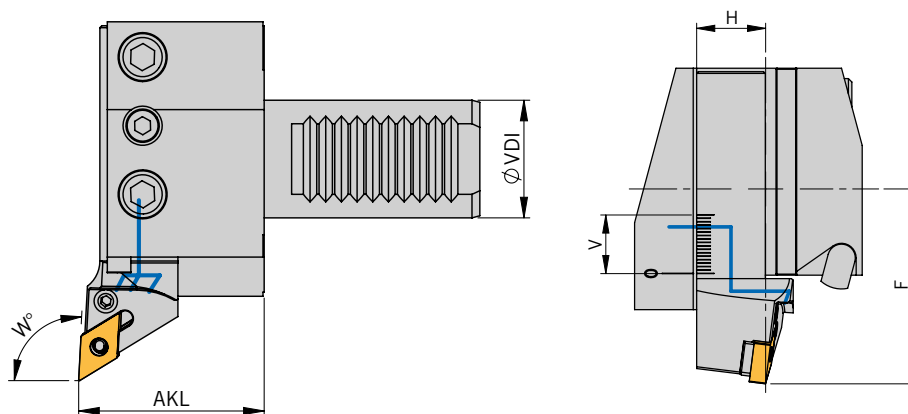
| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| SW.. L/R.. 04                     | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| SW.. L/R.. 08                     | GBS 1221                   | SS 1221              | US 8821                                 | KS 1115              | S 8821                                 |
| SW.. L/R.. 1212.06                | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| SW.. L/R.. 1616-2020.06           | GBS 1111                   | SS 1221              | US 8711                                 | KS 1115              | S 8711                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

## Tool holder with lever lock clamping on KMH01 - Form B / Steli con bloccaggio a leva sul adattatore KMH01 - Forma B / Support de serrage ISO IK-UN avec serrage par levier à genouillère sur KMH01 - Forme B



**HANDLING:** Please select the KMH holder (VDI) and holder type from table 1. According to holder type please select suitable monoblock holder and insert from table 2.

**GUIDA ALLA LETTURA:** Scegliere l'adattatore KMH (VDI) e tipologia di forma dalla tabella 1. Dalla tabella 2 scegliere il relativo utensile ed inserto.

**MANIPULATION:** Sélectionner le porte-outils KMH (VDI) nécessaire et le modèle de support dans le tableau 1. À l'aide du tableau 2, déterminer le support monobloc nécessaire et la plaquette de coupe en fonction du modèle de support.

Table 1 / Tabella 1 / Table 1

### KMH holder - Form B for HSA..-ACS1-UN / Adattatore KMH - Forma B per HSA..-ASC1-UN / Porte-outils KMH - forme B pour support de serrage ISO ..-IK-UN

| Form<br>Forma<br>Forme | VDI | H <sub>Shank</sub><br>H <sub>Stelo</sub><br>H <sub>Tige</sub> | AKL  | V' | KMH Holder (VDI)<br>Adattatore KMH (VDI)<br>Adaptateur KMH (VDI) | Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs |
|------------------------|-----|---|------|----|--|---|
| B1                     | 20  | 16  | 36,3 | 15 | KMH01-B1-20X16X30-IK   | ... 1616 L  |
|                        | 25  | 16  | 36,3 | 15 | KMH01-B1-25X16X30-IK   | ... 1616 L  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B1-30X20X40-IK   | ... 2020 L  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B1-40X25X44-IK   | ... 2525 L  |
| B2                     | 25  | 16  | 36,3 | 15 | KMH01-B2-25X16X30-IK   | ... 1616 R  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B2-30X20X40-IK   | ... 2020 R  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B2-40X25X44-IK   | ... 2525 R  |
| B3                     | 25  | 16  | 36,3 | 15 | KMH01-B3-25X16X30-IK   | ... 1616 R  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B3-30X20X40-IK   | ... 2020 R  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B3-40X25X44-IK   | ... 2525 R  |
| B4                     | 25  | 16  | 36,3 | 15 | KMH01-B4-25X16X30-IK   | ... 1616 L  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B4-30X20X40-IK   | ... 2020 L  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B4-40X25X44-IK   | ... 2525 L  |

\* The holder be adjusted forward bei the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „F“ dimension changes accordingly.

\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.

\* Il est possible de pousser le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « F » varie en conséquence.

Table 2 / Tabella 2 / Table 2

Holders / Utensili / Porte-outils

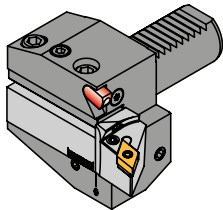
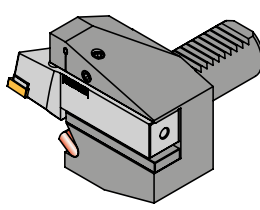
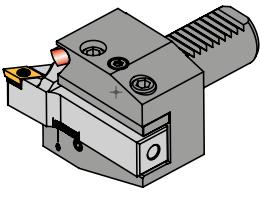
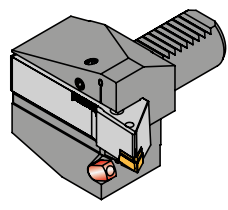
| Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs | Designation<br>Articolo<br>Article | F    | W  | H  | Insert<br>Inserto<br>Insert |
|---|------------------------------------|------|----|----|-----------------------------|
| ... 1616 L  | PCLNL 1616 X12-IK-UN               | 56,0 | 95 | 16 | CN...1204...                |
|   | PDJNL 1616 X11-IK-UN               | 54,5 | 93 | 16 | DN...1104...                |
| ... 1616 R  | PCLNR 1616 X12-IK-UN               | 56,0 | 95 | 16 | CN...1204...                |
|   | PDJNR 1616 X11-IK-UN               | 54,5 | 93 | 16 | DN...1104...                |
| ... 2020 L  | PCLNL 2020 X12-IK-UN               | 61,0 | 95 | 20 | CN...1204...                |
|   | PDJNL 2020 X11-IK-UN               | 56,5 | 93 | 20 | DN...1104...                |
|   | PDJNL 2020 X15-IK-UN               | 66,0 | 93 | 20 | DN...1506...                |
|   | PWLNL 2020 X08-IK-UN               | 51,0 | 95 | 20 | WN...0804...                |
| ... 2020 R  | PCLNR 2020 X12-IK-UN               | 61,0 | 95 | 20 | CN...1204...                |
|   | PDJNR 2020 X11-IK-UN               | 56,5 | 93 | 20 | DN...1104...                |
|   | PDJNR 2020 X15-IK-UN               | 66,0 | 93 | 20 | DN...1506...                |
|   | PWLNR 2020 X08-IK-UN               | 51,0 | 95 | 20 | WN...0804...                |
| ... 2525 L  | PCLNL 2525 X12-IK-UN               | 57,0 | 95 | 25 | CN...1204...                |
|   | PCLNL 2525 X16-IK-UN               | 64,5 | 95 | 25 | CN...1606...                |
|   | PDJNL 2525 X11-IK-UN               | 61,5 | 93 | 25 | DN...1104...                |
|   | PDJNL 2525 X15-IK-UN               | 71,0 | 93 | 25 | DN...1506...                |
|   | PWLNL 2525 X08-IK-UN               | 57,0 | 95 | 25 | WN...0804...                |
| ... 2525 R  | PCLNR 2525 X12-IK-UN               | 57,0 | 95 | 25 | CN...1204...                |
|   | PCLNR 2525 X16-IK-UN               | 64,5 | 95 | 25 | CN...1606...                |
|   | PDJNR 2525 X11-IK-UN               | 61,5 | 93 | 25 | DN...1104...                |
|   | PDJNR 2525 X15-IK-UN               | 71,0 | 93 | 25 | DN...1506...                |
|   | PWLNR 2525 X08-IK-UN               | 57,0 | 95 | 25 | WN...0804...                |

1

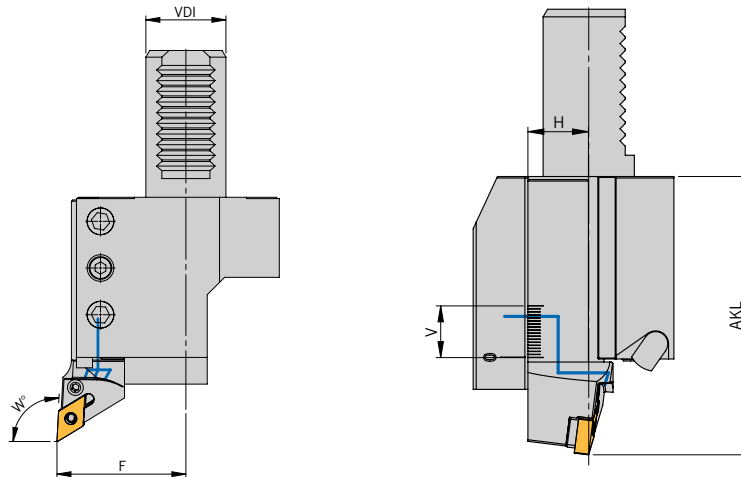
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Hollow pin<br>Spina elastica<br>Goupille tubulaire | Toggle<br>Leva articolata<br>Lever à genouillère | Assembly pin<br>Spina di montaggio<br>Broche de montage |
|-----------------------------------|----------------------|---|--|--|---|
| PCLN.. X12-IK-UN                  | SP 1111              | UP 1111                                 | RP 1111  | HP 1111  | MP 1111   |
| PCLN.. X16-IK-UN                  | SP 1221              | UP 1221                                 | RP 1221  | HP 1221  | MP 1221   |
| PDJN.. X11-IK-UN                  | SP 3111              | UP 2011                                 | RP 3112  | HP 2011  | MP 3111   |
| PDJN.. X15-IK-UN                  | SP 1111              | UP 2421                                 | RP 1111  | HP 2421  | MP 1111   |
| PWLN.. X08-IK-UN                  | SP 1111              | UP 71011                                | RP 1111  | HP 1111  | MP 1111   |

Assembly options / Combinazioni di montaggio / Options d'assemblage

| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec porte-outil à droite |   |
|---|---|---|---|
| KMH01-B1-...-IK   | KMH01-B4-...-IK   | KMH01-B2-...-IK   | KMH01-B3-...-IK   |
|    |  |                                       |  |
| Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                   | Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                     |

## Tool holder with lever lock clamping on KMH01 - Form C / Steli con bloccaggio a leva sul adattatore KMH01 - Forma C / Porte-outils ISO IK-UN avec serrage par levier sur KMH01 - Forme C



**HANDLING:** Please select the KMH holder (VDI) and holder type from table 1. According to holder type please select suitable monoblock holder and insert from table 2.

**GUIDA ALLA LETTURA:** Scegliere l'adattatore KMH (VDI) e tipologia di forma dalla tabella 1. Dalla tabella 2 scegliere il relativo utensile ed inserto.

**MANIPULATION:** Sélectionner le porte-outils KMH (VDI) nécessaire et le modèle de support dans le tableau 1. À l'aide du tableau 2, déterminer le support monobloc nécessaire et la plaquette de coupe en fonction du modèle de support.

**Table 1 / Tabella 1 / Table 1**

**KMH holder - Form C for tool holder -IK-UN / Adattatore KMH - Forma C per steli -IK-UN / Porte-outils KMH - forme C pour support de serrage ISO ..-IK-UN**

| Form<br>Forma<br>Forme | VDI | H <sub>Shank</sub><br>H <sub>Stelo</sub><br>H <sub>Tige</sub> | F    | V* | KMH Holder (VDI)<br>Adattatore KMH (VDI)<br>Adaptateur KMH (VDI) | Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs |
|------------------------|-----|---|------|----|--|---|
| <b>C1</b>              | 25  | 16  | 39.3 | 15 | KMH01-C1-25X16X55-IK   | ... 1616 R  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C1-30X20X70-IK   | ... 2020 R  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C1-40X25X85-IK   | ... 2525 R  |
| <b>C2</b>              | 25  | 16  | 39.3 | 15 | KMH01-C2-25X16X55-IK   | ... 1616 L  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C2-30X20X70-IK   | ... 2020 L  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C2-40X25X85-IK   | ... 2525 L  |
| <b>C3</b>              | 25  | 16  | 39.3 | 15 | KMH01-C3-25X16X55-IK   | ... 1616 L  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C3-30X20X70-IK   | ... 2020 L  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C3-40X25X85-IK   | ... 2525 L  |
| <b>C4</b>              | 25  | 16  | 39.3 | 15 | KMH01-C4-25X16X55-IK   | ... 1616 R  |
|                        | 25  | 20  | 48.3 | 17 | KMH01-C4-25X20X70-IK   | ... 2020 R  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C4-30X20X70-IK   | ... 2020 R  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C4-40X25X85-IK   | ... 2525 R  |

\* The holder be adjusted forward bei the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „F“ dimension changes accordingly.

\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.

\* Il est possible de pousser le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « F » varie en conséquence.

Table 2 / Tabella 2 / Table 2

Holders / Utensili / Porte-outils

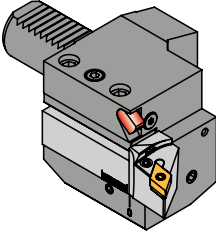
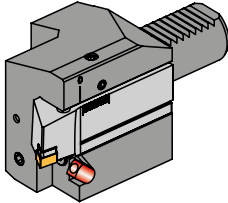
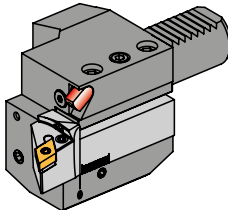
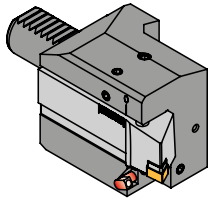
| Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs | Designation<br>Articolo<br>Article | AKL   | W  | H  | Insert<br>Inserto<br>Insert |
|---|------------------------------------|-------|----|----|-----------------------------|
| ... 1616 L  | PCLNL 1616 X12-IK-UN               | 81,0  | 95 | 16 | CN...1204...                |
|   | PDJNL 1616 X11-IK-UN               | 79,5  | 93 | 16 | DN...1104...                |
| ... 1616 R  | PCLNR 1616 X12-IK-UN               | 81,0  | 95 | 16 | CN...1204...                |
|   | PDJNR 1616 X11-IK-UN               | 79,5  | 93 | 16 | DN...1104...                |
| ... 2020 L  | PCLNL 2020 X12-IK-UN               | 96,0  | 95 | 20 | CN...1204...                |
|   | PDJNL 2020 X11-IK-UN               | 91,5  | 93 | 20 | DN...1104...                |
|   | PDJNL 2020 X15-IK-UN               | 101,0 | 93 | 20 | DN...1506...                |
|   | PVLNL 2020 X08-IK-UN               | 86,0  | 95 | 20 | WN...0804...                |
| ... 2020 R  | PCLNR 2020 X12-IK-UN               | 96,0  | 95 | 20 | CN...1204...                |
|   | PDJNR 2020 X11-IK-UN               | 91,5  | 93 | 20 | DN...1104...                |
|   | PDJNR 2020 X15-IK-UN               | 101,0 | 93 | 20 | DN...1506...                |
|   | PVLNR 2020 X08-IK-UN               | 86,0  | 95 | 20 | WN...0804...                |
| ... 2525 L  | PCLNL 2525 X12-IK-UN               | 99,5  | 95 | 25 | CN...1204...                |
|   | PCLNL 2525 X16-IK-UN               | 107,0 | 95 | 25 | CN...1606...                |
|   | PDJNL 2525 X11-IK-UN               | 104,0 | 93 | 25 | DN...1104...                |
|   | PDJNL 2525 X15-IK-UN               | 113,5 | 93 | 25 | DN...1506...                |
| ... 2525 R  | PVLNL 2525 X08-IK-UN               | 99,5  | 95 | 25 | WN...0804...                |
|   | PCLNR 2525 X12-IK-UN               | 99,5  | 95 | 25 | CN...1204...                |
|   | PCLNR 2525 X16-IK-UN               | 107,0 | 95 | 25 | CN...1606...                |
|   | PDJNR 2525 X11-IK-UN               | 104,0 | 93 | 25 | DN...1104...                |
| ... 2525 R  | PDJNR 2525 X15-IK-UN               | 113,5 | 93 | 25 | DN...1506...                |
|   | PVLNR 2525 X08-IK-UN               | 99,5  | 95 | 25 | WN...0804...                |



Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Hollow pin<br>Spina elastica<br>Goupille tubulaire | Toggle<br>Leva articolata<br>Lever à genouillère | Assembly pin<br>Spina di montaggio<br>Broche de montage |
|-----------------------------------|----------------------|---|--|--|---|
| PCLN.. X12-IK-UN                  | SP 1111              | UP 1111                                 | RP 1111  | HP 1111  | MP 1111   |
| PCLN.. X16-IK-UN                  | SP 1221              | UP 1221                                 | RP 1221  | HP 1221  | MP 1221   |
| PDJN.. X11-IK-UN                  | SP 3111              | UP 2011                                 | RP 3112  | HP 2011  | MP 3111   |
| PDJN.. X15-IK-UN                  | SP 1111              | UP 2421                                 | RP 1111  | HP 2421  | MP 1111   |
| PVLN.. X08-IK-UN                  | SP 1111              | UP 71011                                | RP 1111  | HP 1111  | MP 1111   |

Assembly options / Combinazioni di montaggio / Options d'assemblage

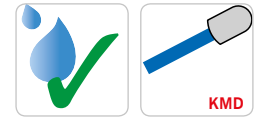
| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec porte-outil à droite |   |
|---|---|---|---|
| KMH01-C2-...-IK   | KMH01-C3-...-IK   | KMH01-C1-...-IK   | KMH01-C4-...-IK   |
|    |  |                                       |  |
| Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                   | Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                     |



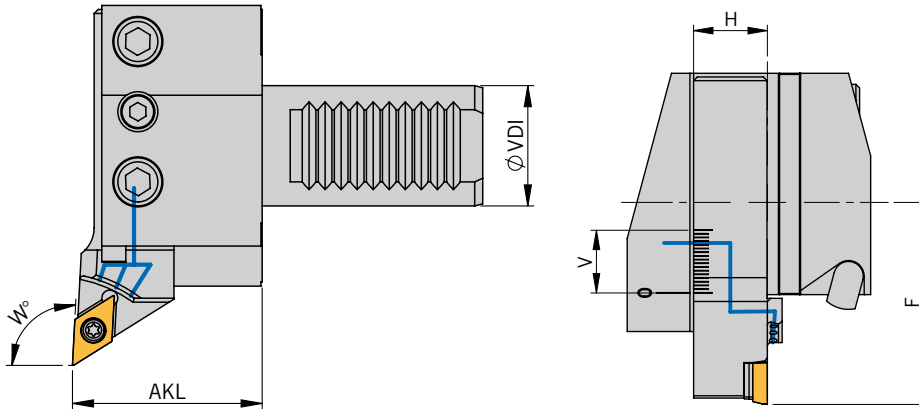
## Tool holder with screw clamping on KMH01 - Form B /

Steli con bloccaggio a leva sul adattatore KMH01 - Forma B /

Porte-outils ISO IK-UN avec serrage par vis sur KMH01 - Forme B



1



**HANDLING:**

Please select the KMH holder (VDI) and holder type from table 1. According to holder type please select suitable monoblock holder and insert from table 2.

**GUIDA ALLA LETTURA:**

Scegliere l'adattatore KMH (VDI) e tipologia di forma dalla tabella 1. Dalla tabella 2 scegliere il relativo utensile ed inserto.

**MANIPULATION:**

Sélectionner le porte-outils KMH (VDI) nécessaire et le modèle de support dans le tableau 1. À l'aide du tableau 2, déterminer le support monobloc nécessaire et la plaquette de coupe en fonction du modèle de support.

**Table 1 / Tabella 1 / Table 1**

**KMH holder - Form B for HSA..-ACS1-UN / Adattatore KMH - Forma B per HSA..-ASC1-UN / Porte-outils KMH - forme B pour support de serrage ISO ..-IK-UN**

| Form<br>Forma<br>Forme | VDI | H <sub>Shank</sub><br>H <sub>Stelo</sub><br>H <sub>Tige</sub> | AKL  | V* | KMH Holder (VDI)<br>Adattatore KMH (VDI)<br>Adaptateur KMH (VDI) | Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs |
|------------------------|-----|---|------|----|--|---|
| B1                     | 20  | 16  | 36,3 | 15 | KMH01-B1-20X16X30-IK   | ... 1616 L  |
|                        | 25  | 16  | 36,3 | 15 | KMH01-B1-25X16X30-IK   | ... 1616 L  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B1-30X20X40-IK   | ... 2020 L  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B1-40X25X44-IK   | ... 2525 L  |
| B2                     | 25  | 16  | 36,3 | 15 | KMH01-B2-25X16X30-IK   | ... 1616 R  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B2-30X20X40-IK   | ... 2020 R  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B2-40X25X44-IK   | ... 2525 R  |
| B3                     | 25  | 16  | 36,3 | 15 | KMH01-B3-25X16X30-IK   | ... 1616 R  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B3-30X20X40-IK   | ... 2020 R  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B3-40X25X44-IK   | ... 2525 R  |
| B4                     | 25  | 16  | 36,3 | 15 | KMH01-B4-25X16X30-IK   | ... 1616 L  |
|                        | 30  | 20  | 47,3 | 17 | KMH01-B4-30X20X40-IK   | ... 2020 L  |
|                        | 40  | 25  | 54,3 | 22 | KMH01-B4-40X25X44-IK   | ... 2525 L  |

\* The holder be adjusted forward bei the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „F“ dimension changes accordingly.

\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.

\* Il est possible de pousser le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « F » varie en conséquence.

**Table 2 / Tabella 2 / Table 2**

**Holders / Utensili / Porte-outils**

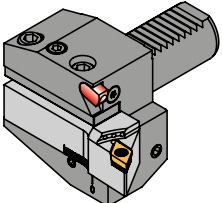
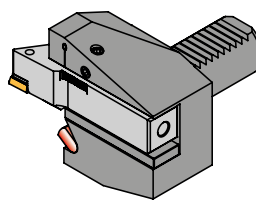
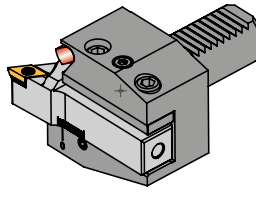
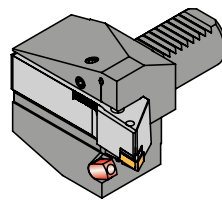
| Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs | Designation<br>Articolo<br>Article | F  | W  | H  | Insert<br>Inserto<br>Insert |
|---|------------------------------------|----|----|----|-----------------------------|
| ... 1616 L  | SCLCL 1616 X09-IK-UN               | 45 | 95 | 16 | CC...09T3...                |
|   | SDJCL 1616 X11-IK-UN               | 52 | 93 | 16 | DC...11T3...                |
|   | SVJCL 1616 X11-IK-UN               | 52 | 93 | 16 | VC...1103...                |
|   | SVJCL 1616 X13-IK-UN               | 59 | 93 | 16 | VC...1303...                |
| ... 1616 R  | SCLCR 1616 X09-IK-UN               | 45 | 95 | 16 | CC...09T3...                |
|   | SDJCR 1616 X11-IK-UN               | 52 | 93 | 16 | DC...11T3...                |
|   | SVJCR 1616 X11-IK-UN               | 52 | 93 | 16 | VC...1103...                |
|   | SVJCR 1616 X13-IK-UN               | 59 | 93 | 16 | VC...1303...                |
| ... 2020 L  | SCLCL 2020 X09-IK-UN               | 47 | 95 | 20 | CC...09T3...                |
|   | SDJCL 2020 X11-IK-UN               | 54 | 93 | 20 | DC...11T3...                |
|   | SVJCL 2020 X11-IK-UN               | 60 | 93 | 20 | VC...1103...                |
|   | SVJCL 2020 X13-IK-UN               | 66 | 93 | 20 | VC...1303...                |
| ... 2020 R  | SCLCL 2020 X16-IK-UN               | 67 | 93 | 20 | VC...1604...                |
|   | SCLCR 2020 X09-IK-UN               | 47 | 95 | 20 | CC...09T3...                |
|   | SCLCR 2020 X09-IK-UN               | 47 | 95 | 20 | CC...09T3...                |
|   | SDJCL 2020 X11-IK-UN               | 54 | 93 | 20 | DC...11T3...                |
|   | SDJCR 2020 X11-IK-UN               | 54 | 93 | 20 | DC...11T3...                |
|   | SVJCL 2020 X11-IK-UN               | 60 | 93 | 20 | VC...1103...                |
|   | SVJCL 2020 X13-IK-UN               | 66 | 93 | 20 | VC...1303...                |
|   | SVJCL 2020 X16-IK-UN               | 67 | 93 | 20 | VC...1604...                |
| ... 2525 L  | SCLCL 2525 X11-IK-UN               | 60 | 93 | 25 | DC...11T3...                |
|   | SVJCL 2525 X16-IK-UN               | 72 | 93 | 25 | VC...1604...                |
|   | SCLCR 2525 X12-IK-UN               | 57 | 95 | 25 | CC...1204...                |
| ... 2525 R  | SDJCR 2525 X11-IK-UN               | 60 | 93 | 25 | DC...11T3...                |
|   | SVJCR 2525 X16-IK-UN               | 72 | 93 | 25 | VC...1604...                |

1

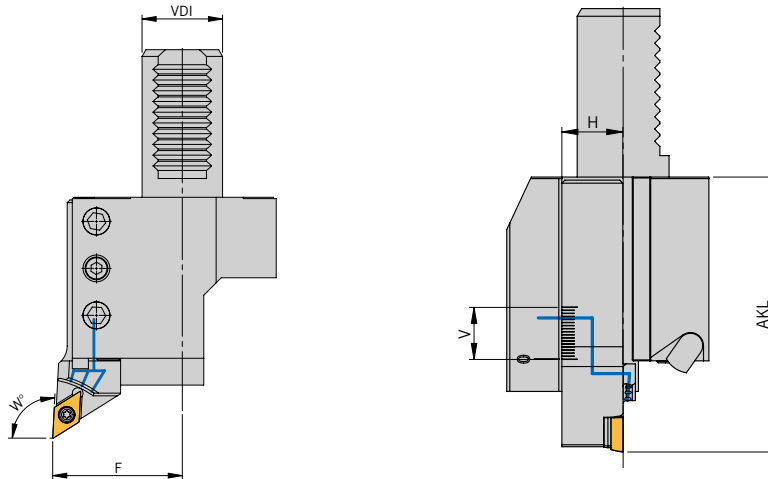
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Support pad<br>Supporto<br>Cale-support | Screw<br>Vite<br>Vis | Threaded bush<br>Boccola filettata<br>Douille filetée |
|-----------------------------------|---|----------------------|---|
| SCLC.. X09-IK-UN                  | US 1111                                 | SS 1111              | GBS 1111  |
| SCLC.. X12-IK-UN                  | US 1221                                 | SS 1221              | GBS 1221  |
| SDJC.. X11-IK-UN                  | US 2311                                 | SS 1111              | GBS 1111  |
| SVJC.. X11-IK-UN                  | -                                       | SS 1751              | -   |
| SVJC.. X13-IK-UN                  | -                                       | SS 8831              | -   |
| SVJC.. X16-IK-UN                  | -                                       | SS 1111              | GBS 1111  |

**Assembly options / Combinazioni di montaggio / Options d'assemblage**

| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec l'outil approprié |   |
|---|---|--|---|
| KMH01-B1-...-IK   | KMH01-B4-...-IK   | KMH01-B2-...-IK  | KMH01-B3-...-IK   |
|    |  |                                    |  |
| <b>Normal assembly</b><br>Montaggio normale<br>Assemblage normal  | <b>Upside down assembly</b><br>Montaggio invertito<br>Assemblage inversé            | <b>Normal assembly</b><br>Montaggio normale<br>Assemblage normal   | <b>Upside down assembly</b><br>Montaggio invertito<br>Assemblage inversé              |

## Tool holder with screw clamping on KMH01 - Form C / Steli con bloccaggio a leva sul adattatore KMH01 - Forma C / Porte-outils ISO IK-UN avec serrage par vis sur KMH01 - Forme C



**HANDLING:** Please select the KMH holder (VDI) and holder type from table 1. According to holder type please select suitable monoblock holder and insert from table 2.

**GUIDA ALLA LETTURA:** Scegliere l'adattatore KMH (VDI) e tipologia di forma dalla tabella 1. Dalla tabella 2 scegliere il relativo utensile ed inserto.

**MANIPULATION:** Sélectionner le porte-outils KMH (VDI) nécessaire et le modèle de support dans le tableau 1. À l'aide du tableau 2, déterminer le support monobloc nécessaire et la plaquette de coupe en fonction du modèle de support.

**Table 1 / Tabella 1 / Table 1**

### KMH holder - Form C for tool holder -IK-UN / Adattatore KMH - Forma C per steli -IK-UN / Porte-outils KMH - forme C pour support de serrage ISO ..-IK-UN

| Form<br>Forma<br>Forme | VDI | H <sub>Shank</sub><br>H <sub>Stelo</sub><br>H <sub>Tige</sub> | F    | V  | KMH Holder (VDI)<br>Adattatore KMH (VDI)<br>Adaptateur KMH (VDI) | Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs |
|------------------------|-----|---|------|----|--|---|
| C1                     | 25  | 16  | 39.3 | 15 | KMH01-C1-25X16X55-IK   | ... 1616 R  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C1-30X20X70-IK   | ... 2020 R  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C1-40X25X85-IK   | ... 2525 R  |
| C2                     | 25  | 16  | 39.3 | 15 | KMH01-C2-25X16X55-IK   | ... 1616 L  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C2-30X20X70-IK   | ... 2020 L  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C2-40X25X85-IK   | ... 2525 L  |
| C3                     | 25  | 16  | 39.3 | 15 | KMH01-C3-25X16X55-IK   | ... 1616 L  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C3-30X20X70-IK   | ... 2020 L  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C3-40X25X85-IK   | ... 2525 L  |
| C4                     | 25  | 16  | 39.3 | 15 | KMH01-C4-25X16X55-IK   | ... 1616 R  |
|                        | 25  | 20  | 48.3 | 17 | KMH01-C4-25X20X70-IK   | ... 2020 R  |
|                        | 30  | 20  | 48.3 | 17 | KMH01-C4-30X20X70-IK   | ... 2020 R  |
|                        | 40  | 25  | 57.8 | 22 | KMH01-C4-40X25X85-IK   | ... 2525 R  |

\* The holder be adjusted forward by the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „AKL“ dimension changes accordingly.  
\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.  
\* Il est possible de régler le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « AKL » varie en conséquence.

**Table 2 / Tabella 2 / Table 2**

**Holders / Utensili / Porte-outils**

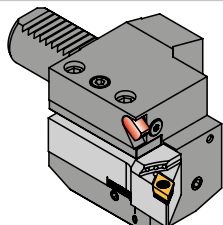
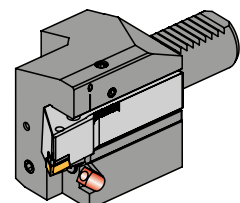
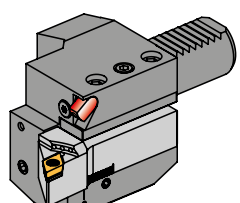
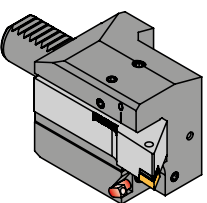
| Monoblock holder<br>Utensili monoblocco<br>Outils monoblocs | Designation<br>Articolo<br>Article | AKL   | W  | H  | Insert<br>Inserto<br>Insert |
|---|------------------------------------|-------|----|----|-----------------------------|
| ... 1616 L  | SCLCL 1616 X09-IK-UN               | 70,0  | 95 | 16 | CC...09T3...                |
|   | SDJCL 1616 X11-IK-UN               | 77,0  | 93 | 16 | DC...11T3...                |
|   | SVJCL 1616 X11-IK-UN               | 77,0  | 93 | 16 | VC...1103...                |
|   | SVJCL 1616 X13-IK-UN               | 59,0  | 93 | 16 | VC...1303...                |
| ... 1616 R  | SCLCR 1616 X09-IK-UN               | 70,0  | 95 | 16 | CC...09T3...                |
|   | SDJCR 1616 X11-IK-UN               | 77,0  | 93 | 16 | DC...11T3...                |
|   | SVJCR 1616 X11-IK-UN               | 77,0  | 93 | 16 | VC...1103...                |
|   | SVJCR 1616 X13-IK-UN               | 59,0  | 93 | 16 | VC...1303...                |
| ... 2020 L  | SCLCL 2020 X09-IK-UN               | 82,0  | 95 | 20 | CC...09T3...                |
|   | SDJCL 2020 X11-IK-UN               | 89,0  | 93 | 20 | DC...11T3...                |
|   | SVJCL 2020 X11-IK-UN               | 95,0  | 93 | 20 | VC...1103...                |
|   | SVJCL 2020 X13-IK-UN               | 66,0  | 93 | 20 | VC...1303...                |
| ... 2020 R  | SVJCL 2020 X16-IK-UN               | 102,0 | 93 | 20 | VC...1604...                |
|   | SCLCR 2020 X09-IK-UN               | 82,0  | 95 | 20 | CC...09T3...                |
|   | SDJCR 2020 X11-IK-UN               | 89,0  | 93 | 20 | DC...11T3...                |
|   | SVJCR 2020 X11-IK-UN               | 95,0  | 93 | 20 | VC...1103...                |
|   | SVJCR 2020 X16-IK-UN               | 102,0 | 93 | 20 | VC...1604...                |
|   | SVJCR 2020 X16-IK-UN               | 66,0  | 93 | 20 | VC...1604...                |
|   | SVJCR 2020 X16-IK-UN               | 66,0  | 93 | 20 | VC...1604...                |
|   | SVJCR 2020 X16-IK-UN               | 66,0  | 93 | 20 | VC...1604...                |
| ... 2525 L  | SCLCL 2525 X12-IK-UN               | 99,5  | 95 | 25 | CC...1204...                |
|   | SDJCL 2525 X11-IK-UN               | 102,5 | 93 | 25 | DC...11T3...                |
|   | SVJCL 2525 X16-IK-UN               | 114,5 | 93 | 25 | VC...1604...                |
| ... 2525 R  | SCLCR 2525 X12-IK-UN               | 99,5  | 95 | 25 | CC...1204...                |
|   | SDJCR 2525 X11-IK-UN               | 102,5 | 93 | 25 | DC...11T3...                |
|   | SVJCR 2525 X16-IK-UN               | 114,5 | 93 | 25 | VC...1604...                |

1

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Support pad<br>Supporto<br>Cale-support | Screw<br>Vite<br>Vis | Threaded bush<br>Boccola filettata<br>Douille filetée |
|-----------------------------------|---|----------------------|---|
| SCLC.. X09-IK-UN                  | US 1111                                 | SS 1111              | GBS 1111  |
| SCLC.. X12-IK-UN                  | US 1221                                 | SS 1221              | GBS 1221  |
| SDJC.. X11-IK-UN                  | US 2311                                 | SS 1111              | GBS 1111  |
| SVJC.. X11-IK-UN                  | -                                       | SS 1751              | -   |
| SVJC.. X13-IK-UN                  | -                                       | SS 8831              | -   |
| SVJC.. X16-IK-UN                  | -                                       | SS 1111              | GBS 1111  |

**Assembly options / Combinazioni di montaggio / Options d'assemblage**

| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec porte-outil à droite |   |
|---|---|---|---|
| KMH01-C2-...-IK   | KMH01-C3-...-IK   | KMH01-C1-...-IK   | KMH01-C4-...-IK   |
|    |  |                                       |  |
| Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                   | Normal assembly<br>Montaggio normale<br>Assemblage normal   | Upside down assembly<br>Montaggio invertito<br>Assemblage inversé                     |

**Basic holder TNL18/TNL20/TNL32 - with internal coolant**

Attacco base TNL18 / TNL20 / TNL32 – con raffreddamento interno

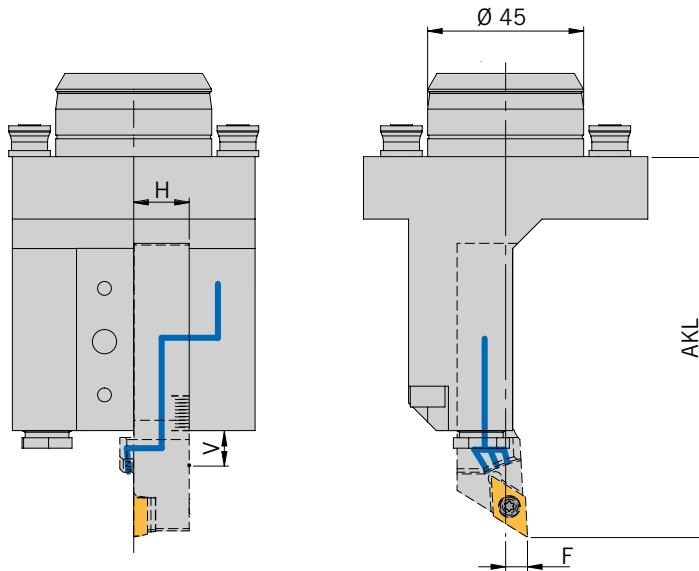
Supports de base TNL18/TNL20/TNL32 – avec refroidissement interne



For IK-UN-TR tool holders / Per steli in esecuzione IK-UN-TR /

Pour support de serrage du modèle IK-UN-TR

1



Attachment W7040055 shown with tool holder SDJCR 1616X11-*IK-UN-TR*

Attacco base W7040055 con utensile SDJCR 1616X11-*IK-UN-TR* rappresentato in figura

Support W7040055 avec support de serrage SDJCR 1616X11-*IK-UN-TR* illustré

Holders / Utensili / Porte-outils

|  |  |
|--|--|
| Basic holder W7040055<br>Attacco base W7040055<br>Support de base W7040055 | Basic holder W7040056<br>Attacco base W7040056<br>Support de base W7040056 |
|--|--|

| Designation / Articolo / Article | H <sub>Shank / Stelo / tige</sub> | V* | AKL   | F    | AKL   | F    |
|----------------------------------|-----------------------------------|----|-------|------|-------|------|
| SCLCR 1616X09- <i>IK-UN-TR</i>   | 16                                | 10 | 102,0 | 6,3  | 102,0 | 6,3  |
| SDJCR 1616X11- <i>IK-UN-TR</i>   | 16                                | 10 | 119,5 | 6,3  | 119,5 | 6,3  |
| SVJCR 1616X11- <i>IK-UN-TR</i>   | 16                                | 10 | 119,5 | 6,3  | 119,5 | 6,3  |
| SVVCN 1616X11- <i>IK-UN-TR</i>   | 16                                | 10 | 129,5 | -6,0 | 129,5 | -6,0 |
| AL 16-3-R- <i>IK-UN-TR</i>       | 16                                | 10 | 102,5 | 1,3  | 102,5 | 1,3  |

\* The holder can be extended by dimension "V" value in the attachment.

• Basic holders are available from the machine manufacturers.

The coolant supply guaranteed within the adjustment range. The "AKL" dimension changes accordingly.

Overhang (AKL) and F dimensions are available for other basic holders on request. Perfect coolant transfer cannot be guaranteed on other basic holders.

\* L'utensile può avanzare del valore "V".

• Gli attacchi base sono disponibili presso il produttore delle macchine.

L'alimentazione del liquido refrigerante è garantita all'interno della corsa "V". La misura "AKL" si modifica di conseguenza.

Le misure AKL e F sono disponibili a richiesta per altri utensili. Per gli altri utensili non è possibile garantire un passaggio ottimale del liquido refrigerante.

\* Il est possible de pousser le support vers l'avant du logement sur une distance egale a la valeur « V ».

• Les supports de base sont disponibles aupres du fabricant de machines !

L'alimentation en fluide de refroidissement est assurée dans la course de déplacement. La dimension « AKL » varie en consequence.

Dimensions AKL et F disponibles pour d'autres supports de base sur demande. Il est impossible de garantir une transmission optimale du fluide de refroidissement avec d'autres supports de base.



## Set 1

Adjustable from 0,6 Nm – 1,5 Nm

Registrabile da 0,6 Nm a 1,5 Nm

Plage de réglage de 0,6 Nm – 1,5 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T6, Torx T7,  
Torx T8 and Torx T9
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T6, Torx T7,  
Torx T8, Torx T9
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique  
avec embout Torx T6, Torx T7, Torx T8  
et Torx T9
- 1 Clé de réglage

(Order as: **Set-Drehmoment 1**)

(Esempio di ordinazione: **Set-Drehmoment 1**)

(Référence de commande : **Set-Drehmoment 1**)

## Set 2

Adjustable from 1,5 Nm – 3,0 Nm

Registrabile da 1,5 Nm a 3,0 Nm

Plage de réglage de 1,5 Nm – 3,0 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T9, Torx T10  
and Torx T15
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T9, Torx T10,  
Torx T15
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique  
avec embout Torx T9, Torx T10  
et Torx T15
- 1 Clé de réglage

(Order as: **Set-Drehmoment 2**)

(Esempio di ordinazione: **Set-Drehmoment 2**)

(Référence de commande : **Set-Drehmoment 2**)

## Set 3

Adjustable from 3,0 Nm – 5,4 Nm

Registrabile da 3,0 Nm a 5,4 Nm

Plage de réglage de 3,0 Nm – 5,4 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T10, Torx T15  
and Torx T20
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T10, Torx T15,  
Torx T20
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique  
avec embout Torx T10, Torx T15  
et Torx T20
- 1 Clé de réglage

(Order as: **Set-Drehmoment 3**)

(Esempio di ordinazione: **Set-Drehmoment 3**)

(Référence de commande : **Set-Drehmoment 3**)

## Recommended torque settings for indexable inserts

Momenti torcenti raccomandati per viti

Couples de serrage recommandés pour vis de plaquette

| Thread<br>Filetto vite<br>Filetage | Torx size<br>Dimensione Torx<br>Dimension | max. torque<br>Momento torcente<br>Couple de serrage max. |
|------------------------------------|---|---|
| M1,8                               | T6  | 0,6 Nm  |
| M2                                 | T6  | 0,6 Nm  |
| M2                                 | T7  | 0,6 Nm  |
| M2,2                               | T6  | 1,0 Nm  |
| M2,2                               | T7  | 1,0 Nm  |
| M2,2                               | T8  | 1,3 Nm  |
| M3                                 | T8  | 2,2 Nm  |
| M3                                 | T9  | 2,2 Nm  |
| M3,5                               | T15                                       | 3,4 Nm  |
| M4                                 | T15                                       | 5,1 Nm  |
| M4,5                               | T20                                       | 6,2 Nm  |
| M5                                 | T20                                       | 6,2 Nm  |
| M6                                 | T25                                       | 8,1 Nm  |

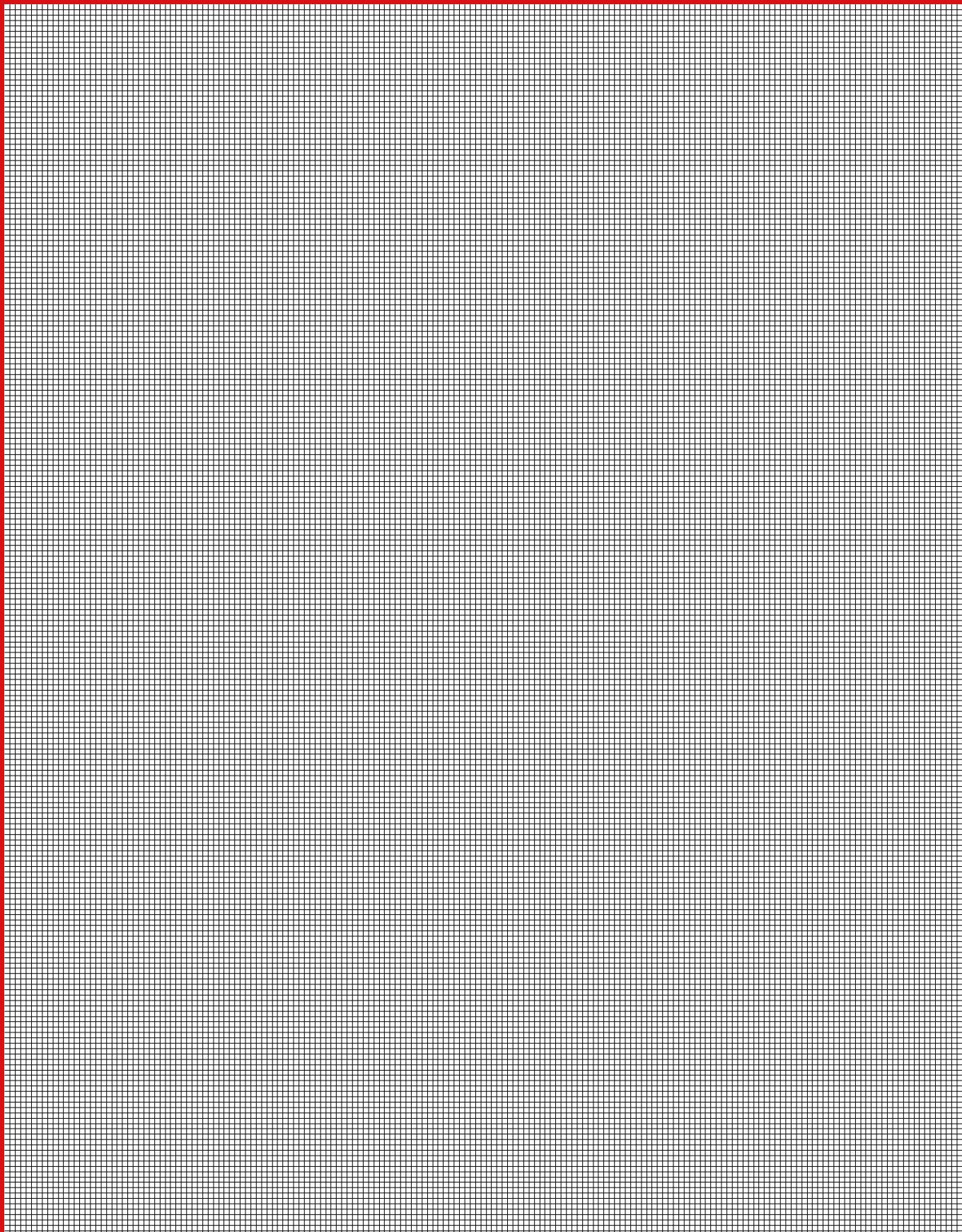
**For more information see**

*Per maggiori informazioni visita il sito*

Vous trouverez de plus amples informations sur



[www.arno.de](http://www.arno.de)



# INTERNAL MACHINING

## Internal machining

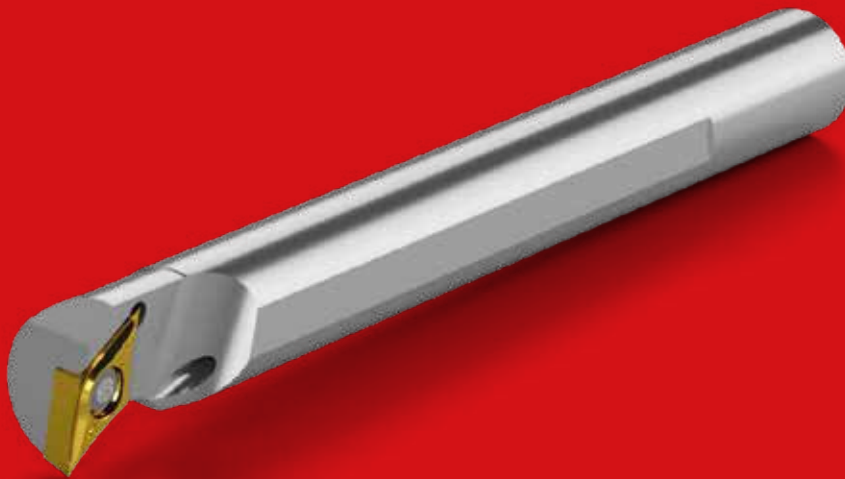
- System presentation
- ISO designation system
- Overview
- Holders with top clamping
- Holders with lever lock clamping
- Holders with screw clamping
- Torque screwdriver kit

## Lavorazione interna

- *Presentazione del sistema*
- *Sistema di identificazione ISO*
- *Panoramica*
- *Utensili con bloccaggio a staffa*
- *Utensili con bloccaggio a leva*
- *Utensili con bloccaggio a vite*
- *Set chiavi dinamometriche*

## Usinage intérieur

- Présentation du système **116 – 121**
- Système de désignation ISO **122 – 123**
- Aperçu **124 – 125**
- Support de serrage avec serrage par bride **126 – 130**
- Support de serrage avec serrage par levier à genouillère **131 – 136**
- Supports de serrage avec serrage par vis **137 – 167**
- Kit de tournevis dynamométriques **168**



# 2



# DIVERSIFIED INNER QUALITIES.

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**Whether you require large or small diameters, the ARNO system guarantees smooth processes and high quality for internal machining.**

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You can always rely on ARNO quality when it comes to internal machining. Whether you are looking for boring bars made of steel or solid carbide, with or without through tool cooling, you will always find the right tool at ARNO – the best solution for every requirement with a wide range of clamping systems and several approach angles. And for every diameter. Our ISO boring bars come in shank diameters of 4 mm to 40 mm. In combination with the matching ARNO mini indexable inserts, machining is effortless as of  $D_{\min}$  4.8 mm.



## COMPREHENSIVE BENEFITS

of the ARNO system for internal machining

Versatile – solutions for a wide range of diameters and materials

Long life – all ARNO boring bars are manufactured nickel-plated, with high tensile strength and precision

Mini dimensions – the ARNO standard portfolio makes machining possible as of  $D_{\min}$  4.8 mm.

---

## Boring bars

- Shanks with diameters of 4 mm to 40 mm
- In right-hand or left-hand design
- As of  $D_{\min} \varnothing 4.8$  mm
- With or without through tool cooling
- Steel or solid carbide boring bars
- With top clamping / lever lock clamping or screw clamping
- For indexable inserts with positive or negative shape



## Indexable inserts

- From roughing to fine finishing
- The right insert for all material types
- Variety of geometries and grades for every application
- Largest portfolio of high-positive indexable inserts in the world.

# MOLTEPLICI QUALITÀ INTERNE.

**Sia che si tratti di diametro piccolo o grande: con il sistema ARNO per la tornitura interna sono garantite produttività costante e una elevata qualità.**

---

Per la tornitura interna Lei può sempre fidarsi della qualità ARNO. Non importa se Lei cerca barenì in acciaio o in metallo duro con o senza adduzione interna del refrigerante: da ARNO Lei troverà ciò che cerca. Con i diversi utensili e i molti angoli di attacco è possibile trovare la soluzione ottimale per ogni esigenza. E anche per ogni diametro: I nostri barenì ISO vengono forniti con steli di diametro da 4 mm a 40 mm. In combinazione con gli utensili Mini di ARNO più adatti Lei sarà in grado di effettuare senza problemi lavorazioni a partire da  $D_{\min}$  4,8 mm.



## L'AMPIO SPETTRO DI VANTAGGI

del sistema ARNO per la tornitura interna

Versatili - Soluzioni per diametri e materiali diversi

A lunga durata - Tutti i barenì ARNO sono nichelati, con elevata resistenza alla trazione e sottoposti a una lavorazione di precisione

Dimensioni Mini – a partire da un  $D_{\min}$  4,8 sono possibili lavorazioni con il programma standard ARNO

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## Bareni

- Steli da  $\varnothing$  4 mm a  $\varnothing$  40 mm
- In versione destra o sinistra
- A partire da  $D_{\min}$   $\varnothing$  4,8 mm
- Disponibili con o senza adduzione interna refrigerante
- Bareni in acciaio o metallo duro
- Con bloccaggio a staffa / bloccaggio a leva o bloccaggio a vite
- Per inserti con forma positiva o negativa



## Inserti

- Dalla sgrossatura alla finitura più fine
- Il tagliente adatto per tutti i tipi di materiali
- Diverse geometrie e varietà per ogni applicazione
- La più ampia gamma di inserti altamente positivi in tutto il mondo.

# DE NOMBREUSES QUALITÉS INTÉRIEURES.

**Qu'il s'agisse de petits ou de grands diamètres : le système ARNO de tournage intérieur garantit des opérations sans failles et une grande qualité.**

Vous pouvez toujours faire confiance à la qualité ARNO pour vos opérations de tournage intérieur. Que vous cherchiez des barres d'alésage de forage en acier ou en carbure monobloc, avec ou sans refroidissement interne : chez ARNO, vous trouverez ce qu'il vous faut. Grâce aux différents supports de fixation et de serrage ainsi qu'aux nombreux angles d'attaque, il existe la solution optimale pour toutes les exigences. Et pour tous les diamètres : nous livrons nos barres d'alésage de forage ISO avec des diamètres de 4 mm à 40 mm. Combinées aux mini plaquettes de coupe amovibles d'ARNO, vous pouvez usiner sans efforts à partir d'un  $D_{\min}$  de 4,8 mm.



## LES NOMBREUX AVANTAGES

du système ARNO pour le tournage intérieur

Polyvalent – solutions pour diamètres et matériaux les plus variés

Durable – toutes les barres d'alésage de forage ARNO sont nickelées, résistantes à la traction et transformées avec précision

Dimensions mini – la gamme de produits standard ARNO permet d'usiner à partir d'un  $D_{\min}$  de 4,8 mm

## Barres d'alésage

- Corps avec  $\varnothing$  4 mm jusqu'à  $\varnothing$  40 mm
- En version droite ou gauche
- À partir d'un  $D_{\min}$   $\varnothing$  de 4,8 mm
- Avec ou sans refroidissement interne
- Barres d'alésage en acier ou en carbure monobloc
- Avec serrage par bride / serrage par levier à genouillère ou serrage par vis
- Pour plaquettes de coupe amovibles avec forme positive ou négative



## Plaquettes de coupe amovibles

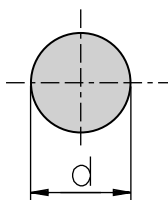

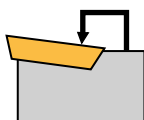
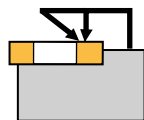
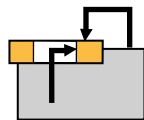
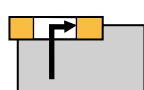
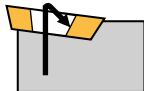
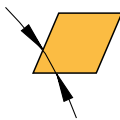
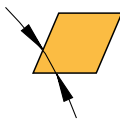
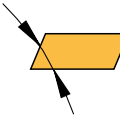








- De l'ébauche jusqu'à la finition
- La bonne plaquette pour tous les types de matériaux
- Différentes géométries et formes pour chaque application
- Plus grand choix au monde de plaquettes de coupe amovibles hautement positives

# System presentation

Presentazione del sistema


Présentation du système


## ISO DESIGNATION SYSTEM FOR TOOL HOLDERS SISTEMA DI IDENTIFICAZIONE ISO PER UTENSILI SYSTÈME DE DÉSIGNATION ISO POUR SUPPORTS DE SERRAGE

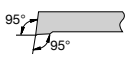
| <b>S</b>  | <b>32</b>  | <b>U</b>   | <b>P</b>  | <b>C</b>   |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
|---|--|--|---|--|----|----|----|----|----|----|----|----|--|---------------------|--|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|-----------------------|-----|---|--|--|---|
| SHANK TYPE<br>ESECUZIONE DELLO STELO<br>MODÈLE DE CORPS   | SHAFT DIAMETER<br>Ø STELO<br>Ø TIGE  | HOLDER LENGTH<br>LUNGHEZZA DELL' UTENSILE<br>LONGUEUR DU CORPS | CLAMPING METHOD<br>SISTEMA DI BLOCCAGGIO<br>SYSTÈME DE FIXATION | INSERT SHAPE<br>FORMA DI INSERTO<br>FORME DE PLAQUETTE |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <p><b>A</b><br/>Steel shank with through tool cooling<br/><i>Stelo in acciaio con foro per il raffreddamento</i><br/>Corps en acier avec alésage de refroidissement</p> <p><b>B</b><br/>Steel shank with vibration damping<br/><i>Stelo in acciaio con anti-vibrante</i><br/>Corps en acier avec effet d'amortissement des chocs</p> <p><b>C</b><br/>Carbide shank with steel head<br/><i>Stelo in metallo duro con testa in acciaio</i><br/>Corps en carbure avec tête d'acier</p> <p><b>E</b><br/>Carbide shank with steel head and through tool cooling<br/><i>Stelo in metallo duro con testa in acciaio e foro per il raffreddamento</i><br/>Corps en carbure avec tête d'acier et alésage de refroidissement</p> <p><b>S</b><br/>Steel shank<br/><i>Stelo in acciaio</i><br/>Corps en acier</p> |  <table border="1" style="margin-top: 10px;"> <thead> <tr style="background-color: #cccccc;"> <th>d [mm]</th> </tr> </thead> <tbody> <tr><td>08</td></tr> <tr><td>10</td></tr> <tr><td>12</td></tr> <tr><td>16</td></tr> <tr><td>20</td></tr> <tr><td>25</td></tr> <tr><td>32</td></tr> <tr><td>40</td></tr> <tr><td>50</td></tr> <tr><td>60</td></tr> </tbody> </table> | d [mm]   | 08  | 10   | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 60 |  <table border="1" style="margin-top: 10px;"> <thead> <tr style="background-color: #cccccc;"> <th colspan="2">l<sub>1</sub> [mm]</th> </tr> </thead> <tbody> <tr><td><b>A</b></td><td>32</td></tr> <tr><td><b>B</b></td><td>40</td></tr> <tr><td><b>C</b></td><td>50</td></tr> <tr><td><b>D</b></td><td>60</td></tr> <tr><td><b>E</b></td><td>70</td></tr> <tr><td><b>F</b></td><td>80</td></tr> <tr><td><b>G</b></td><td>90</td></tr> <tr><td><b>H</b></td><td>100</td></tr> <tr><td><b>J</b></td><td>110</td></tr> <tr><td><b>K</b></td><td>125</td></tr> <tr><td><b>L</b></td><td>140</td></tr> <tr><td><b>M</b></td><td>150</td></tr> <tr><td><b>N</b></td><td>160</td></tr> <tr><td><b>P</b></td><td>170</td></tr> <tr><td><b>Q</b></td><td>180</td></tr> <tr><td><b>R</b></td><td>200</td></tr> <tr><td><b>S</b></td><td>250</td></tr> <tr><td><b>T</b></td><td>300</td></tr> <tr><td><b>U</b></td><td>350</td></tr> <tr><td><b>V</b></td><td>400</td></tr> <tr><td><b>W</b></td><td>450</td></tr> <tr><td><b>Y</b></td><td>500</td></tr> <tr><td><b>Special length</b></td><td>→ X</td></tr> <tr><td colspan="2"><i>Lunghezza speciale</i><br/><i>Longueur spéciale</i></td></tr> </tbody> </table> | l <sub>1</sub> [mm] |  | <b>A</b> | 32 | <b>B</b> | 40 | <b>C</b> | 50 | <b>D</b> | 60 | <b>E</b> | 70 | <b>F</b> | 80 | <b>G</b> | 90 | <b>H</b> | 100 | <b>J</b> | 110 | <b>K</b> | 125 | <b>L</b> | 140 | <b>M</b> | 150 | <b>N</b> | 160 | <b>P</b> | 170 | <b>Q</b> | 180 | <b>R</b> | 200 | <b>S</b> | 250 | <b>T</b> | 300 | <b>U</b> | 350 | <b>V</b> | 400 | <b>W</b> | 450 | <b>Y</b> | 500 | <b>Special length</b> | → X | <i>Lunghezza speciale</i><br><i>Longueur spéciale</i> |  |  <p><b>C</b><br/>Top clamping<br/><i>Bloccaggio da sopra</i><br/><i>Bridage supérieur</i></p>  <p><b>D</b><br/>Top and hole clamping<br/><i>Bloccaggio combinato da sopra</i><br/><i>Bridage supérieur et par le trou</i></p>  <p><b>M</b><br/>Top and hole clamping<br/><i>Bloccaggio combinato da sopra</i><br/><i>Bridage supérieur et par le trou</i></p>  <p><b>P</b><br/>Lever lock clamping<br/><i>Bloccaggio a leva</i><br/><i>Levier a genouillère</i></p>  <p><b>S</b><br/>Screw clamping<br/><i>Bloccaggio a vite</i><br/><i>Serrage par vis</i></p> |  <p>80° <b>C</b></p>  <p>55° <b>D</b></p> <p>75° <b>E</b></p> <p>86° <b>M</b></p> <p>35° <b>V</b></p>  <p>85° <b>A</b></p> <p>82° <b>B</b></p> <p>55° <b>K</b></p>  <p><b>H</b></p>  <p><b>L</b></p>  <p><b>O</b></p>  <p><b>P</b></p>  <p><b>R</b></p>  <p><b>S</b></p>  <p><b>T</b></p>  <p><b>W</b></p> |
| d [mm]  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 08  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 10  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 12  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 16  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 20  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 25  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 32  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 40  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 50  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| 60  |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| l <sub>1</sub> [mm]   |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>A</b>  | 32   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>B</b>  | 40   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>C</b>  | 50   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>D</b>  | 60   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>E</b>  | 70   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>F</b>  | 80   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>G</b>  | 90   |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>H</b>  | 100  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>J</b>  | 110  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>K</b>  | 125  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>L</b>  | 140  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>M</b>  | 150  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>N</b>  | 160  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>P</b>  | 170  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>Q</b>  | 180  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>R</b>  | 200  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>S</b>  | 250  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>T</b>  | 300  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>U</b>  | 350  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>V</b>  | 400  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>W</b>  | 450  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>Y</b>  | 500  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <b>Special length</b>   | → X  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |
| <i>Lunghezza speciale</i><br><i>Longueur spéciale</i>   |  |  |   |  |    |    |    |    |    |    |    |    |  |                     |  |          |    |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |                       |     |   |  |  |   |

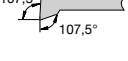
### L


**APPROACH ANGLE**  
FORMA  
HAUTEUR DE TIGE


90°  **F**


75°  **K**


95°  **L**

107,5°  **Q**

45°  **S**

93°  **U**

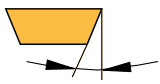
60°  **W**

85°  **Y**

**Special style → X**  
Forma speciale  
Forme spéciale

### N

**CLEARANCE ANGLE**  
SPOGLIA  
LARGUEUR DE TIGE



3° **A**

5° **B**

7° **C**

15° **D**

20° **E**

25° **F**

30° **G**

0° **N**

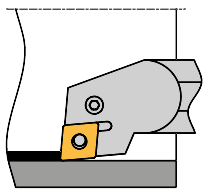
11° **P**

**Others → O**  
Altri  
Autres

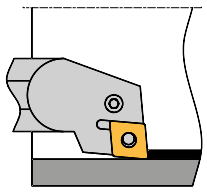
### L

**HOLDER DESIGN**  
VERSIONE  
LONGUEUR DU CORPS

**R**



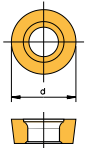
**L**




### 12

**EDGE LENGTH**  
LUNGHEZZA DEL  
TAGLIANTE  
LONGUEUR D'ARÊTE DE  
COUPE

d  
[mm]



06  
08  
10  
12  
16  
20  
25  
32



| d    |        |        |      |
|------|--------|--------|------|
| [mm] | [inch] | [mm]   | [mm] |
| 06   | 5/32   | 3,97   | 03   |
| 08   | 3/16   | 4,76   | 04   |
| 09   | 7/32   | 5,56   | 05   |
| 11   | 1/4    | 6,35   | 06   |
| 16   | 3/8    | 9,525  | 09   |
| 22   | 1/2    | 12,7   | 12   |
| 27   | 5/8    | 15,875 | 15   |
| 33   | 3/4    | 19,05  | 19   |
| 44   | 1      | 25,4   | 25   |

### ...

**ADDITIONAL CODING**  
INFORMAZIONI  
SUPPLEMENTARI  
INFORMATION  
COMPLÉMENTAIRE

**Special product features are indicated by an internal company code at digit 10.**

*Per particolari caratteristiche del prodotto in questa posizione può essere inserito un codice interno del produttore.*

Pour les caractéristiques spécifiques de produit, un code interne à l'entreprise peut être indiqué au 10e emplacement.



# TOP CLAMPING / LEVER LOCK CLAMPING

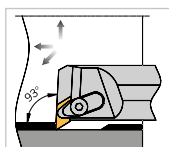
## BLOCCAGGIO DA SOPRA / BLOCCAGGIO A LEVA

### SERRAGE PAR BRIDE / SERRAGE PAR LEVIER À GENOUILLÈRE

**Top clamping – positive**

*Bloccaggio a staffa – positivo*

Serrage par bride – positif



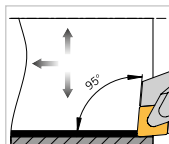
**ACKUC**  
L/R

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**Top clamping – negative**

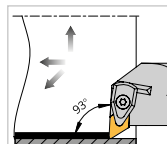
*Bloccaggio a staffa – negativo*

Serrage par bride – négatif



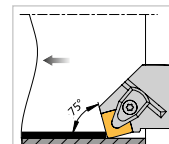
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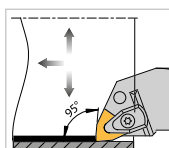
**DDUN**  
L/R

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**DSKN**  
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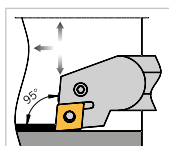
**DWLN**  
L/R

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**Lever lock clamping – negative**

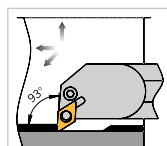
*Bloccaggio a leva – negativo*

Serrage par levier à genouillère – négatif



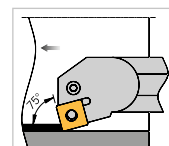
**PCLN**  
L/R

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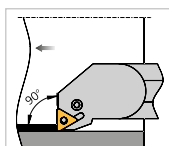
**PDUN**  
L/R

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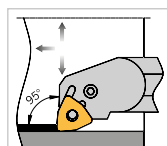
**PSKN**  
L/R

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**PTFN**  
L/R

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**PWLN**  
L/R

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**Torque Screwdriver Sets**

*Set chiavi dinamometriche*

Kit de tournevis dynamométriques



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# SCREW CLAMPING

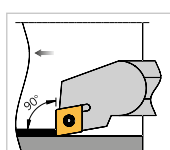
## BLOCCAGGIO A VITE

### SERRAGE PAR VIS

#### Screw clamping – positive

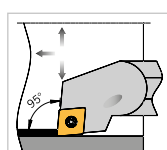
*Bloccaggio a vite – positivo*

Serrage par vis – positif



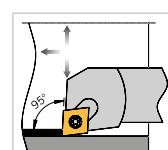
**SCFC**  
L/R

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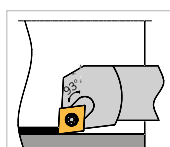
**SCLC**  
L/R

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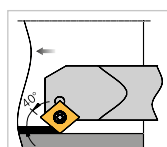
**SCLD**  
L/R

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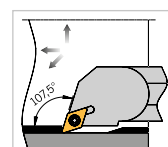
**SCUP**  
L/R

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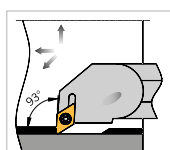
**SCXP**  
L/R

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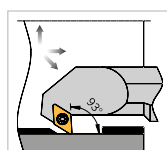
**SDQC**  
L/R

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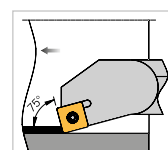
**SDUC**  
L/R

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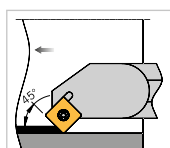
**SDXC**  
L/R

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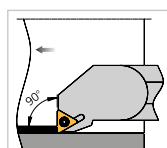
**SSKC**  
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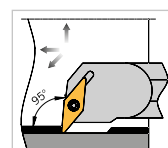
**SSSC**  
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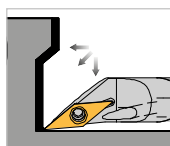
**STFC**  
L/R

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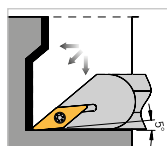
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L/R

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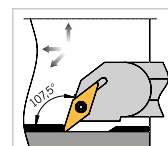
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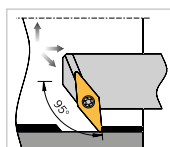
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L/R

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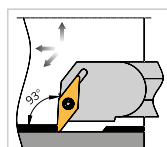
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L/R

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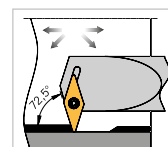
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L/R

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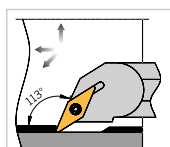
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L/R

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Page 160



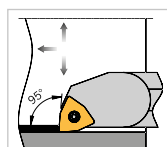
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L/R

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Pagina  
Page 162



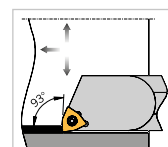
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L/R

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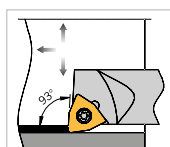
**SWLC**  
L/R

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**SWUC**  
L/R

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Pagina  
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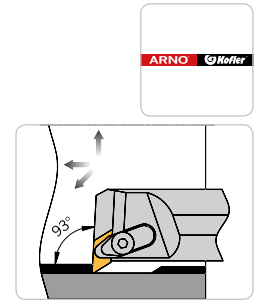
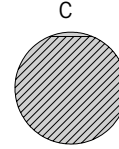
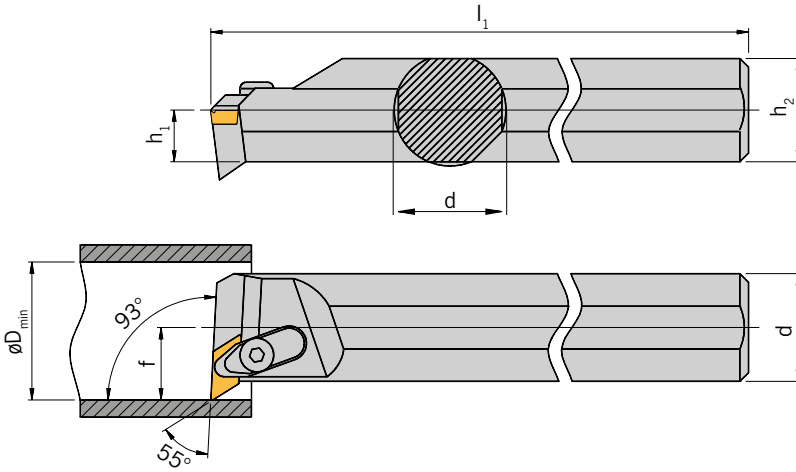


**SWC**  
L/R

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**ACKUC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|------------------------------|
| S12Q ACKUCL/R 11                   | 12 | 6,0            | 11,5           | 180            | 9  | 17               | KCGX 1103...                 |
| S16R ACKUCL/R 11                   | 16 | 7,5            | 15,0           | 200            | 11 | 20               | KCGX 1103...                 |
| S20S ACKUCR 11                     | 20 | 9,5            | 19,0           | 250            | 13 | 25               | KCGX 1103...                 |
| S25T ACKUCL/R 11                   | 25 | 12,0           | 24,0           | 300            | 17 | 32               | KCGX 1103...                 |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank / Barenì - Con stelo in metallo duro / Barres d'alésage - Avec corps en carbure monobloc

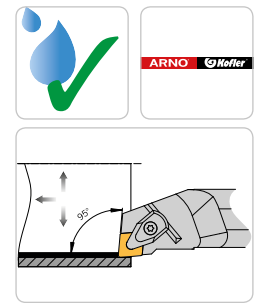
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|------------------------------|
| C12Q ACKUCR 11                     | 12 | 6,0            | 11,5           | 180            | 9  | 17               | KCGX 1103...                 |
| C16R ACKUCR 11                     | 16 | 8,0            | 15,5           | 200            | 11 | 20               | KCGX 1103...                 |
| C20S ACKUCL 11                     | 20 | 10,0           | 19,5           | 250            | 13 | 25               | KCGX 1103...                 |
| C25T ACKUCL/R 11                   | 25 | 12,5           | 24,0           | 300            | 17 | 32               | KCGX 1103...                 |

**Spare Parts / Ricambi / Pièces de rechange**

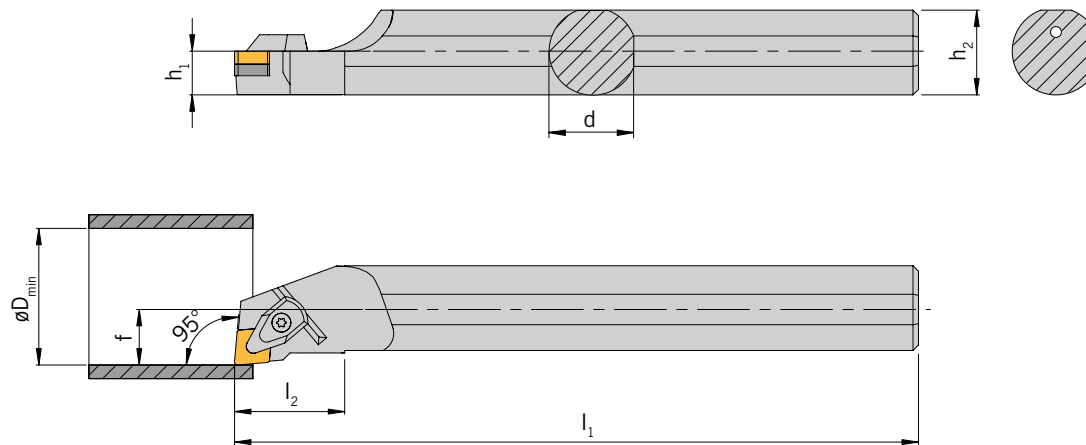
| Holder<br>Utensile<br>Porte-Outil | Clamp<br>Staffa<br>Support | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------------|----------------------|---|---|----------------------|
| .. 12-20.. ACKUC L/R 11           | KL11                       | S11                  | -                                       | -   | KS 2520              |
| .. 25.. ACKUC L/R 11              | KL11                       | KL11                 | UPL11R                                  | UPS   | KS 2520              |

**DCLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

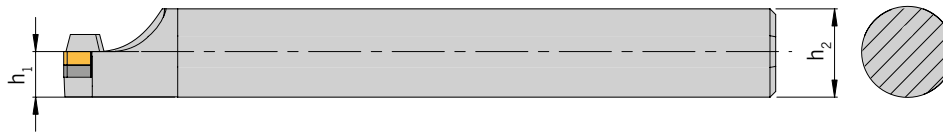
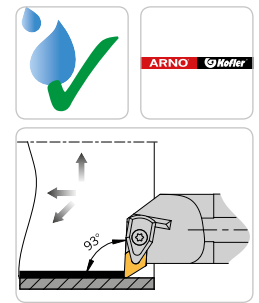
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| A32S DCLNL/R 12-A                  | 32 | 31             | 250            | 40             | 22 | 40               | CN.. 1204...               |
| A40T DCLNL/R 12-A                  | 40 | 39             | 300            | 45             | 27 | 50               | CN.. 1204...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support | Coolant jet<br>Ugello refrigerante<br>Buse d'arrosage |
|-----------------------------------|--|---|---|---|
| A.. DCLN.. 12-A                   | KD2201   | U-CN12T3-D                              | M4,5X10-T15   | SPD 1111  |

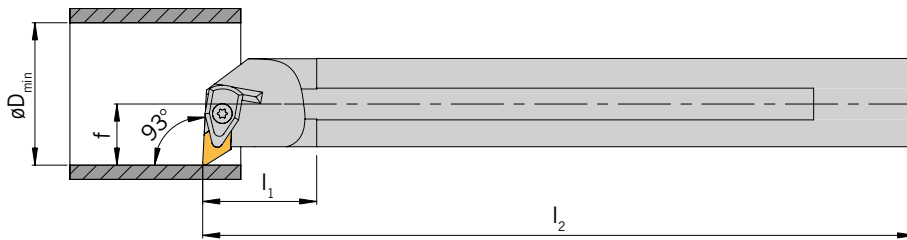
**DDUN L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

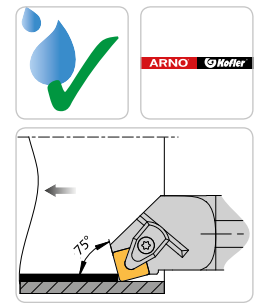
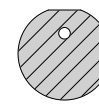
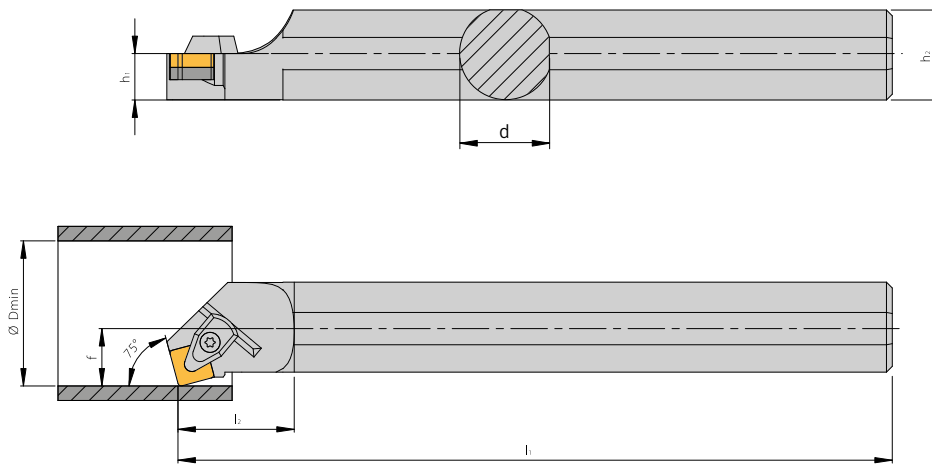
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| A32S DDUNL/R 11-A                  | 32 | 31             | 250            | 40             | 22 | 40               | DN.. 1104...               |
| A40T DDUNL/R 15-A                  | 40 | 39             | 300            | 45             | 27 | 50               | DN.. 1506...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support |
|-----------------------------------|--|---|---|
| A32S DDUN L/R 11-A                | KD1105   | U-DN1103-D                              | M3,0X7-T09  |
| A40T DDUN L/R 15-A                | KD2201   | U-DN15T3-D                              | M4,5X10-T15   |

**DSKN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

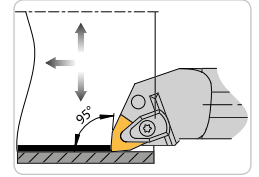
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| A32S DSKNL/R 12-A                  | 32 | 31             | 250            | 40             | 22 | 40               | SN.. 1204...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support |
|-----------------------------------|--|---|---|
| A32S DSKN L/R 12-A                | KD2201   | U-SN12T3-D                              | M4,5X10-T15   |

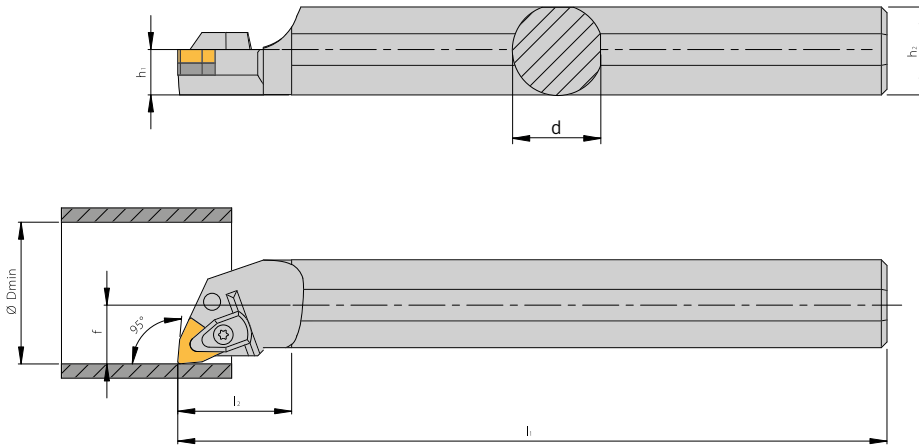
**DWLNL/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With top clamping / Con bloccaggio a staffa / Avec serrage par bride



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

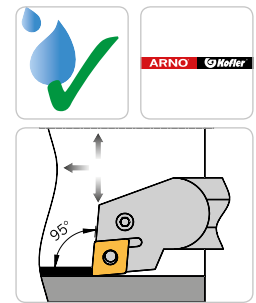
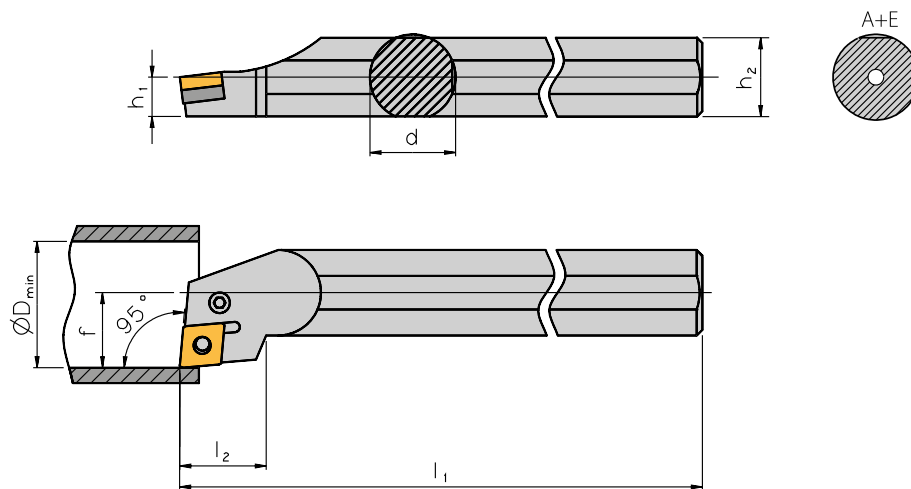
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|-----------------------------|
| A25R DWLNL/R 06-A                  | 25 | 24             | 200            | 32             | 17 | 32               | WN.. 0604...                |
| A32S DWLNL/R 08-A                  | 32 | 31             | 250            | 40             | 22 | 40               | WN.. 0804...                |
| A40T DWLNL/R 08-A                  | 40 | 39             | 300            | 45             | 27 | 50               | WN.. 0804...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support | Coolant jet<br>Ugello refrigerante<br>Buse d'arrosage |
|-----------------------------------|--|---|---|---|
| A.. DWLN.. 06-A                   | KD1105   | U-WN0603-D                              | M3,0X7-T09  | SPD 1111  |
| A.. DWLN.. 08-A                   | KD2201   | U-WN08T3-D                              | M4,5X10-T15   | SPD 1111  |

**PCLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| S16R PCLNL/R 09                    | 16 | 7,5            | 16             | 200            | 21,0           | 11 | 20               | CN.. 0903...                |
| S20S PCLNL/R 09                    | 20 | 9,0            | 18             | 250            | 21,0           | 13 | 25               | CN.. 0903...                |
| S25T PCLNL/R 09                    | 25 | 11,5           | 23             | 300            | 21,0           | 17 | 32               | CN.. 0903...                |
| S25T PCLNL/R 12                    | 25 | 11,5           | 23             | 300            | 22,0           | 17 | 32               | CN.. 1204...                |
| S32U PCLNL/R 12                    | 32 | 15,0           | 30             | 350            | 24,1           | 22 | 40               | CN.. 1204...                |
| S40V PCLNL/R 12                    | 40 | 18,5           | 37             | 400            | 24,1           | 27 | 49               | CN.. 1204...                |
| S50W PCLNL/R 16                    | 50 | 23,5           | 47             | 450            | 31,0           | 35 | 62               | CN.. 1606...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| A16M PCLNL/R 09                    | 16 | 8,0            | 15,5           | 150            | 21,0           | 11 | 20               | CN.. 0903...                |
| A20Q PCLNL/R 09                    | 20 | 10,0           | 19,0           | 180            | 21,0           | 13 | 25               | CN.. 0903...                |
| A25R PCLNL/R 09                    | 25 | 12,5           | 24,0           | 200            | 21,0           | 17 | 32               | CN.. 0903...                |
| A25R PCLNL/R 12                    | 25 | 12,5           | 24,0           | 200            | 21,0           | 17 | 32               | CN.. 1204...                |
| A32S PCLNL/R 12                    | 32 | 16,0           | 31,0           | 250            | 24,1           | 22 | 40               | CN.. 1204...                |
| A40T PCLNL/R 12                    | 40 | 20,0           | 38,5           | 300            | 24,1           | 27 | 49               | CN.. 1204...                |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| E32U PCLNL/R 12                    | 32 | 16             | 31             | 350            | 24,1           | 22 | 40               | CN.. 1204...                |

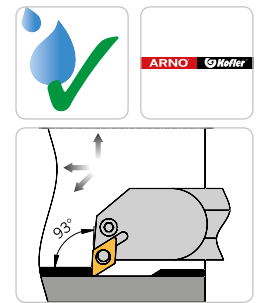


## Spare Parts / Ricambi / Pièces de rechange

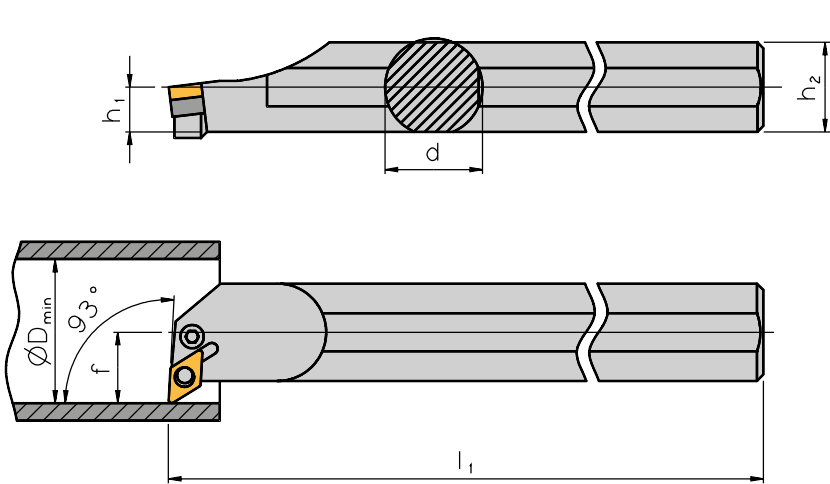
| Holder<br><i>Utensile</i><br>Porte-Outil | 1 Support pad<br><i>1 Supporto</i><br>1 Cale-support | 2 Lever<br><i>2 Leva</i><br>2 Levier | 3 Clamping screw<br><i>3 Vite di bloccaggio</i><br>3 Vis de blocage | 4 Hollow pin<br><i>4 Spina elastica</i><br>4 Goupille tubulaire | Assembly pin<br><i>Spina di montaggio</i><br>Broche de montage | Key<br><i>Chiave</i><br>Clé | Spare part set 1-4<br><i>Set ricambi 1-4</i><br>Gamme 1-4 |
|--|--|--------------------------------------|---|---|--|-----------------------------|---|
| .. 16.. PCLN L/R 09                      | -  | HP 1118                              | SP 1118   | -   | -  | KP 3421                     | P 1113  |
| .. 20.. PCLN L/R 09                      | -  | HP 1118                              | SP 1118   | -   | -  | KP 3421                     | P 1113  |
| .. 25.. PCLN L/R 09                      | UP 1115  | HP 4751                              | SP 3111   | RP 3112   | MP 3111  | KP 3111                     | P 1112  |
| .. 25.. PCLN L/R 12                      | UP 1111  | HP 1111                              | SP 1114   | RP 1111   | MP 1111  | KP 1111                     | P 1114  |
| .. 32.. PCLN L/R 12                      | UP 1111  | HP 1111                              | SP 1111   | RP 1111   | MP 1111  | KP 1111                     | P 1111  |
| .. 40.. PCLN L/R 12                      | UP 1111  | HP 1111                              | SP 1111   | RP 1111   | MP 1111  | KP 1111                     | P 1111  |
| .. 50.. PCLN L/R 16                      | UP 1221  | HP 1221                              | SP 1221   | RP 1221   | MP 1221  | KP 1111                     | P 1221  |

**PDUN L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

Holders / Utensili / Porte-outils

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f    | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|------|------------------|----------------------------|
| S20S PDUNL/R 11                    | 20 | 9,0            | 18             | 250            | 16,0 | 27               | DN.. 1104...               |
| S25T PDUNL/R 11                    | 25 | 11,5           | 23             | 300            | 18,5 | 32               | DN.. 1104...               |
| S32U PDUNL/R 11                    | 32 | 15,0           | 30             | 350            | 22,0 | 40               | DN.. 1104...               |
| S32U PDUNL/R 15                    | 32 | 15,0           | 30             | 350            | 22,0 | 40               | DN.. 1506...               |
| S40V PDUNL/R 15                    | 40 | 18,5           | 37             | 400            | 27,0 | 49               | DN.. 1506...               |
| S50W PDUNL/R 15                    | 50 | 23,5           | 47             | 450            | 35,0 | 62               | DN.. 1506...               |

Holders / Utensili / Porte-outils

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f    | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|------|------------------|----------------------------|
| A20Q PDUNL/R 11                    | 20 | 10,0           | 19,0           | 180            | 16,0 | 27               | DN.. 1104...               |
| A25R PDUNL/R 11                    | 25 | 12,5           | 24,0           | 200            | 18,5 | 32               | DN.. 1104...               |
| A32S PDUNL/R 11                    | 32 | 16,0           | 31,0           | 250            | 22,0 | 40               | DN.. 1104...               |
| A32S PDUNL/R 15                    | 32 | 16,0           | 31,0           | 250            | 22,0 | 40               | DN.. 1506...               |
| A40T PDUNL/R 15                    | 40 | 20,0           | 38,5           | 300            | 27,0 | 49               | DN.. 1506...               |

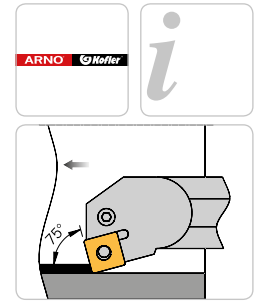
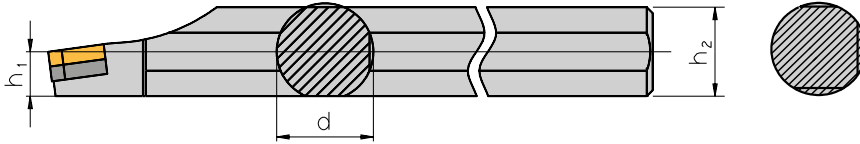
**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA - A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

Spare Parts / Ricambi / Pièces de rechange

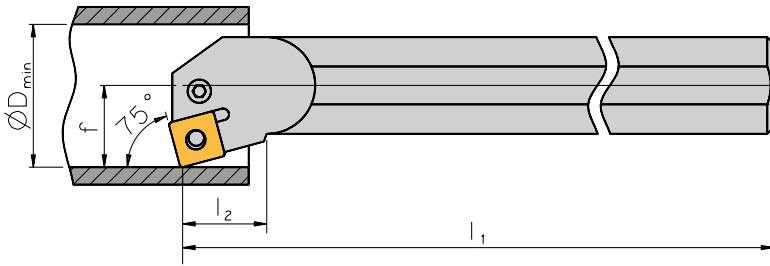
| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| .. 20.. PDUN L/R 11               | -   | HP 2012                       | SP 3112  | -  | -   | KP 3111              | P 2012   |
| .. 25.. PDUN L/R 11               | UP 2011                                       | HP 2011                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 2011   |
| .. 32.. PDUN L/R 11               | UP 2011                                       | HP 2011                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 2011   |
| .. 40.. PDUN L/R 15               | UP 2421                                       | HP 2421                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 2421   |
| .. 50.. PDUN L/R 15               | UP 2421                                       | HP 2421                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 2421   |

**PSKN L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

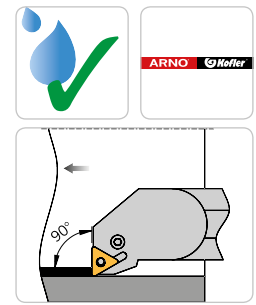
| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|------------------------------|
| S25T PSKNL/R 12                    | 25 | 11,5           | 23             | 300            | 15,5           | 17 | 32               | SN.. 1204...                 |
| S32U PSKNL/R 12                    | 32 | 15,0           | 30             | 350            | 16,0           | 22 | 40               | SN.. 1204...                 |
| S40V PSKNL/R 12                    | 40 | 18,5           | 37             | 400            | 23,0           | 27 | 49               | SN.. 1204...                 |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| .. 25.. PSKN L/R 12               | UP 5112                                       | HP 1111                       | SP 1114  | RP 1111  | MP 1111   | KP 1111              | P 1115   |
| .. 32.. PSKN L/R 12               | UP 5112                                       | HP 1111                       | SP 1114  | RP 1111  | MP 1111   | KP 1111              | P 1115   |
| .. 40.. PSKN L/R 12               | UP 5112                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 5112   |

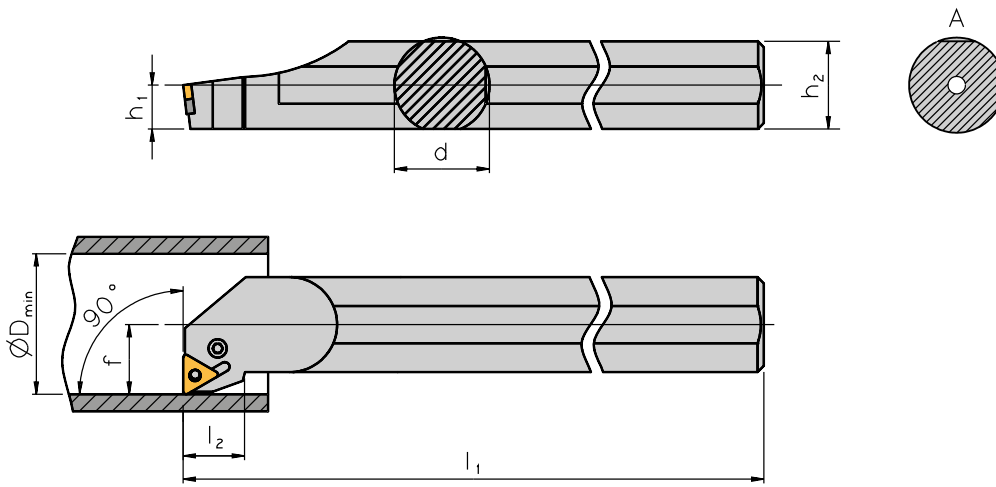
**PTFN L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| S16R PTFNL/R 11                    | 16 | 7,5            | 15             | 200            | 14,0           | 11 | 20               | TN.. 1103...                |
| S20S PTFNL/R 11                    | 20 | 9,0            | 18             | 250            | 14,0           | 13 | 25               | TN.. 1103...                |
| S25T PTFNL/R 16                    | 25 | 11,5           | 23             | 300            | 17,5           | 17 | 32               | TN.. 1604...                |
| S32U PTFNL/R 16                    | 32 | 15,0           | 30             | 350            | 18,0           | 22 | 40               | TN.. 1604...                |
| S40V PTFNL/R 22                    | 40 | 18,5           | 37             | 400            | 27,0           | 27 | 49               | TN.. 2204...                |
| S50W PTFNR 22                      | 50 | 23,5           | 47             | 450            | 35,0           | 35 | 62               | TN.. 2204...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| A16M PTFNL 11                      | 16 | 8,0            | 15,5           | 150            | 14,0           | 11 | 20               | TN.. 1103...                |
| A20Q PTFNR 11                      | 20 | 10,0           | 19,0           | 180            | 14,0           | 13 | 25               | TN.. 1103...                |
| A25R PTFNL/R 16                    | 25 | 12,5           | 24,0           | 200            | 17,5           | 17 | 32               | TN.. 1604...                |
| A32S PTFNL/R 16                    | 32 | 16,0           | 31,0           | 250            | 18,0           | 22 | 40               | TN.. 1604...                |

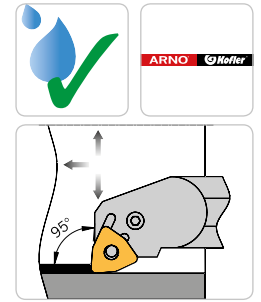
**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA - A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

**Spare Parts / Ricambi / Pièces de rechange**

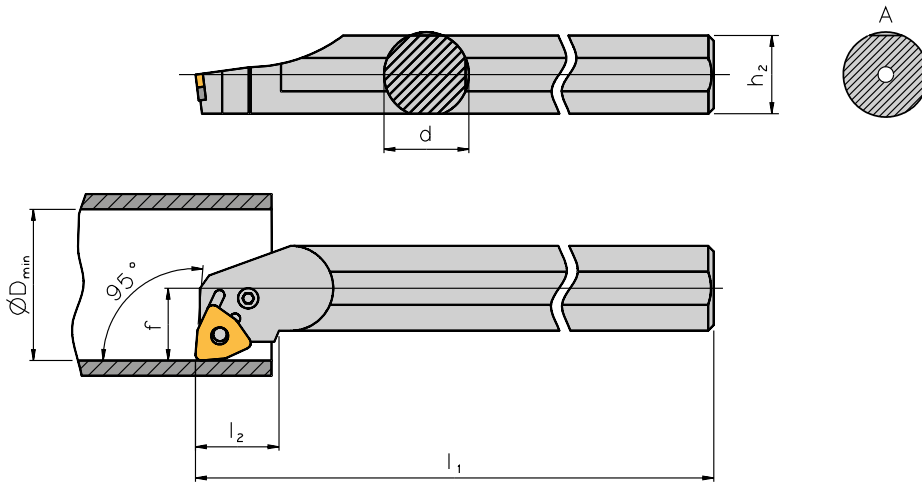
| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| .. 16.. PTFN L/R 11               | -   | HP 6051                       | SP 5751  | -  | -   | KP 3421              | P 6051   |
| .. 20.. PTFN L/R 11               | -   | HP 6051                       | SP 5751  | -  | -   | KP 3421              | P 6051   |
| .. 25.. PTFN L/R 16               | UP 6211                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 6211   |
| .. 32.. PTFN L/R 16               | UP 6211                                       | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 6211   |
| .. 40.. PTFN L/R 22               | UP 6811                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 6811   |
| .. 50.. PTFN L/R 22               | UP 6811                                       | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 6811   |

**PWLN L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With lever lock clamping / Con bloccaggio a leva / Avec serrage par levier



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| S20S PWLN/L/R 06                   | 20 | 18             | 250            | 19,5           | 13 | 25               | WN.. 0604...               |
| S25T PWLN/L/R 06                   | 25 | 23             | 300            | 19,5           | 17 | 32               | WN.. 0604...               |
| S32U PWLN/L/R 06                   | 32 | 30             | 350            | 19,5           | 22 | 40               | WN.. 0604...               |
| S32U PWLN/L/R 08                   | 32 | 30             | 350            | 26,0           | 22 | 40               | WN.. 0804...               |
| S40V PWLN/L/R 08                   | 40 | 37             | 400            | 26,0           | 27 | 49               | WN.. 0804...               |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| A16M PWLN/L/R 06                   | 16 | 15,5           | 150            | 17,5           | 11 | 21               | WN.. 0604...               |
| A20Q PWLN/L/R 06                   | 20 | 19,0           | 180            | 19,5           | 13 | 25               | WN.. 0604...               |
| A25R PWLN/L/R 06                   | 25 | 24,0           | 200            | 19,5           | 17 | 32               | WN.. 0604...               |
| A32S PWLN/L/R 06                   | 32 | 31,0           | 250            | 19,5           | 22 | 40               | WN.. 0604...               |
| A32S PWLN/L/R 08                   | 32 | 31,0           | 250            | 26,0           | 22 | 40               | WN.. 0804...               |
| A40T PWLN/L/R 08                   | 40 | 39,0           | 300            | 26,0           | 27 | 49               | WN.. 0804...               |

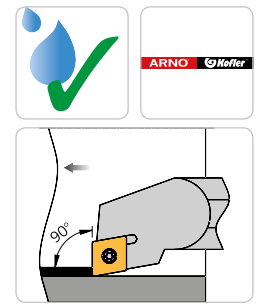
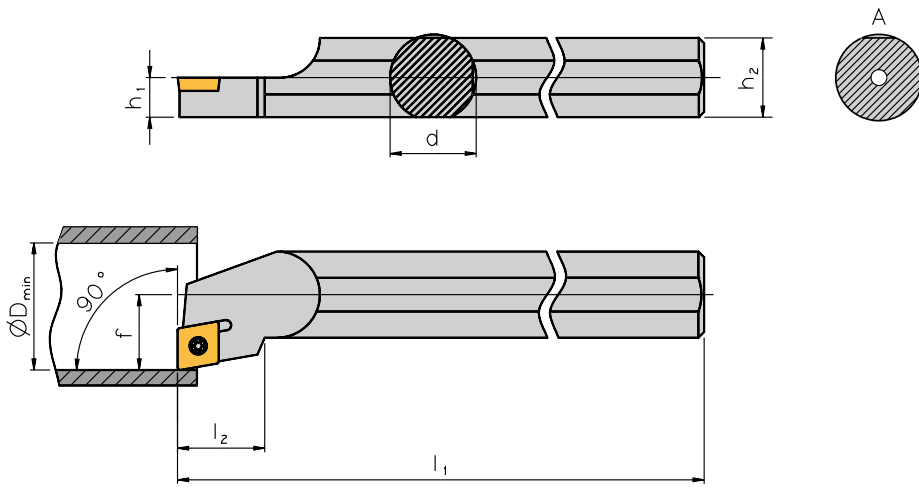
**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | 1 Support pad<br>1 Supporto<br>1 Cale-support | 2 Lever<br>2 Leva<br>2 Levier | 3 Clamping screw<br>3 Vite di bloccaggio<br>3 Vis de blocage | 4 Hollow pin<br>4 Spina elastica<br>4 Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé | Spare part set 1-4<br>Set ricambi 1-4<br>Gamme 1-4 |
|-----------------------------------|---|-------------------------------|--|--|---|----------------------|--|
| .. 16.. PWLN L/R 06               | -   | HP 4753                       | SP 3113  | -  | -   | KP 3421              | P 71111  |
| .. 20.. PWLN L/R 06               | -   | HP 4753                       | SP 3113  | -  | -   | KP 3421              | P 71111  |
| .. 25.. PWLN L/R 06               | UP 71111                                      | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 71112  |
| .. 32.. PWLN L/R 06               | UP 71111                                      | HP 4751                       | SP 3111  | RP 3112  | MP 3111   | KP 3111              | P 71112  |
| .. 32.. PWLN L/R 08               | UP 71011                                      | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 71011  |
| .. 40.. PWLN L/R 08               | UP 71011                                      | HP 1111                       | SP 1111  | RP 1111  | MP 1111   | KP 1111              | P 71011  |

SCFC L/R

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

Holders / Utensili / Porte-outils

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|---|------------------|-----------------------------|
| S08H SCFCL/R 06                    | 8  | 3,5            | 7              | 100            | -              | 5 | 11               | CC.. 0602...                |
| S10K SCFCL/R 06                    | 10 | 4,5            | 9              | 125            | 9              | 7 | 14               | CC.. 0602...                |
| S12Q SCFCL/R 06                    | 12 | 5,5            | 11             | 180            | 14             | 9 | 17               | CC.. 0602...                |

Holders / Utensili / Porte-outils

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|---|------------------|-----------------------------|
| A08F SCFCL/R 06                    | 8  | 4              | 7,5            | 80             | -              | 5 | 11               | CC.. 0602...                |
| A10H SCFCL/R 06                    | 10 | 5              | 9,5            | 100            | 9              | 7 | 14               | CC.. 0602...                |
| A12K SCFCL/R 06                    | 12 | 6              | 11,5           | 125            | 14             | 9 | 17               | CC.. 0602...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

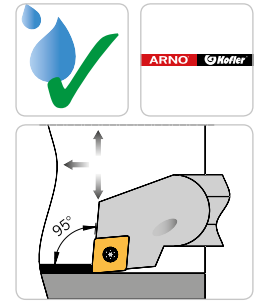
Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| .. 08.. SCFC L/R 06               | SS 1754              | KS 1751              | S 1754                                 |
| .. 10.. SCFC L/R 06               | SS 1754              | KS 1751              | S 1754                                 |
| .. 12.. SCFC L/R 06               | SS 1754              | KS 1751              | S 1754                                 |

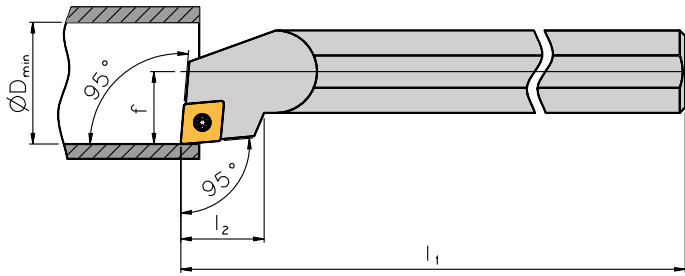
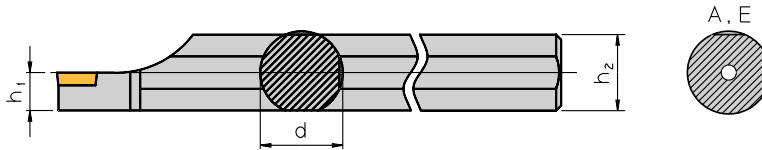
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver  
Set ricambi include: 3 Viti Torx, 1 Chiave Torx  
L'assortiment comprend : 3 vis, 1 clé

**SCLC L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|----------------------------|
| S08H SCLCL/R 06                    | 8  | 3,5            | 7              | 100            | -              | 5  | 11,0             | CC.. 0602...               |
| S10K SCLCL/R 06                    | 10 | 4,5            | 9              | 125            | 10             | 7  | 13,0             | CC.. 0602...               |
| S12Q SCLCL/R 06                    | 12 | 5,5            | 11             | 180            | 10             | 9  | 16,0             | CC.. 0602...               |
| S16R SCLCL/R 09                    | 16 | 7,5            | 15             | 200            | 16             | 11 | 20,0             | CC.. 09T1...               |
| S20S SCLCL/R 09                    | 20 | 9,0            | 18             | 250            | 16             | 13 | 25,0             | CC.. 09T1...               |
| S25T SCLCL/R 09                    | 25 | 11,5           | 23             | 300            | 16             | 17 | 31,5             | CC.. 09T1...               |
| S32U SCLCL/R 12                    | 32 | 15,0           | 30             | 350            | 22             | 22 | 40,0             | CC.. 1204...               |
| S40V SCLCL/R 12                    | 40 | 18,5           | 37             | 400            | 22             | 27 | 49,0             | CC.. 1204...               |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|----------------------------|
| A08F SCLCL/R 06                    | 8  | 4,0            | 7,5            | 80             | -              | 5  | 11,0             | CC.. 0602...               |
| A10H SCLCL/R 06                    | 10 | 5,0            | 9,5            | 100            | 10             | 7  | 13,0             | CC.. 0602...               |
| A12K SCLCL/R 06                    | 12 | 6,0            | 11,5           | 125            | 10             | 9  | 16,0             | CC.. 0602...               |
| A16M SCLCL/R 09                    | 16 | 8,0            | 15,5           | 150            | 16             | 11 | 20,0             | CC.. 09T1...               |
| A20Q SCLCL/R 09                    | 20 | 10,0           | 19,0           | 180            | 16             | 13 | 25,0             | CC.. 09T1...               |
| A25R SCLCL/R 09                    | 25 | 12,5           | 24,0           | 200            | 16             | 17 | 31,5             | CC.. 09T1...               |
| A32S SCLCL/R 12                    | 32 | 16,0           | 31,0           | 250            | 22             | 22 | 40,0             | CC.. 1204...               |
| A40T SCLCL/R 12                    | 40 | 20,0           | 38,5           | 300            | 22             | 27 | 49,0             | CC.. 1204...               |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

## Holders / Utensili / Porte-outils

**Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|----------------------------|
| <b>E08H SCLCL/R 06</b>             | 8  | 4,0            | 7,5            | 100            | -              | 5  | 11,0             | CC.. 0602...               |
| <b>E10K SCLCL/R 06</b>             | 10 | 5,0            | 9,5            | 125            | 10             | 7  | 14,0             | CC.. 0602...               |
| <b>E12Q SCLCL/R 06</b>             | 12 | 6,0            | 11,5           | 180            | 10             | 9  | 17,0             | CC.. 0602...               |
| <b>E16R SCLCL/R 09</b>             | 16 | 8,0            | 15,5           | 200            | 16             | 11 | 21,0             | CC.. 09T3...               |
| <b>E20S SCLCL/R 09</b>             | 20 | 10,0           | 19,0           | 250            | 16             | 13 | 25,0             | CC.. 09T3...               |
| <b>E25T SCLCL/R 09</b>             | 25 | 12,5           | 24,0           | 300            | 16             | 17 | 31,5             | CC.. 09T3...               |
| <b>E32U SCLCL/R 12</b>             | 32 | 16,0           | 31,0           | 350            | 22             | 22 | 40,0             | CC.. 1204...               |

2

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| <b>.. 08.. SCLC L/R 06</b>        | -                          | SS 1754              | -                                       | KS 1751              | S 1754                                 |
| <b>.. 10.. SCLC L/R 06</b>        | -                          | SS 1754              | -                                       | KS 1751              | S 1754                                 |
| <b>.. 12.. SCLC L/R 06</b>        | -                          | SS 1754              | -                                       | KS 1751              | S 1754                                 |
| <b>.. 16.. SCLC L/R 09</b>        | -                          | SS 1114              | -                                       | KS 1111              | S 2314                                 |
| <b>.. 20.. SCLC L/R 09</b>        | -                          | SS 1114              | -                                       | KS 1111              | S 2314                                 |
| <b>.. 25.. SCLC L/R 09</b>        | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| <b>.. 32.. SCLC L/R 12</b>        | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |
| <b>.. 40.. SCLC L/R 12</b>        | GBS 1221                   | SS 1221              | US 1221                                 | KS 1115              | S 1221                                 |

**Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.**

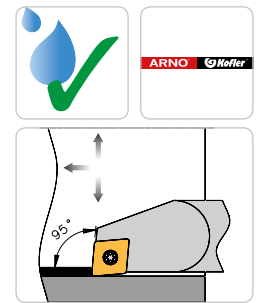
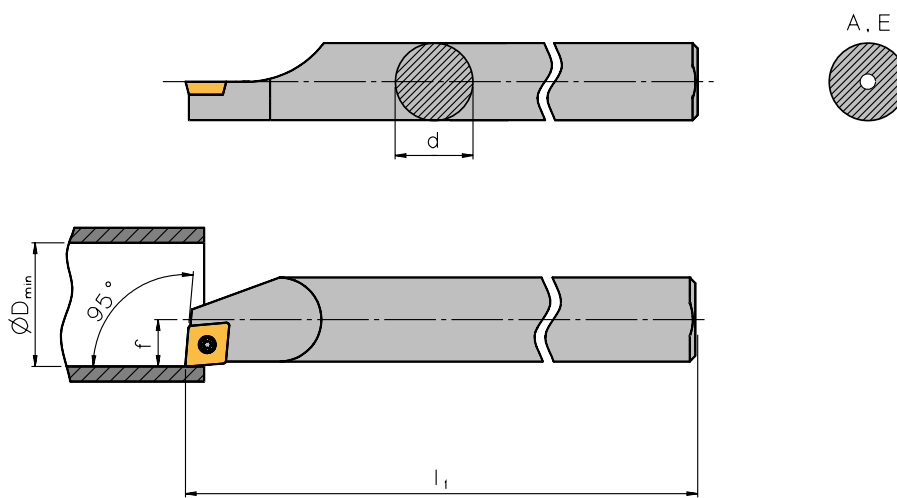
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.



## SCLD L/R

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

## Holders / Utensili / Porte-outils

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|-----|------------------|-----------------------------|
| S04E SCLDL/R 04                    | 4 | 70             | 2,4 | 4,8              | CD.. 0401...                |
| S05E SCLDL/R 04                    | 5 | 70             | 2,9 | 5,8              | CD.. 0401...                |
| S06F SCLDL/R 04                    | 6 | 80             | 3,4 | 6,8              | CD.. 0401...                |

## Holders / Utensili / Porte-outils

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|-----|------------------|-----------------------------|
| A04E SCLDL/R 04                    | 4 | 70             | 2,4 | 4,8              | CD.. 0401...                |
| A05E SCLDL/R 04                    | 5 | 70             | 2,9 | 5,8              | CD.. 0401...                |
| A06F SCLDL/R 04                    | 6 | 80             | 3,4 | 6,8              | CD.. 0401...                |

## Holders / Utensili / Porte-outils

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

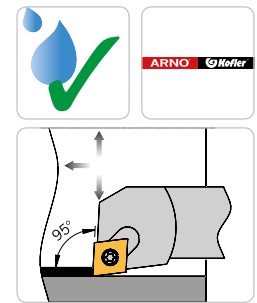
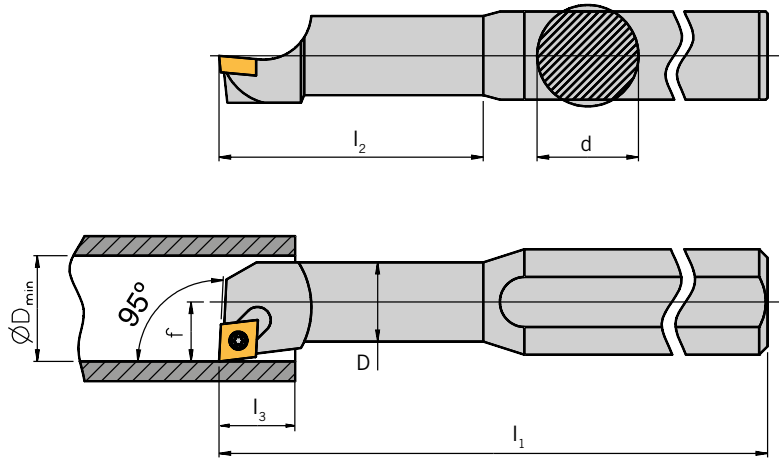
| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|-----|------------------|-----------------------------|
| E04F SCLDL/R 04                    | 4 | 80             | 2,4 | 4,8              | CD.. 0401...                |
| E05F SCLDL/R 04                    | 5 | 80             | 2,9 | 5,8              | CD.. 0401...                |
| E06G SCLDL/R 04                    | 6 | 95             | 3,4 | 6,8              | CD.. 0401...                |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SCLD L/R 04                    | T1,8.03              | KS 1886              |

**SCLD L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank / Barenì - Con stelo ridotto / Barres d'alésage - Avec corps en acier décalée

| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| S0408H SCLDL/R 04                  | 8 | 4 | 100            | 16             | 2,4 | 4,8              | CD.. 0401...                |
| S0508H SCLDL/R 04                  | 8 | 5 | 100            | 20             | 2,9 | 5,8              | CD.. 0401...                |
| S0608H SCLDL/R 04                  | 8 | 6 | 100            | 24             | 3,4 | 6,8              | CD.. 0401...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank and through tool coolant supply / Barenì - Con stelo ridotto e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier décalée et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| A0408H SCLDL/R 04                  | 8 | 4 | 100            | 16             | 2,4 | 4,8              | CD.. 0401...                |
| A0508H SCLDL/R 04                  | 8 | 5 | 100            | 20             | 2,9 | 5,8              | CD.. 0401...                |
| A0608H SCLDL/R 04                  | 8 | 6 | 100            | 24             | 3,4 | 6,8              | CD.. 0401...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed Solid carbide shank and through tool coolant supply / Barenì - Con stelo ridotto in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc décalée et alimentation interne en fluide de refroidissement

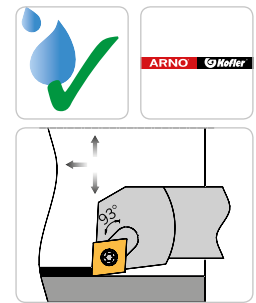
| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| E0408H SCLDL/R 04                  | 8 | 4 | 100            | 24             | 2,4 | 4,8              | CD.. 0401...                |
| E0508H SCLDL/R 04                  | 8 | 5 | 100            | 30             | 2,9 | 5,8              | CD.. 0401...                |
| E0608H SCLDL/R 04                  | 8 | 6 | 100            | 36             | 3,4 | 6,8              | CD.. 0401...                |

**Spare Parts / Ricambi / Pièces de rechange**

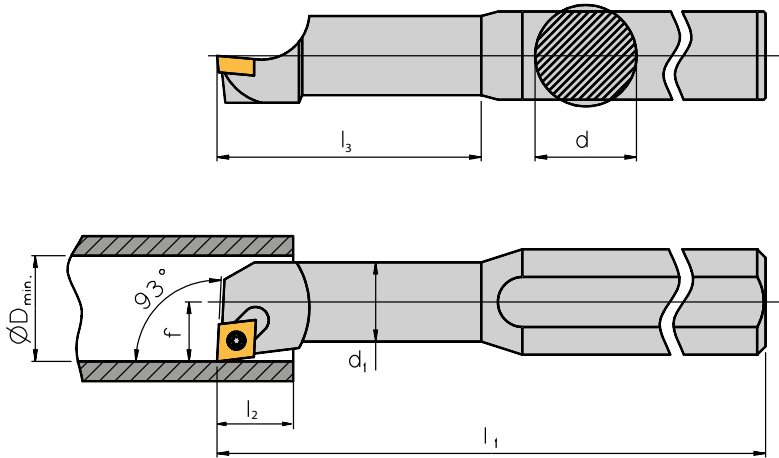
| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SCLD L/R 04                    | T1,8.03              | KS 1886              |

**SCUP L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank / Barni - Con stelo ridotto / Barres d'alésage - Avec corps en acier décalée

| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| S0608H SCUPL/R 05                  | 8  | 6  | 100            | 20             | 4,5 | 8                | CP.. 05T1...                |
| S0810J SCUPL/R 05                  | 10 | 8  | 110            | 26             | 6,0 | 11               | CP.. 05T1...                |
| S1012K SCUPL/R 05                  | 12 | 10 | 125            | 32             | 7,0 | 13               | CP.. 05T1...                |
| S1216M SCUPL/R 05                  | 16 | 12 | 150            | 40             | 9,0 | 16               | CP.. 05T1...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank and through tool coolant supply / Barni - Con stelo ridotto e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier décalée et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| A0608H SCUPL/R 05                  | 8  | 6  | 100            | 20             | 4,5 | 8                | CP.. 05T1...                |
| A0810J SCUPL/R 05                  | 10 | 8  | 110            | 26             | 6,0 | 11               | CP.. 05T1...                |
| A1012K SCUPL/R 05                  | 12 | 10 | 125            | 32             | 7,0 | 13               | CP.. 05T1...                |
| A1216M SCUPL/R 05                  | 16 | 12 | 150            | 40             | 9,0 | 16               | CP.. 05T1...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed Solid carbide shank and through tool coolant supply / Barni - Con stelo ridotto in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc décalée et alimentation interne en fluide de refroidissement

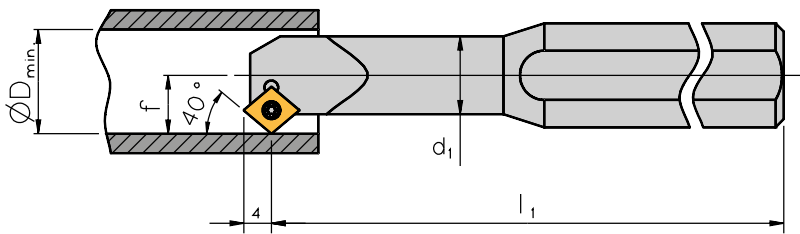
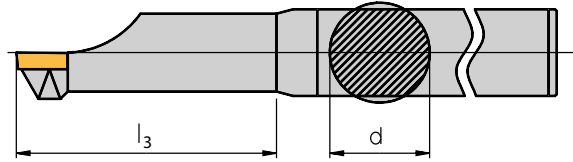
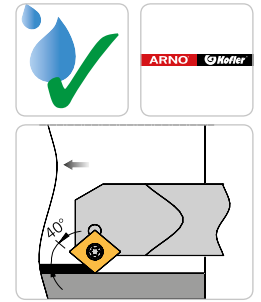
| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| E0608H SCUPL/R 05                  | 8  | 6  | 100            | 28             | 4,5 | 8                | CP.. 05T1...                |
| E0810J SCUPL/R 05                  | 10 | 8  | 110            | 36             | 6,0 | 11               | CP.. 05T1...                |
| E1012K SCUPL/R 05                  | 12 | 10 | 125            | 44             | 7,0 | 13               | CP.. 05T1...                |
| E1216M SCUPL/R 05                  | 16 | 12 | 150            | 55             | 9,0 | 16               | CP.. 05T1...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SCUP L/R 05                    | T2,2.04              | KS 5151              |

**SCXP L/R**

Approach angle 40° / Angolo di attacco 40° / Angle d'attaque 40°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank / Barni - Con stelo ridotto / Barres d'alésage - Avec corps en acier décalée

| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| S0608H SCXPR 05                    | 8  | 6  | 100            | 20             | 4,5 | 8,5              | CP.. 05T1...                |
| S0810J SCXPL/R 05                  | 10 | 8  | 110            | 26             | 6,0 | 11,0             | CP.. 05T1...                |
| S1012K SCXPL/R 05                  | 12 | 10 | 125            | 32             | 7,0 | 13,0             | CP.. 05T1...                |
| S1216M SCXPL/R 05                  | 16 | 12 | 150            | 40             | 9,0 | 16,0             | CP.. 05T1...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank and through tool coolant supply / Barni - Con stelo ridotto e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier décalée et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| A0608H SCXPL/R 05                  | 8  | 6  | 100            | 20             | 4,5 | 8,5              | CP.. 05T1...                |
| A0810J SCXPL/R 05                  | 10 | 8  | 110            | 26             | 6,0 | 11,0             | CP.. 05T1...                |
| A1012K SCXPL/R 05                  | 12 | 10 | 125            | 32             | 7,0 | 13,0             | CP.. 05T1...                |
| A1216M SCXPL/R 05                  | 16 | 12 | 150            | 40             | 9,0 | 16,0             | CP.. 05T1...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed Solid carbide shank and through tool coolant supply / Barni - Con stelo ridotto in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc décalée et alimentation interne en fluide de refroidissement

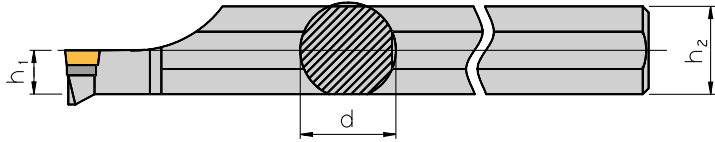
| Designation<br>Articolo<br>Article | d  | D  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----|----------------|----------------|-----|------------------|-----------------------------|
| E0608H SCXPL/R 05                  | 8  | 6  | 100            | 28             | 4,5 | 8,5              | CP.. 05T1...                |
| E0810J SCXPL/R 05                  | 10 | 8  | 110            | 36             | 6,0 | 11,0             | CP.. 05T1...                |
| E1012K SCXPL/R 05                  | 12 | 10 | 125            | 44             | 7,0 | 13,0             | CP.. 05T1...                |
| E1216M SCXPL/R 05                  | 16 | 12 | 150            | 55             | 9,0 | 16,0             | CP.. 05T1...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| ..SCXP L/R 05                     | T2,2.04              | KS 5151              |

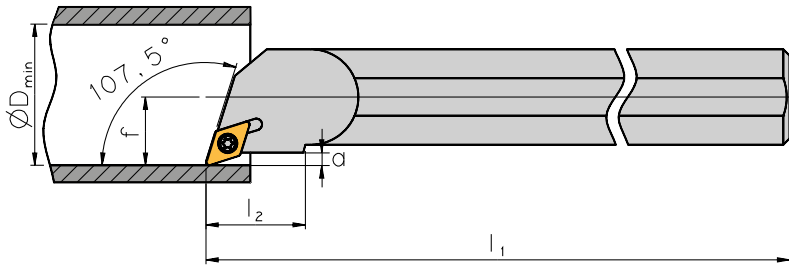
**SDQC L/R**

Approach angle 107,5° / Angolo di attacco 107,5° / Angle d'attaque 107,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| S10K SDQCL/R 07                    | 10 | 4,5            | 9              | 125            | 10,0           | 7  | 2,4 | 14,0             | DC.. 0702...                |
| S12Q SDQCL/R 07                    | 12 | 5,5            | 11             | 180            | 12,5           | 9  | 2,9 | 17,0             | DC.. 0702...                |
| S16R SDQCL/R 07                    | 16 | 7,5            | 15             | 200            | 16,5           | 11 | 2,9 | 21,0             | DC.. 0702...                |
| S20S SDQCL/R 07                    | 20 | 9,0            | 18             | 250            | 20,5           | 13 | 2,9 | 25,0             | DC.. 0702...                |
| S25T SDQCL/R 11                    | 25 | 11,5           | 23             | 300            | 26,5           | 17 | 4,4 | 31,5             | DC.. 11T3...                |
| S32U SDQCL/R 11                    | 32 | 15,0           | 30             | 350            | 33,5           | 22 | 6,0 | 40,0             | DC.. 11T3...                |
| S40V SDQCL/R 11                    | 40 | 18,5           | 37             | 400            | 41,5           | 27 | 6,9 | 49,0             | DC.. 11T3...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| A10H SDQCL/R 07                    | 10 | 4,5            | 9,0            | 100            | 10,0           | 7  | 2,4 | 14,0             | DC.. 0702...                |
| A12K SDQCL/R 07                    | 12 | 6,0            | 11,5           | 125            | 12,5           | 9  | 2,9 | 17,0             | DC.. 0702...                |
| A16M SDQCL/R 07                    | 16 | 8,0            | 15,5           | 150            | 16,5           | 11 | 2,9 | 21,0             | DC.. 0702...                |
| A16M SDQCL/R 11                    | 16 | 8,0            | 15,5           | 150            | 16,5           | 11 | 2,9 | 21,0             | DC.. 11T3...                |
| A20Q SDQCL/R 07                    | 20 | 10,0           | 19,0           | 180            | 20,5           | 13 | 2,9 | 25,0             | DC.. 0702...                |
| A20Q SDQCL/R 11                    | 20 | 10,0           | 19,0           | 180            | 20,5           | 13 | 2,9 | 25,0             | DC.. 11T3...                |
| A25R SDQCL/R 11                    | 25 | 12,5           | 24,0           | 200            | 26,5           | 17 | 4,4 | 31,5             | DC.. 11T3...                |
| A32S SDQCL/R 11                    | 32 | 16,0           | 31,0           | 250            | 33,5           | 22 | 6,0 | 40,0             | DC.. 11T3...                |
| A40T SDQCL/R 11                    | 40 | 20,0           | 38,5           | 300            | 41,5           | 27 | 6,9 | 49,0             | DC.. 11T3...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

## Holders / Utensili / Porte-outils

**Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|----------------------------|
| <b>E10K SDQCL/R 07</b>             | 10 | 5,0            | 9,5            | 125            | 10,0           | 7  | 2,4 | 14,0             | DC.. 0702...               |
| <b>E12Q SDQCL/R 07</b>             | 12 | 6,0            | 11,5           | 180            | 12,5           | 9  | 2,9 | 17,0             | DC.. 0702...               |
| <b>E16R SDQCL/R 07</b>             | 16 | 8,0            | 15,5           | 200            | 16,5           | 11 | 2,9 | 21,0             | DC.. 0702...               |
| <b>E20S SDQCL/R 07</b>             | 20 | 10,0           | 19,0           | 250            | 20,5           | 13 | 2,9 | 25,0             | DC.. 0702...               |
| <b>E20S SDQCL/R 11</b>             | 20 | 10,0           | 19,0           | 250            | 20,5           | 13 | 2,9 | 25,0             | DC.. 11T3...               |
| <b>E25T SDQCL/R 11</b>             | 25 | 12,5           | 24,0           | 300            | 26,5           | 17 | 4,4 | 31,5             | DC.. 11T3...               |

2

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| <b>.. 10.. SDQC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 12.. SDQC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 16.. SDQC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 20.. SDQC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 20.. SDQC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |
| <b>.. 25.. SDQC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |
| <b>.. 32.. SDQC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |
| <b>.. 40.. SDQC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |

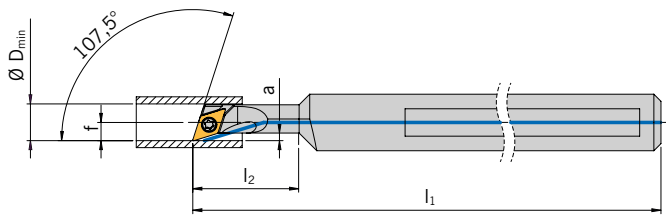
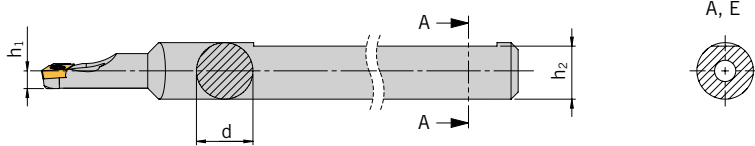
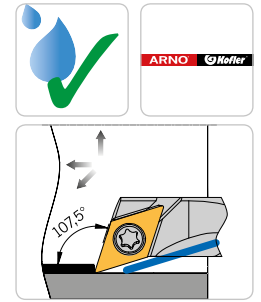
**Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.**

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SDQC L/R**

Approach angle 107,5° / Angolo di attacco 107,5° / Angle d'attaque 107,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



2

**Holders / Utensili / Porte-outils**

**Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | l <sub>2</sub> | f   | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|----------------|-----|-----|------------------|-----------------------------|
| A0408F SDQCL/R 04                  | 8 | 80             | 15             | 2,6 | 1,1 | 5,2              | DC.. 04T0...                |

**Holders / Utensili / Porte-outils**

**Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

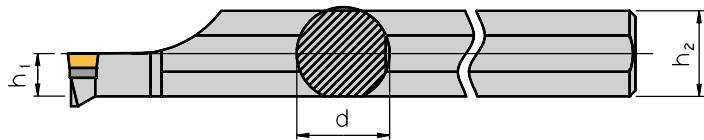
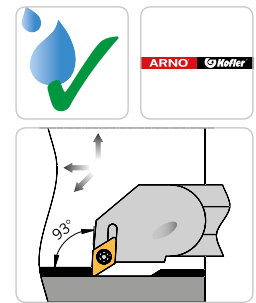
| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | l <sub>2</sub> | f   | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|----------------|-----|-----|------------------|-----------------------------|
| E0408F SDQCL/R 04                  | 8 | 80             | 26             | 2,6 | 1,1 | 5,2              | DC.. 04T0...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. 0408F SDQC L/R 04              | AS 0112              | KS 2505              |

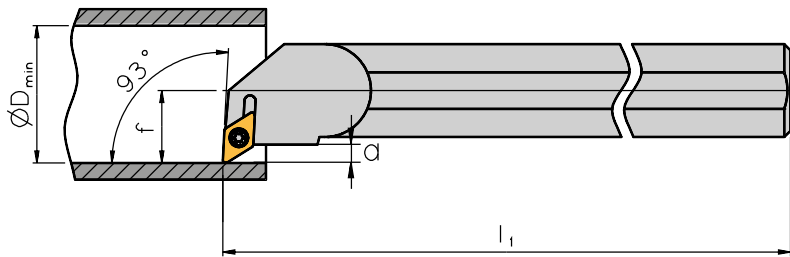
**SDUC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| S10K SDUCL/R 07                    | 10 | 4,5            | 9              | 125            | 7  | 1,9 | 14,0             | DC.. 0702...                |
| S12Q SDUCL/R 07                    | 12 | 5,5            | 11             | 180            | 9  | 2,9 | 17,0             | DC.. 0702...                |
| S16R SDUCL/R 07                    | 16 | 7,5            | 15             | 200            | 11 | 2,9 | 21,0             | DC.. 0702...                |
| S20S SDUCL/R 07                    | 20 | 9,0            | 18             | 250            | 13 | 2,9 | 25,0             | DC.. 0702...                |
| S20S SDUCL/R 11                    | 20 | 9,0            | 18             | 250            | 13 | 2,9 | 25,0             | DC.. 11T3...                |
| S25T SDUCL/R 11                    | 25 | 11,5           | 23             | 300            | 17 | 4,4 | 31,5             | DC.. 11T3...                |
| S32U SDUCL/R 11                    | 32 | 15,0           | 30             | 350            | 22 | 5,9 | 40,0             | DC.. 11T3...                |
| S40V SDUCL/R 11                    | 40 | 18,5           | 37             | 400            | 27 | 6,9 | 49,0             | DC.. 11T3...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| A10H SDUCL/R 07                    | 10 | 5,0            | 9,5            | 100            | 7  | 1,9 | 14,0             | DC.. 0702...                |
| A12K SDUCL/R 07                    | 12 | 6,0            | 11,5           | 125            | 9  | 2,9 | 17,0             | DC.. 0702...                |
| A16M SDUCL/R 07                    | 16 | 8,0            | 15,5           | 150            | 11 | 2,9 | 21,0             | DC.. 0702...                |
| A16M SDUCL/R 11                    | 16 | 8,0            | 15,5           | 150            | 11 | 2,9 | 21,0             | DC.. 11T3...                |
| A20Q SDUCL/R 07                    | 20 | 10,0           | 19,0           | 180            | 13 | 2,9 | 25,0             | DC.. 0702...                |
| A20Q SDUCL/R 11                    | 20 | 10,0           | 19,0           | 180            | 13 | 2,9 | 25,0             | DC.. 11T3...                |
| A25R SDUCL/R 11                    | 25 | 12,5           | 24,0           | 200            | 17 | 4,4 | 31,5             | DC.. 11T3...                |
| A32S SDUCL/R 11                    | 32 | 16,0           | 31,0           | 250            | 22 | 5,9 | 40,0             | DC.. 11T3...                |
| A40T SDUCL/R 11                    | 40 | 20,0           | 38,5           | 300            | 27 | 6,9 | 49,0             | DC.. 11T3...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue



## Holders / Utensili / Porte-outils

**Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | a   | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|-----|------------------|----------------------------|
| <b>E10K SDUCL/R 07</b>             | 10 | 5,0            | 9,5            | 125            | 7  | 1,9 | 14,0             | DC.. 0702...               |
| <b>E12Q SDUCL/R 07</b>             | 12 | 6,0            | 11,5           | 180            | 9  | 2,9 | 17,0             | DC.. 0702...               |
| <b>E16R SDUCL/R 07</b>             | 16 | 8,0            | 15,5           | 200            | 11 | 2,9 | 21,0             | DC.. 0702...               |
| <b>E20S SDUCL/R 11</b>             | 20 | 10,0           | 19,0           | 250            | 13 | 2,9 | 25,0             | DC.. 11T3...               |
| <b>E25T SDUCL/R 11</b>             | 25 | 12,5           | 24,0           | 300            | 17 | 4,4 | 31,5             | DC.. 11T3...               |
| <b>E32U SDUCL/R 11</b>             | 32 | 16,0           | 31,0           | 350            | 22 | 5,9 | 40,0             | DC.. 11T3...               |

2

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| <b>.. 10.. SDUC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 12.. SDUC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 16.. SDUC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 20.. SDUC L/R 07</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 20.. SDUC L/R 11</b>        | -                          | SS 1114              | -                                       | KS 1111              | S 1114                                 |
| <b>.. 25.. SDUC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |
| <b>.. 32.. SDUC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |
| <b>.. 40.. SDUC L/R 11</b>        | GBS 1111                   | SS 1111              | US 2311                                 | KS 1115              | S 2316                                 |

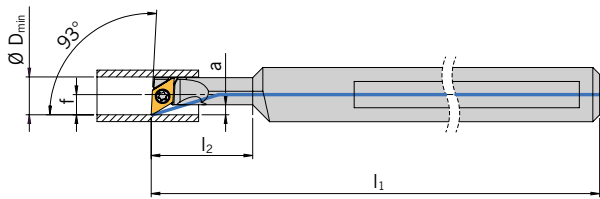
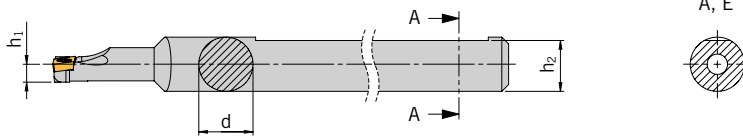
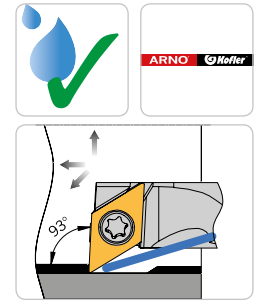
**Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.**

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SDUC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | l <sub>2</sub> | f | a   | D <sub>min</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----------------|----------------|---|-----|------------------|------------------------------|
| A0408F SDUCL/R 04                  | 8 | 80             | 15             | 3 | 1,5 | 5,6              | DC.. 04T0...                 |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

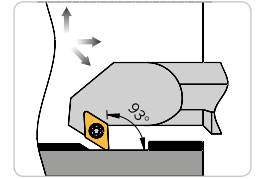
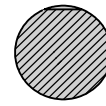
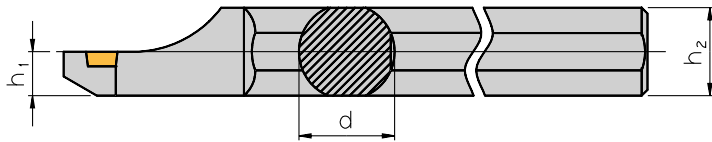
| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | l <sub>2</sub> | f | a   | D <sub>min</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----------------|----------------|---|-----|------------------|------------------------------|
| E0408F SDUCL/R 04                  | 8 | 80             | 26             | 3 | 1,5 | 5,6              | DC.. 04T0...                 |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. 0408F SDUC L/R 04              | VT1604               | BT05                 |

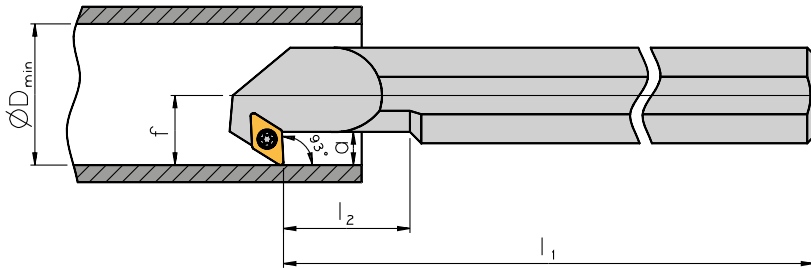
**SDXC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l     | l <sub>1</sub> | l <sub>2</sub> | f  | a    | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|-------|----------------|----------------|----|------|------------------|----------------------------|
| <b>S12Q SDXC L/R 07</b>            | 12 | 5,5            | 11             | 191,4 | 180            | 24             | 9  | 4,5  | 17,0             | DC.. 0702...               |
| <b>S16R SDXC L/R 07</b>            | 16 | 7,5            | 15             | 211,4 | 200            | 32             | 11 | 4,5  | 21,0             | DC.. 0702...               |
| <b>S20S SDXC L/R 11</b>            | 20 | 9,0            | 18             | 267,6 | 250            | 40             | 13 | 10,8 | 25,0             | DC.. 11T3...               |
| <b>S25T SDXC L/R 11</b>            | 25 | 11,5           | 23             | 317,6 | 300            | 50             | 17 | 10,8 | 31,5             | DC.. 11T3...               |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f    | a   | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|------|-----|------------------|----------------------------|
| <b>A16M SDXC L/R 07</b>            | 16 | 15,5           | 161,2          | 32             | 10,9 | 4,5 | 21               | DC.. 0702...               |

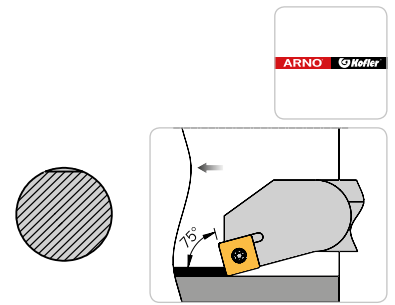
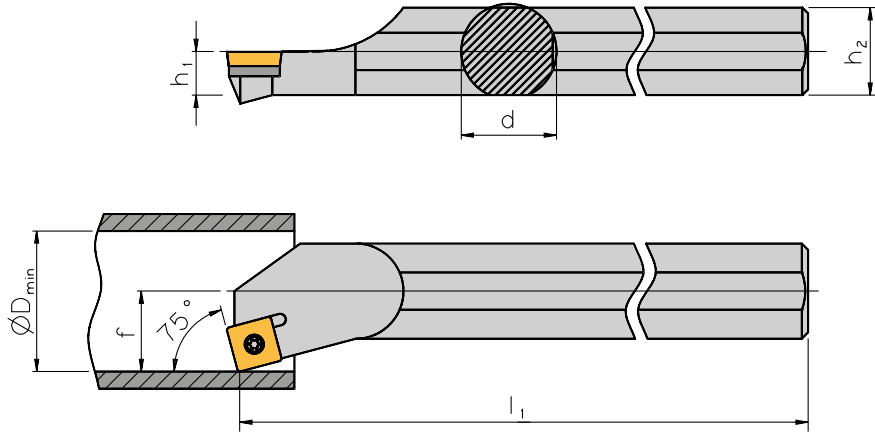
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| <b>.. 12.. SDXC L/R 07</b>        | SS 1751              | KS 1751              | S 1751                                 |
| <b>.. 16.. SDXC L/R 07</b>        | SS 1751              | KS 1751              | S 1751                                 |
| <b>.. 20.. SDXC L/R 11</b>        | SS 2314              | KS 1111              | S 2314                                 |
| <b>.. 25.. SDXC L/R 11</b>        | SS 2314              | KS 1111              | S 2314                                 |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver  
Set ricambi include: 3 Viti Torx, 1 Chiave Torx  
L'assortiment comprend : 3 vis, 1 clé

**SSKC L/R**

Approach angle 75° / Angolo di attacco 75° / Angle d'attaque 75°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| S16R SSKCL/R 09                    | 16 | 7,5            | 15             | 200            | 11 | 21,0             | SC.. 09T3...               |
| S20S SSKCL/R 09                    | 20 | 9,0            | 18             | 250            | 13 | 25,0             | SC.. 09T3...               |
| S25T SSKCL/R 09                    | 25 | 11,5           | 23             | 300            | 17 | 31,5             | SC.. 09T3...               |
| S32U SSKCL/R 12                    | 32 | 15,0           | 30             | 350            | 22 | 40,0             | SC.. 1204...               |
| S40V SSKCL/R 12                    | 40 | 18,5           | 37             | 400            | 27 | 49,0             | SC.. 1204...               |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| .. 16.. SSKC L/R 09               | -                          | SS 1114              | -                                       | KS 1111              | S 1114                                 |
| .. 20.. SSKC L/R 09               | -                          | SS 1114              | -                                       | KS 1111              | S 1114                                 |
| .. 25.. SSKC L/R 09               | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| .. 32.. SSKC L/R 12               | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |
| .. 40.. SSKC L/R 12               | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |

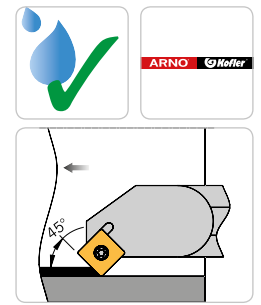
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

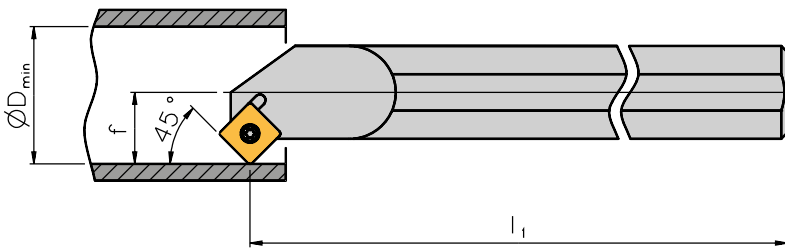
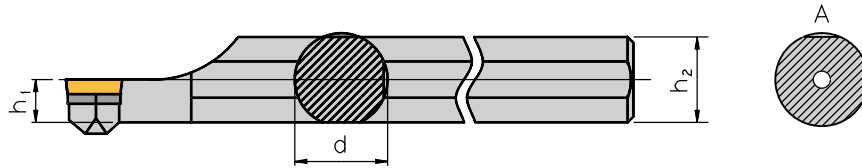
L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**SSSC L/R**

Approach angle 45° / Angolo di attacco 45° / Angle d'attaque 45°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l     | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|-------|----------------|----|------------------|-----------------------------|
| S16R SSSCL/R 09                    | 16 | 7,5            | 15             | 206,1 | 200            | 11 | 21,0             | SC.. 09T3...                |
| S20S SSSCL/R 09                    | 20 | 9,0            | 18             | 256,1 | 250            | 13 | 25,0             | SC.. 09T3...                |
| S25T SSSCL/R 09                    | 25 | 11,5           | 23             | 306,1 | 300            | 17 | 31,5             | SC.. 09T3...                |
| S32U SSSCL/R 12                    | 32 | 15,0           | 30             | 358,3 | 350            | 22 | 40,0             | SC.. 1204...                |
| S40V SSSCL/R 12                    | 40 | 18,5           | 37             | 408,3 | 400            | 27 | 49,0             | SC.. 1204...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l     | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|-------|----------------|----|------------------|-----------------------------|
| A16M SSSCL/R 09                    | 16 | 8,0            | 15,5           | 156,1 | 150            | 11 | 21,0             | SC.. 09T3...                |
| A20Q SSSCL/R 09                    | 20 | 10,0           | 19,0           | 186,1 | 180            | 13 | 25,0             | SC.. 09T3...                |
| A25R SSSCL/R 09                    | 25 | 12,5           | 24,0           | 206,1 | 200            | 17 | 31,5             | SC.. 09T3...                |
| A32S SSSCL/R 12                    | 32 | 16,0           | 31,0           | 256,1 | 250            | 22 | 40,0             | SC.. 1204...                |
| A40T SSSCL/R 12                    | 40 | 20,0           | 38,5           | 306,1 | 300            | 27 | 49,0             | SC.. 1204...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

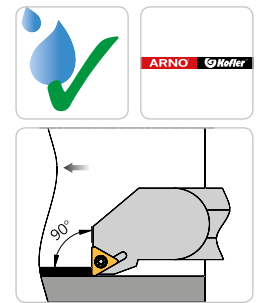
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| .. 16.. SSSC L/R 09               | -                          | SS 1114              | -                                       | KS 1111              | S 1114                                 |
| .. 20.. SSSC L/R 09               | -                          | SS 1114              | -                                       | KS 1111              | S 1114                                 |
| .. 25.. SSSC L/R 09               | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| .. 32.. SSSC L/R 12               | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |
| .. 40.. SSSC L/R 12               | GBS 1221                   | SS 1221              | US 4221                                 | KS 1115              | S 4226                                 |

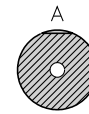
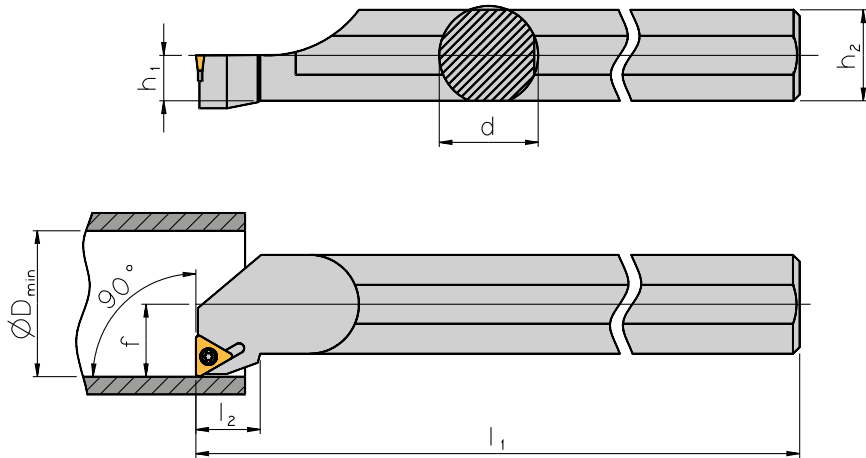
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.  
Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola  
L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**STFC L/R**

Approach angle 90° / Angolo di attacco 90° / Angle d'attaque 90°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| S10K STFCL/R 09                    | 10 | 4,5            | 9              | 125            | 12             | 7  | 14,0             | TC.. 0902...                |
| S12Q STFCL/R 11                    | 12 | 5,5            | 11             | 180            | 13             | 9  | 17,0             | TC.. 1102...                |
| S16R STFCL/R 11                    | 16 | 7,5            | 15             | 200            | 13             | 11 | 21,0             | TC.. 1102...                |
| S20S STFCL/R 11                    | 20 | 9,0            | 18             | 250            | 13             | 13 | 25,0             | TC.. 1102...                |
| S25T STFCL/R 16                    | 25 | 11,5           | 23             | 300            | 21             | 17 | 31,5             | TC.. 16T3...                |
| S32U STFCL/R 16                    | 32 | 15,0           | 30             | 350            | 21             | 22 | 40,0             | TC.. 16T3...                |
| S40V STFCL/R 16                    | 40 | 18,5           | 37             | 400            | 21             | 27 | 49,0             | TC.. 16T3...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|------------------|-----------------------------|
| A10H STFCL/R 09                    | 10 | 5,0            | 9,5            | 100            | 12             | 7  | 14,0             | TC.. 0902...                |
| A12K STFCL/R 11                    | 12 | 6,0            | 11,5           | 125            | 13             | 9  | 17,0             | TC.. 1102...                |
| A16M STFCL/R 11                    | 16 | 8,0            | 15,5           | 150            | 13             | 11 | 21,0             | TC.. 1102...                |
| A20Q STFCL/R 11                    | 20 | 10,0           | 19,0           | 180            | 13             | 13 | 25,0             | TC.. 1102...                |
| A25R STFCL/R 16                    | 25 | 12,5           | 24,0           | 200            | 21             | 17 | 31,5             | TC.. 16T3...                |
| A32S STFCL/R 16                    | 32 | 16,0           | 31,0           | 250            | 21             | 22 | 40,0             | TC.. 16T3...                |
| A40T STFCL/R 16                    | 40 | 20,0           | 38,5           | 300            | 21             | 27 | 49,0             | TC.. 16T3...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| .. 10.. STFCL L/R 09              | -                          | SS 5151              | -                                       | KS 5151              | S 5151                                 |
| .. 12.. STFCL L/R 11              | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br><i>Utensile</i><br>Porte-Outil | Bush<br><i>Bussola</i><br>Douille | Screw<br><i>Vite</i><br>Vis | Support pad<br><i>Supporto</i><br>Cale-support | Key<br><i>Chiave</i><br>Clé | Spare part set<br><i>Set ricambi</i><br>Gamme |
|--|-----------------------------------|-----------------------------|--|-----------------------------|---|
| .. 16.. STFC L/R 11                      | -                                 | SS 1751                     | -  | KS 1751                     | S 1751  |
| .. 20.. STFC L/R 11                      | -                                 | SS 1751                     | -  | KS 1751                     | S 1751  |
| .. 25.. STFC L/R 16                      | GBS 1111                          | SS 1111                     | US 5511  | KS 1115                     | S 5516  |
| .. 32.. STFC L/R 16                      | GBS 1111                          | SS 1111                     | US 5511  | KS 1115                     | S 5516  |
| .. 40.. STFC L/R 16                      | GBS 1111                          | SS 1111                     | US 5511  | KS 1115                     | S 5516  |

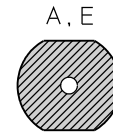
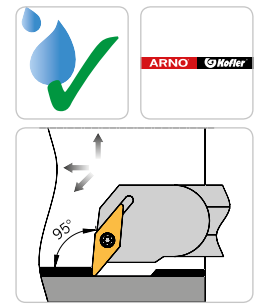
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

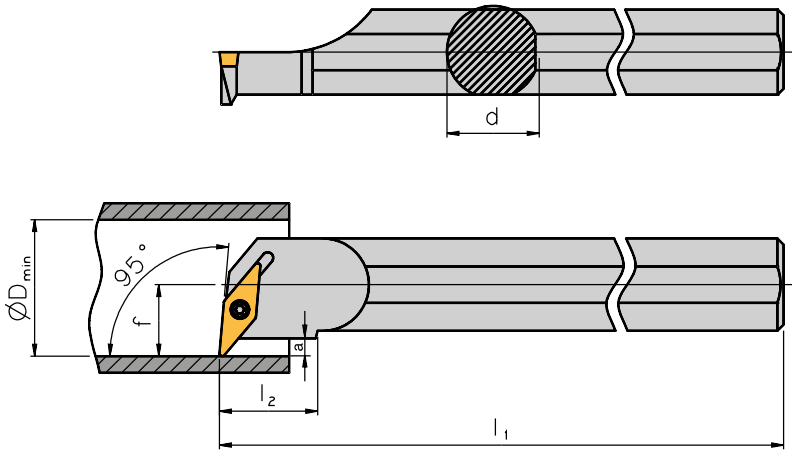
**SVLC L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| S10H SVLCL/R 07                    | 10 | 100            | 22             | 7  | 5 | 12,5             | VC.. 0702...                |
| S12K SVLCL/R 07                    | 12 | 125            | 28             | 9  | 6 | 15,5             | VC.. 0702...                |
| S16M SVLCL/R 07                    | 16 | 150            | 36             | 11 | 5 | 19,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| A08F SVLCL/R 05                    | 8  | 80             | 15             | 5  | 3 | 9,2              | VC.. 0501...                |
| A10H SVLCL/R 07                    | 10 | 100            | 22             | 7  | 5 | 12,5             | VC.. 0702...                |
| A12K SVLCL/R 07                    | 12 | 125            | 28             | 9  | 6 | 15,5             | VC.. 0702...                |
| A16M SVLCL/R 07                    | 16 | 150            | 36             | 11 | 5 | 19,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| E08F SVLCL/R 05                    | 8  | 80             | 26             | 5  | 3 | 9,2              | VC.. 0501...                |
| E10H SVLCL/R 07                    | 10 | 100            | 32             | 7  | 5 | 12,5             | VC.. 0702...                |
| E12K SVLCL/R 07                    | 12 | 125            | 40             | 9  | 6 | 15,5             | VC.. 0702...                |
| E16M SVLCL/R 07                    | 16 | 150            | 55             | 11 | 5 | 19,5             | VC.. 0702...                |

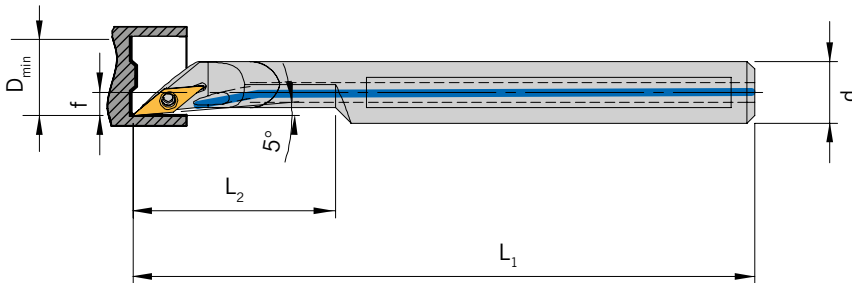
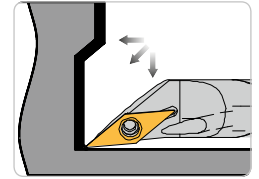
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SVLC L/R 05                    | VT1604               | BT05                 |
| .. SVLC L/R 07                    | SS 5140              | KS 1886              |



**SVJC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



2

**Holders / Utensili / Porte-outils**

**Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

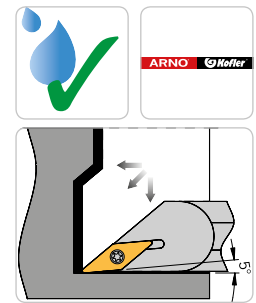
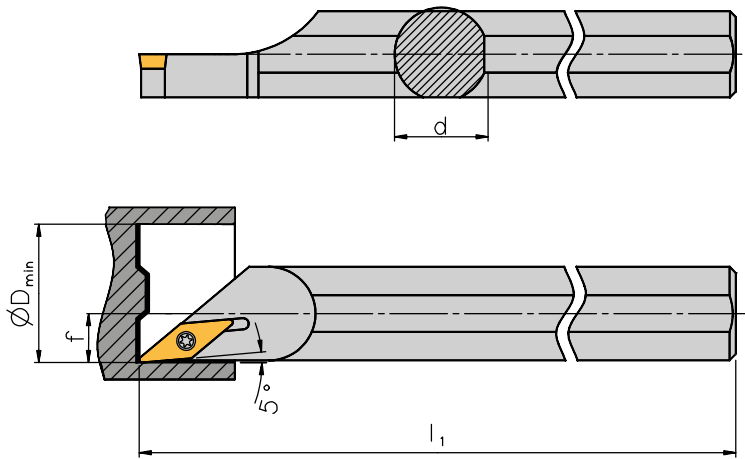
| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|-----|------------------|-----------------------------|
| A08F SVJCL/R 05                    | 8  | 80             | 15             | 1,0 | 8                | VC.. 0502..                 |
| A10K SVJCL/R 07                    | 10 | 125            | 18             | 1,5 | 13               | VC.. 0702...                |
| A12L SVJCL/R 07                    | 12 | 140            | 18             | 1,5 | 13               | VC.. 0702...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SVJC L/R 05                    | AS 0112              | KS 2505              |
| .. SVJC L/R 07                    | SS 5140              | KS 1886              |

**SVOC L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | f    | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|------|------------------|-----------------------------|
| A10H SVOCL/R 07                    | 10 | 100            | 5,5  | 13               | VC.. 0702...                |
| A12K SVOCL/R 07                    | 12 | 125            | 6,5  | 13               | VC.. 0702...                |
| A16M SVOCL/R 11                    | 16 | 150            | 8,5  | 17               | VC.. 1103...                |
| A20Q SVOCL/R 11                    | 20 | 180            | 10,5 | 22               | VC.. 1103...                |
| A25R SVOCL/R 11                    | 25 | 200            | 13,0 | 26               | VC.. 1103...                |
| A32S SVOCL/R 16                    | 32 | 250            | 16,5 | 38               | VC.. 1604...                |
| A40T SVOCL/R 16                    | 40 | 300            | 21,0 | 42               | VC.. 1604...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------|----------------------|--|
| .. SVOC L/R 07                    | SS 5140              | KS 1886              | -                                      |
| .. SVOC L/R 11                    | SS 1751              | KS 1751              | S 1751                                 |
| .. SVOC L/R 16                    | SS 1111              | KS 1115              | S 6527                                 |

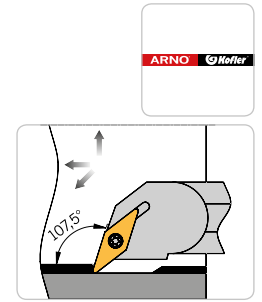
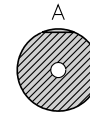
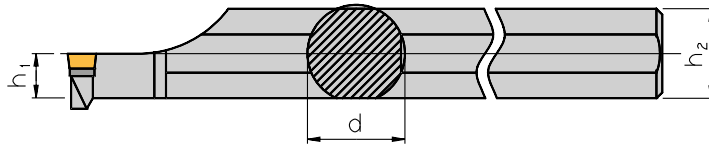
Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver

Set ricambi include: 3 Viti Torx, 1 Chiave Torx

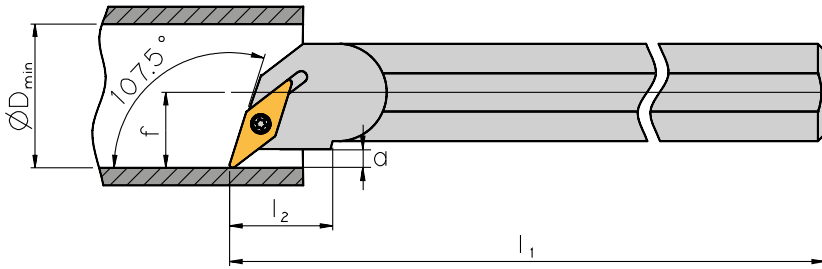
L'assortiment comprend : 3 vis, 1 clé

**SVQC L/R**

Approach angle 107,5° / Angolo di attacco 107,5° / Angle d'attaque 107,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| S16R SVQCL/R 11                    | 16 | 7,5            | 15             | 200            | 16,5           | 11 | 2,9 | 21,0             | VC.. 1103...                |
| S20S SVQCL/R 11                    | 20 | 9,0            | 18             | 250            | 20,5           | 13 | 2,9 | 25,0             | VC.. 1103...                |
| S25T SVQCL/R 11                    | 25 | 11,5           | 23             | 300            | 25,5           | 17 | 4,4 | 31,5             | VC.. 1103...                |
| S32U SVQCL/R 16                    | 32 | 15,0           | 30             | 350            | 33,5           | 22 | 5,9 | 40,0             | VC.. 1604...                |
| S40V SVQCL/R 16                    | 40 | 18,5           | 37             | 400            | 40,0           | 27 | 6,9 | 49,0             | VC.. 1604...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| A16M SVQCL/R 11                    | 16 | 8,0            | 15,5           | 150            | 16,5           | 11 | 2,9 | 21,0             | VC.. 1103...                |
| A20Q SVQCL/R 11                    | 20 | 10,0           | 19,0           | 180            | 20,5           | 13 | 2,9 | 25,0             | VC.. 1103...                |
| A25R SVQCL/R 11                    | 25 | 12,5           | 24,0           | 200            | 25,5           | 17 | 4,3 | 31,5             | VC.. 1103...                |
| A32S SVQCL/R 16                    | 32 | 16,0           | 31,0           | 250            | 33,5           | 22 | 5,9 | 40,0             | VC.. 1604...                |
| A40T SVQCL/R 16                    | 40 | 20,0           | 38,5           | 300            | 40,0           | 27 | 6,9 | 49,0             | VC.. 1604...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme      |
|-----------------------------------|----------------------------|----------------------|---|----------------------|---|
| .. SVQC L/R 11                    | -                          | SS 1751              | -   | KS 1751              | S 1751                                      |
| .. SVQC L/R 16                    | GBS 1111                   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | KS 1115              | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup> |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

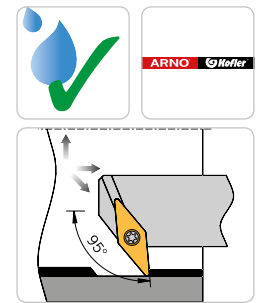
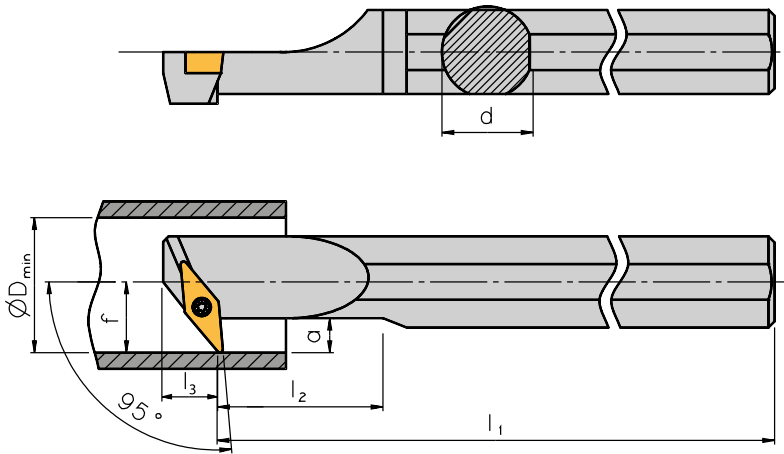
L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

1) For indexable insert with radius 0.8 mm / Per inserti con Raggio 0,8 mm / Pour plaquettes de coupe amovibles avec un rayon de 0,8 mm

2) For indexable inserts with radius greater than 0.8 mm / Per inserti con un raggio maggiore di 0,8 mm / Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

**SV95C L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|---|------------------|-----------------------------|
| S10H SV95CL/R 07                   | 10 | 100            | 22             | 7,3            | 7  | 5 | 12,5             | VC.. 0702...                |
| S12K SV95CL/R 07                   | 12 | 125            | 28             | 6,5            | 9  | 6 | 15,5             | VC.. 0702...                |
| S16M SV95CL/R 07                   | 16 | 150            | 36             | 7,0            | 11 | 5 | 17,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|---|------------------|-----------------------------|
| A08F SV95CL/R 05                   | 8  | 80             | 15             | -              | 5  | 3 | 9,2              | VC.. 0501...                |
| A10H SV95CL/R 07                   | 10 | 100            | 22             | 7,3            | 7  | 5 | 12,5             | VC.. 0702...                |
| A12K SV95CL/R 07                   | 12 | 125            | 28             | 6,5            | 6  | 6 | 15,5             | VC.. 0702...                |
| A16M SV95CL/R 07                   | 16 | 150            | 36             | 7,0            | 11 | 5 | 17,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

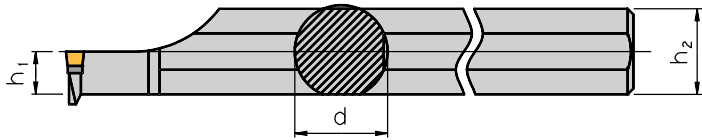
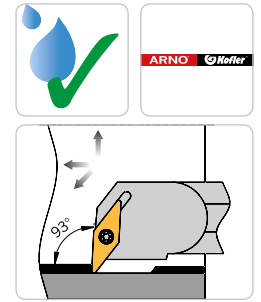
| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|---|------------------|-----------------------------|
| E08F SV95CL/R 05                   | 8  | 80             | 26             | -              | 5  | 3 | 9,2              | VC.. 0501...                |
| E10H SV95CL/R 07                   | 10 | 100            | 32             | 7,3            | 7  | 5 | 12,5             | VC.. 0702...                |
| E12K SV95CL/R 07                   | 12 | 125            | 40             | 6,5            | 9  | 6 | 15,5             | VC.. 0702...                |
| E16M SV95CL/R 07                   | 16 | 150            | 55             | 7,0            | 11 | 5 | 17,5             | VC.. 0702...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SV95C L/R 05                   | AS 0112              | KS 2505              |
| .. SV95C L/R 07                   | SS 5140              | KS 1886              |

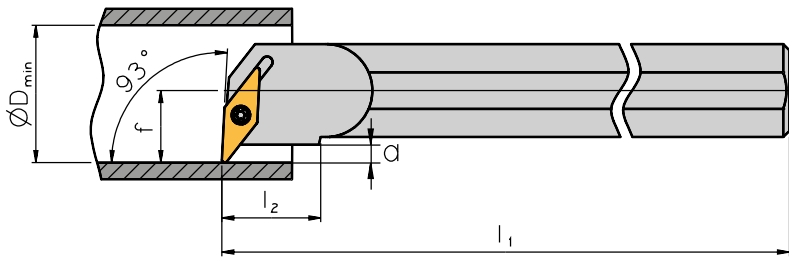
SVUC L/R

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2



Holders / Utensili / Porte-outils

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| S16R SVUCL/R 11                    | 16 | 7,5            | 15             | 200            | 16,5           | 11 | 3,1 | 21,0             | VC.. 1103...                |
| S20S SVUCL/R 11                    | 20 | 9,0            | 18             | 250            | 20,5           | 13 | 3,1 | 25,0             | VC.. 1103...                |
| S25T SVUCL/R 11                    | 25 | 11,5           | 23             | 300            | 25,5           | 17 | 4,4 | 31,5             | VC.. 1103...                |
| S32U SVUCL/R 16                    | 32 | 15,0           | 30             | 350            | 33,5           | 22 | 5,9 | 40,0             | VC.. 1604...                |
| S40V SVUCL/R 16                    | 40 | 18,5           | 37             | 400            | 40,0           | 27 | 7,1 | 49,0             | VC.. 1604...                |

Holders / Utensili / Porte-outils

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| A16M SVUCL/R 11                    | 16 | 8,0            | 15,5           | 150            | 16,5           | 11 | 3,1 | 21,0             | VC.. 1103...                |
| A20Q SVUCL/R 11                    | 20 | 10,0           | 19,0           | 180            | 20,5           | 13 | 3,1 | 25,0             | VC.. 1103...                |
| A25R SVUCL/R 11                    | 25 | 12,5           | 24,0           | 200            | 25,5           | 17 | 4,3 | 31,5             | VC.. 1103...                |
| A32S SVUCL/R 16                    | 32 | 16,0           | 31,0           | 250            | 33,5           | 22 | 5,9 | 40,0             | VC.. 1604...                |
| A40T SVUCL/R 16                    | 40 | 20,0           | 38,5           | 300            | 40,0           | 27 | 7,1 | 49,0             | VC.. 1604...                |

! Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA - A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

Holders / Utensili / Porte-outils

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | l <sub>2</sub> | f  | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----------------|----|-----|------------------|-----------------------------|
| E16R SVUCL/R 11                    | 16 | 8,0            | 15,5           | 200            | 16,5           | 11 | 2,9 | 21,0             | VC.. 1103...                |
| E20S SVUCL/R 11                    | 20 | 10,0           | 19,0           | 250            | 20,5           | 13 | 2,9 | 25,0             | VC.. 1103...                |
| E25T SVUCL/R 11                    | 25 | 12,5           | 24,0           | 300            | 25,5           | 17 | 4,3 | 31,5             | VC.. 1103...                |

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br><i>Utensile</i><br>Porte-Outil | Bush<br><i>Bussola</i><br>Douille | Screw<br><i>Vite</i><br>Vis | Support pad<br><i>Supporto</i><br>Cale-support | Key<br><i>Chiave</i><br>Clé | Spare part set<br><i>Set ricambi</i><br>Gamme |
|--|-----------------------------------|-----------------------------|--|-----------------------------|---|
| .. 16.. SVUC L/R 11                      | -                                 | SS 1751                     | -  | KS 1751                     | S 1751  |
| .. 20.. SVUC L/R 11                      | -                                 | SS 1751                     | -  | KS 1751                     | S 1751  |
| .. 25.. SVUC L/R 11                      | -                                 | SS 1751                     | -  | KS 1751                     | S 1751  |
| .. 32.. SVUC L/R 16                      | GBS 1111                          | SS 1111                     | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup>  | KS 1115                     | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup>   |
| .. 40.. SVUC L/R 16                      | GBS 1111                          | SS 1111                     | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup>  | KS 1115                     | S 6527 <sup>1)</sup> / S 6528 <sup>2)</sup>   |

Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

**1) For indexable inserts with radius up to 0.8 mm**

*Per inserti con un raggio fino a 0,8 mm*

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

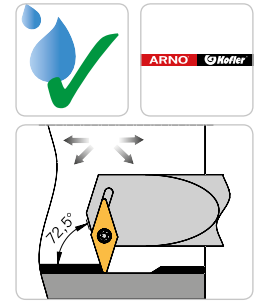
**2) For indexable inserts with radius greater than 0.8 mm**

*Per inserti con un raggio maggiore di 0,8 mm*

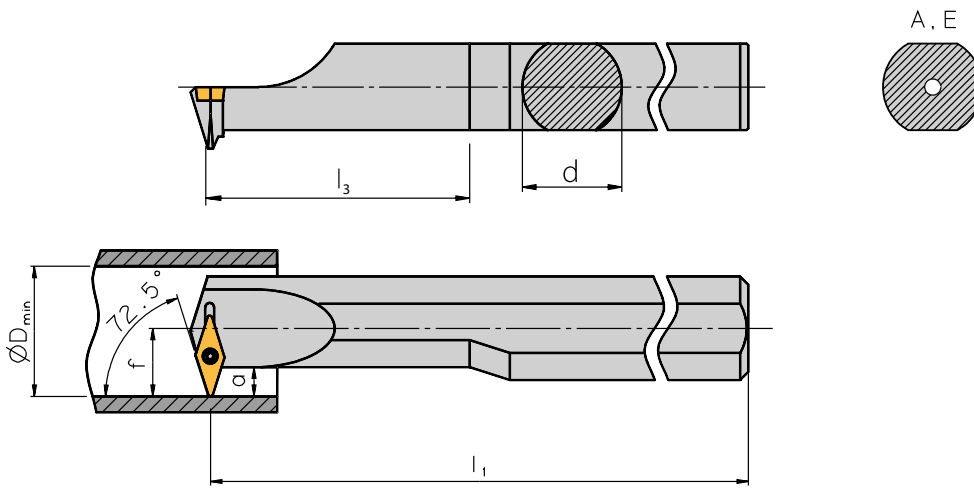
Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

**SVVC L/R**

Approach angle 72,5° / Angolo di attacco 72,5° / Angle d'attaque 72,5°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| S10H SVVCL/R 07                    | 10 | 100            | 22             | 8  | 6 | 13,5             | VC.. 0702...                |
| S12K SVVCL/R 07                    | 12 | 125            | 28             | 9  | 6 | 15,5             | VC.. 0702...                |
| S16M SVVCL/R 07                    | 16 | 150            | 36             | 11 | 5 | 17,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f    | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|------|-----|------------------|-----------------------------|
| A08F SVVCL/R 05                    | 8  | 80             | 15             | 5,5  | 3,5 | 9,7              | VC.. 0501...                |
| A10H SVVCL/R 07                    | 10 | 100            | 22             | 8,0  | 6,0 | 13,5             | VC.. 0702...                |
| A12K SVVCL/R 07                    | 12 | 125            | 28             | 9,0  | 6,0 | 15,5             | VC.. 0702...                |
| A16M SVVCL/R 07                    | 16 | 150            | 36             | 11,0 | 5,0 | 17,5             | VC.. 0702...                |

**Holders / Utensili / Porte-outils**

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f    | a   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|------|-----|------------------|-----------------------------|
| E08F SVVCL/R 05                    | 8  | 80             | 15             | 5,5  | 3,5 | 9,7              | VC.. 0501...                |
| E10H SVVCL/R 07                    | 10 | 100            | 32             | 8,0  | 6,0 | 13,5             | VC.. 0702...                |
| E12K SVVCL/R 07                    | 12 | 125            | 40             | 9,0  | 6,0 | 15,5             | VC.. 0702...                |
| E16M SVVCL/R 07                    | 16 | 150            | 55             | 11,0 | 5,0 | 17,5             | VC.. 0702...                |

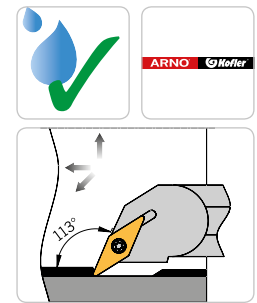
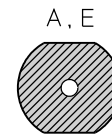
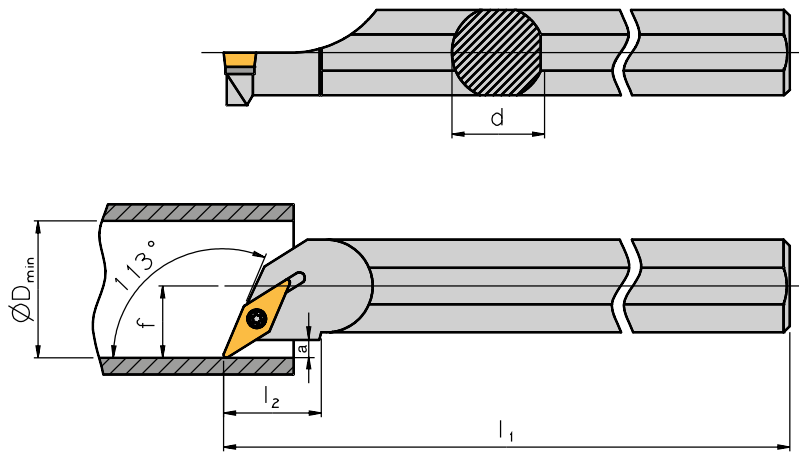
**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SVVC L/R 05                    | VT1604               | BT05                 |
| .. SVVC L/R 07                    | SS 5140              | KS 1886              |

## SVXC L/R

Approach angle 113° / Angolo di attacco 113° / Angle d'attaque 113°

With screw clamping / Con bloccaggio a vite / Avec serrage par vis

Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

## Holders / Utensili / Porte-outils

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| S10H SVXCL/R 07                    | 10 | 100            | 22             | 7  | 3 | 12,5             | VC.. 0702...                |
| S12K SVXCL/R 07                    | 12 | 125            | 28             | 9  | 3 | 15,5             | VC.. 0702...                |
| S16M SVXCL/R 07                    | 16 | 150            | 36             | 11 | 3 | 19,5             | VC.. 0702...                |

## Holders / Utensili / Porte-outils

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| A08F SVXCL/R 05                    | 8  | 80             | 15             | 5  | 3 | 9,2              | VC.. 0501...                |
| A10H SVXCL/R 07                    | 10 | 100            | 22             | 7  | 3 | 12,5             | VC.. 0702...                |
| A12K SVXCL/R 07                    | 12 | 125            | 28             | 9  | 3 | 15,5             | VC.. 0702...                |
| A16M SVXCL/R 07                    | 16 | 150            | 36             | 11 | 3 | 19,5             | VC.. 0702...                |

## Holders / Utensili / Porte-outils

Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | l <sub>1</sub> | l <sub>2</sub> | f  | a | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|---|------------------|-----------------------------|
| E08F SVXCL/R 05                    | 8  | 80             | 26             | 5  | 3 | 9,2              | VC.. 0501...                |
| E10H SVXCL/R 07                    | 10 | 100            | 32             | 7  | 3 | 12,5             | VC.. 0702...                |
| E12K SVXCL/R 07                    | 12 | 125            | 40             | 9  | 3 | 15,5             | VC.. 0702...                |
| E16M SVXCL/R 07                    | 16 | 150            | 55             | 11 | 3 | 19,5             | VC.. 0702...                |

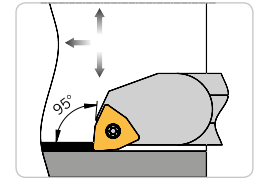
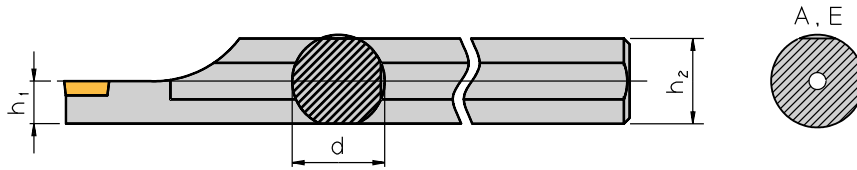
## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SVXC R/L 07                    | VT1604               | BT05                 |

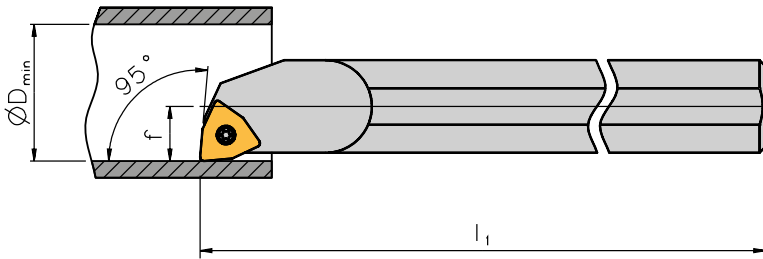


**SWLC L/R**

Approach angle 95° / Angolo di attacco 95° / Angle d'attaque 95°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



2

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank / Barenì - Con stelo in acciaio / Barres d'alésage - Avec corps en acier

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|-----------------------------|
| S08H SWLCL/R 04                    | 8  | 3,5            | 7              | 100            | 5  | 11,0             | WC.. 0402...                |
| S10K SWLCL/R 04                    | 10 | 4,5            | 9              | 125            | 7  | 14,0             | WC.. 0402...                |
| S12Q SWLCL/R 04                    | 12 | 5,5            | 11             | 180            | 9  | 17,0             | WC.. 0402...                |
| S16R SWLCL/R 06                    | 16 | 7,5            | 15             | 200            | 11 | 21,0             | WC.. 06T3...                |
| S20S SWLCL/R 06                    | 20 | 9,0            | 18             | 250            | 13 | 25,0             | WC.. 06T3...                |
| S25T SWLCL/R 06                    | 25 | 11,5           | 23             | 300            | 17 | 31,5             | WC.. 06T3...                |
| S32U SWLCL/R 08                    | 32 | 15,0           | 30             | 350            | 22 | 40,0             | WC.. 0804...                |
| S40V SWLCL/R 08                    | 40 | 18,5           | 37             | 400            | 27 | 49,0             | WC.. 0804...                |

**Holders / Utensili / Porte-outils**

Boring bars - With steel shank and through tool coolant supply / Barenì - Con stelo in acciaio e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en acier et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|-----------------------------|
| A08F SWLCL/R 04                    | 8  | 4,0            | 7,5            | 80             | 5  | 11,0             | WC.. 0402...                |
| A10H SWLCL/R 04                    | 10 | 5,0            | 9,5            | 100            | 7  | 14,0             | WC.. 0402...                |
| A12K SWLCL/R 04                    | 12 | 6,0            | 11,5           | 125            | 9  | 17,0             | WC.. 0402...                |
| A16M SWLCL/R 06                    | 16 | 8,0            | 15,5           | 150            | 11 | 21,0             | WC.. 06T3...                |
| A20Q SWLCL/R 06                    | 20 | 10,0           | 19,0           | 180            | 13 | 25,0             | WC.. 06T3...                |
| A25R SWLCL/R 06                    | 25 | 12,5           | 24,0           | 200            | 17 | 31,5             | WC.. 06T3...                |
| A32S SWLCL/R 08                    | 32 | 16,0           | 31,0           | 250            | 22 | 40,0             | WC.. 0804...                |
| A40T SWLCL/R 08                    | 40 | 20,0           | 38,5           | 300            | 27 | 49,0             | WC.. 0804...                |

**!** Remark: A - execution with cylindrical part at the end of the shank  
Nota: FORMA -A con zona cilindrica alla fine dello stelo  
Remarque : A - version cylindrique à l'arrière de la queue

## Holders / Utensili / Porte-outils

**Boring bars - With solid carbide shank and through tool coolant supply / Barenì - Con stelo in metallo duro e adduzione del refrigerante interna /**  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d  | h <sub>1</sub> | h <sub>2</sub> | l <sub>1</sub> | f  | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|----------------|----|------------------|----------------------------|
| <b>E08H SWLCL/R 04</b>             | 8  | 4,0            | 7,5            | 100            | 5  | 11,0             | WC.. 0402...               |
| <b>E10K SWLCL/R 04</b>             | 10 | 5,0            | 9,5            | 125            | 7  | 14,0             | WC.. 0402...               |
| <b>E12Q SWLCL/R 04</b>             | 12 | 6,0            | 11,5           | 180            | 9  | 17,0             | WC.. 0402...               |
| <b>E16R SWLCL/R 06</b>             | 16 | 8,0            | 15,5           | 200            | 11 | 21,0             | WC.. 06T3...               |
| <b>E20S SWLCL/R 06</b>             | 20 | 10,0           | 19,0           | 250            | 13 | 25,0             | WC.. 06T3...               |
| <b>E25T SWLCL/R 06</b>             | 25 | 12,5           | 24,0           | 300            | 17 | 31,5             | WC.. 06T3...               |

2

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Bush<br>Bussola<br>Douille | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé | Spare part set<br>Set ricambi<br>Gamme |
|-----------------------------------|----------------------------|----------------------|---|----------------------|--|
| <b>.. 08.. SWLC L/R 04</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 10.. SWLC L/R 04</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 12.. SWLC L/R 04</b>        | -                          | SS 1751              | -                                       | KS 1751              | S 1751                                 |
| <b>.. 16.. SWLC L/R 06</b>        | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| <b>.. 20.. SWLC L/R 06</b>        | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| <b>.. 25.. SWLC L/R 06</b>        | -                          | SS 1111              | -                                       | KS 1111              | S 1111                                 |
| <b>.. 32.. SWLC L/R 08</b>        | GBS 1221                   | SS 1221              | US 8821                                 | KS 1115              | S 8821                                 |
| <b>.. 40.. SWLC L/R 08</b>        | GBS 1221                   | SS 1221              | US 8821                                 | KS 1115              | S 8821                                 |

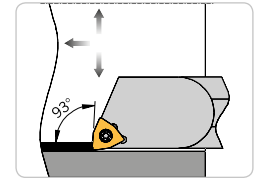
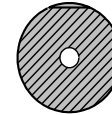
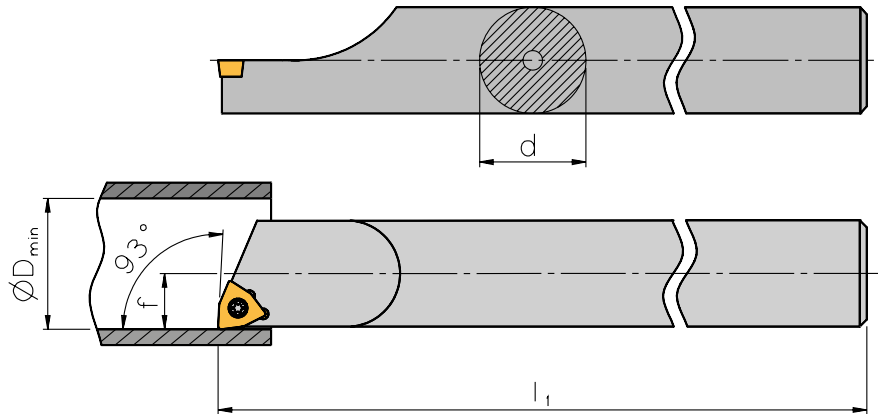
**Complete set consists of: 3 pieces Torx-screws, 1 piece Torx-screwdriver and depending on type of toolholder 1 piece support pad, 1 piece bush.**

Set ricambi include: 3 Viti Torx, 1 Chiave Torx, e dove previste, Supporto, 1 Bussola

L'assortiment comprend : 3 vis, 1 clé et, selon le modèle de porte-outils, 1 support et 1 douille.

## SWUC L/R

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

Boring bars - With solid carbide shank and through tool coolant supply / Barni - Con stelo in metallo duro e adduzione del refrigerante interna /  
Barres d'alésage - Avec corps en carbure monobloc et alimentation interne en fluide de refroidissement

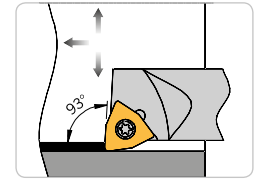
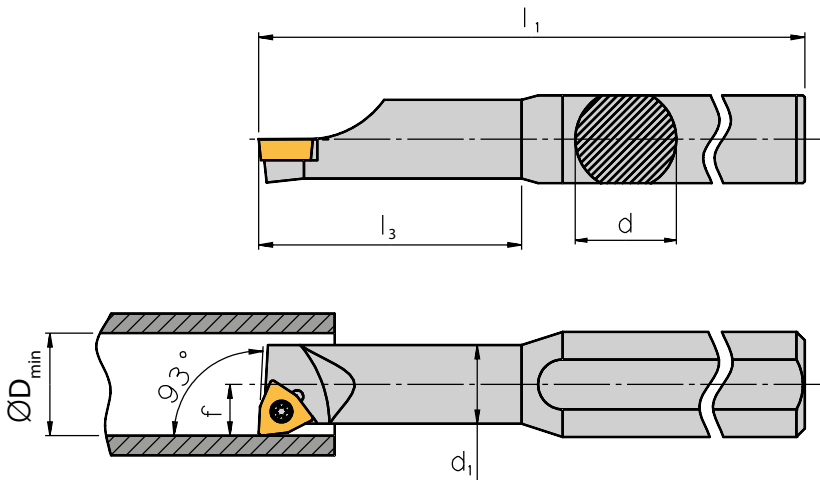
| Designation<br>Articolo<br>Article | d | l <sub>1</sub> | f   | D <sub>min</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|---|----------------|-----|------------------|----------------------------|
| E05F SWUCL/R 02                    | 5 | 85             | 2,9 | 5,8              | WC.. 0201...               |
| E06G SWUCL/R 02                    | 6 | 95             | 3,9 | 7,8              | WC.. 0201...               |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SWUC L/R 02                    | T2.03                | KS 1886              |

**SWUC L/R**

Approach angle 93° / Angolo di attacco 93° / Angle d'attaque 93°  
With screw clamping / Con bloccaggio a vite / Avec serrage par vis



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

2

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank / Barenì - Con stelo ridotto / Barres d'alésage - Avec corps en acier décalée

| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| S0508H SWUCL/R 02                  | 8 | 5 | 100            | 18             | 2,9 | 5,8              | WC.. 0201...                |
| S0608H SWUCL/R 02                  | 8 | 6 | 100            | 24             | 3,9 | 7,8              | WC.. 0201...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed steel shank and through tool coolant supply / Barenì - Con stelo ridotto e adduzione del refrigerante interna / Barres d'alésage - Avec corps en acier décalée et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| A0508H SWUCL/R 02                  | 8 | 5 | 100            | 18             | 2,9 | 5,8              | WC.. 0201...                |
| A0608H SWUCL/R 02                  | 8 | 6 | 100            | 24             | 3,9 | 7,8              | WC.. 0201...                |

**Holders / Utensili / Porte-outils**

Boring bars - With recessed Solid carbide shank and through tool coolant supply / Barenì - Con stelo ridotto in metallo duro e adduzione del refrigerante interna / Barres d'alésage - Avec corps en carbure monobloc décalée et alimentation interne en fluide de refroidissement

| Designation<br>Articolo<br>Article | d | D | l <sub>1</sub> | l <sub>2</sub> | f   | D <sub>min</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|---|----------------|----------------|-----|------------------|-----------------------------|
| E0508H SWUCL/R 02                  | 8 | 5 | 100            | 24             | 2,9 | 5,8              | WC.. 0201...                |
| E0608H SWUCL/R 02                  | 8 | 6 | 100            | 32             | 3,9 | 7,8              | WC.. 0201...                |

**Spare Parts / Ricambi / Pièces de rechange**

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| .. SWUC L/R 02                    | T2.03                | KS 1886              |

## Torque Screwdriver Sets

Set chiavi dinamometriche

Set de tournevis dynamométriques



### Set 1

Adjustable from 0,6 Nm – 1,5 Nm

Registrabile da 0,6 Nm a 1,5 Nm

Plage de réglage de 0,6 Nm – 1,5 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T6, Torx T7, Torx T8 and Torx T9
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T6, Torx T7, Torx T8, Torx T9
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique avec embout Torx T6, Torx T7, Torx T8 et Torx T9
- 1 Clé de réglage

(Order as: **Set-Drehmoment 1**)

(Esempio di ordinazione: **Set-Drehmoment 1**)

(Référence de commande : **Set-Drehmoment 1**)

### Set 2

Adjustable from 1,5 Nm – 3,0 Nm

Registrabile da 1,5 Nm a 3,0 Nm

Plage de réglage de 1,5 Nm – 3,0 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T9, Torx T10 and Torx T15
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T9, Torx T10, Torx T15
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique avec embout Torx T9, Torx T10 et Torx T15
- 1 Clé de réglage

(Order as: **Set-Drehmoment 2**)

(Esempio di ordinazione: **Set-Drehmoment 2**)

(Référence de commande : **Set-Drehmoment 2**)

### Set 3

Adjustable from 3,0 Nm – 5,4 Nm

Registrabile da 3,0 Nm a 5,4 Nm

Plage de réglage de 3,0 Nm – 5,4 Nm

- 1 Torque screwdriver
- 1/ea Bit Torx T10, Torx T15 and Torx T20
- 1 Adjustment key

- 1 Chiave dinamometrica
- 1 Set di punte Torx T10, Torx T15, Torx T20
- 1 Chiave di registrazione

- 1 Tournevis dynamométrique avec embout Torx T10, Torx T15 et Torx T20
- 1 Clé de réglage

(Order as: **Set-Drehmoment 3**)

(Esempio di ordinazione: **Set-Drehmoment 3**)

(Référence de commande : **Set-Drehmoment 3**)

## Recommended torque settings for indexable inserts

Momenti torcenti raccomandati per viti

Couples de serrage recommandés pour vis de plaquette

| Thread<br>Filetto vite<br>Filetage | Torx size<br>Dimensione Torx<br>Dimension | max. torque<br>Momento torcente<br>Couple de serrage max. |
|------------------------------------|---|---|
| M1,8                               | T6  | 0,6 Nm  |
| M2                                 | T6  | 0,6 Nm  |
| M2                                 | T7  | 0,6 Nm  |
| M2,2                               | T6  | 1,0 Nm  |
| M2,2                               | T7  | 1,0 Nm  |
| M2,2                               | T8  | 1,3 Nm  |
| M3                                 | T8  | 2,2 Nm  |
| M3                                 | T9  | 2,2 Nm  |
| M3,5                               | T15                                       | 3,4 Nm  |
| M4                                 | T15                                       | 5,1 Nm  |
| M4,5                               | T20                                       | 6,2 Nm  |
| M5                                 | T20                                       | 6,2 Nm  |
| M6                                 | T25                                       | 8,1 Nm  |

## HSK-T

- System presentation
- Tool holders
- Application notes

## HSK-T

- *Presentazione del sistema*
- *Utensili*
- *Suggerimenti tecnici*

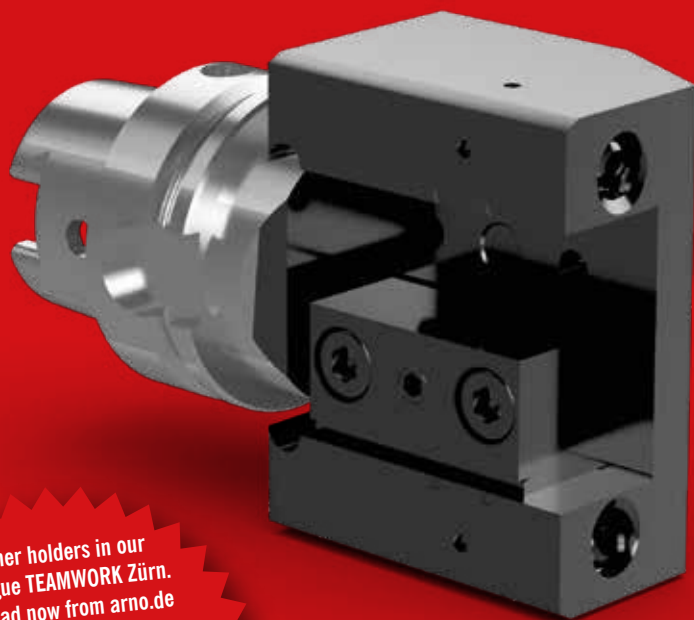
## HSK-T

- Présentation du système
- Support de serrage
- Consignes d'utilisation

170 – 187

188 – 219

220 – 222



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# 3

# PRECISION ON THE FLY.

**Tool changes with speed, precision and flexibility: HSK-T tool holders from ARNO.**

With HSK-T, you benefit from the advantages of the HSK interface for turning applications on multi-task turn-milling centres, such as fast automatic tool changes, stability and rigidity. And thanks to the tight tolerances of the driving slot, you can rely on precise radial positioning on the T variant (T for turning). This means you quickly obtain highly accurate tool tip height positioning when tools are changed.

Besides HSK-T holders for outside and inside taper complying with ISO 12164-3/4, ARNO has a wide selection of special holders for your STAMA machining centres.



## PRECISE BENEFITS

of HSK-T tool holders from ARNO

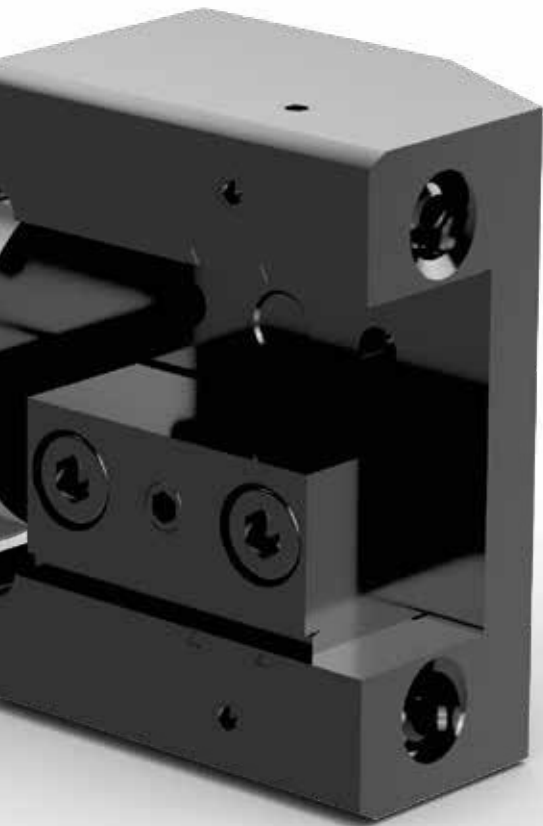
Repeatable precision – exact top height thanks to tight driving slot tolerances

Fast – minimum set-up and tool change times

Stable – robust, rigid design

### Quality and flexibility

- Alloy case-hardened steel with a core tensile strength of min. 800 N/mm<sup>2</sup>
- Burnished and precision-ground
- All HSK-T tools comply with dimensions d1 and l2 of ISO 12164-1 (HSK-A) – this also permits automatic changes on machines designed for HSK-A tools



### Diversity

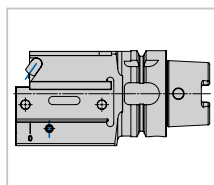
- HSK-T holders for negative and positive indexable inserts
- HSK-T boring bars for negative and positive indexable inserts

Further holders  
in our catalogue  
**TEAMWORK ZÜRICH**  
Download now  
from [arno.de](http://arno.de)



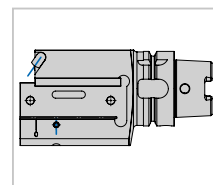
# TOOL HOLDERS

## HSK-T for tool holders with square shank



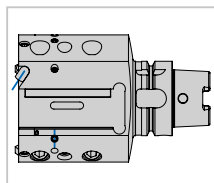
**HSK-T63-ASHR-30110-20-IK**

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**HSK-T63-ASHR-38130-25-IK**

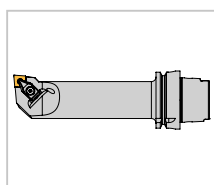
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**HSK-T63-ASHR-44145-25**

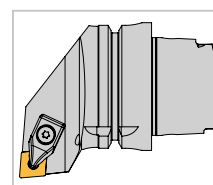
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## HSK-T turning heads for negative indexable inserts



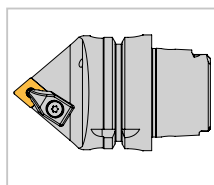
**HSK-T63-DCLNL-27180-12**

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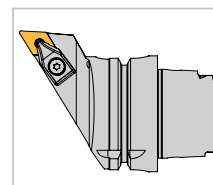
**HSK-T63-DCLNL/R-45065-12**

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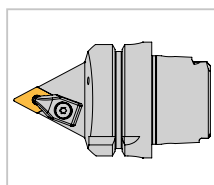
**HSK-T63-DCMNN-0075-12**

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**HSK-T63-DDJNL-45075-15**

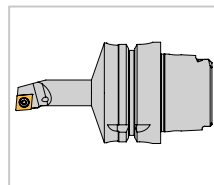
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**HSK-T63-DDNNN-0075-15**

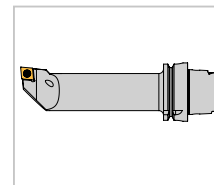
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HSK-T turning heads for positive indexable inserts



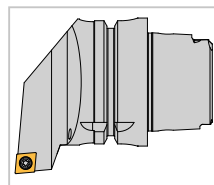
**HSK-T63-SCLCR  
11090-09**

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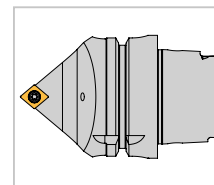
**HSK-T63-SCLCL  
27180-12**

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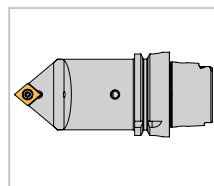
**HSK-T63-SCLCL/R  
45065-09**

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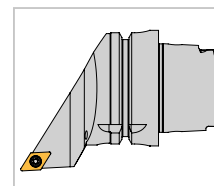
**HSK-T63-SCMCN  
0070-09**

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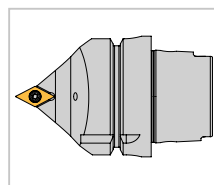
**HSK-T63-SCMCN  
00115-12**

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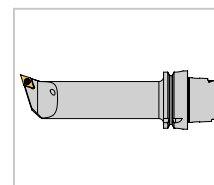
**HSK-T63-SDJCL/R  
45075-11**

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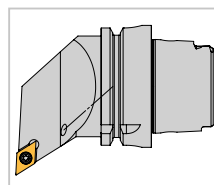
**HSK-T63-SDNCN  
0070-11**

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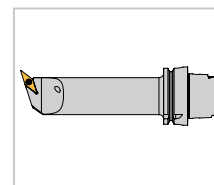
**HSK-T63-SDQCL  
27180-11**

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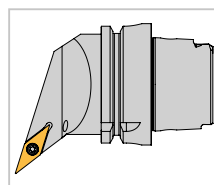
**HSK-T63-SDUCL/R  
45070-11**

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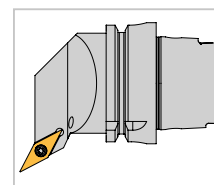
**HSK-T63-SVQCL  
27180-16**

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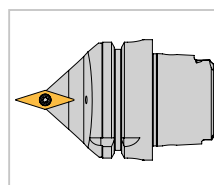
**HSK-T63-SVQCL/R  
45070-16**

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**HSK-T63-SV117,5CL/R  
45070-16**

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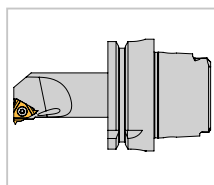


**HSK-T63-SVVCN  
0070-16**

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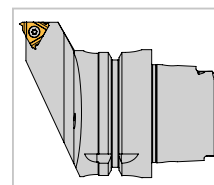
# TOOL HOLDERS

## HSK-T for threading



**HSK-T63-AVR  
16-3R**

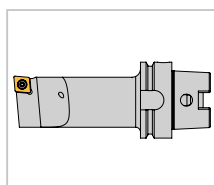
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**HSK-T63-SEL  
45065-16**

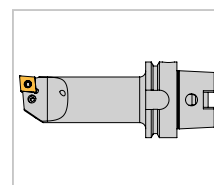
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## HSK-T for Stama machines



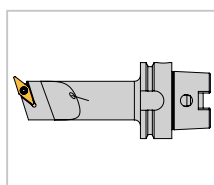
**ST-SCLCL 12-T**

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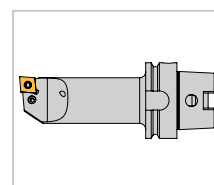
**ST-SDUCL 11-T**

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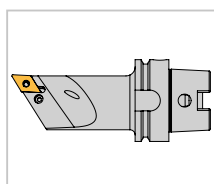
**ST-SVQCL 16-T**

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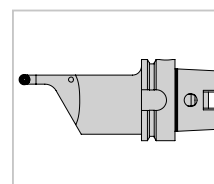
**ST-PCLNL 12-T**

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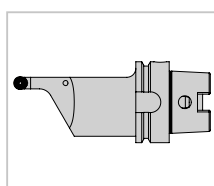
**ST-PDUNL 15-T**

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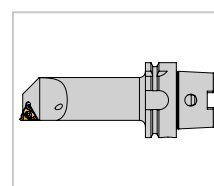
**ST-SRDCL 08-T**

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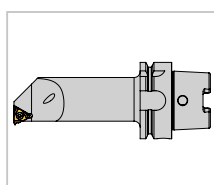
**ST-SRDCL 10-T**

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**ST-AL16L/R-T  
Threading**

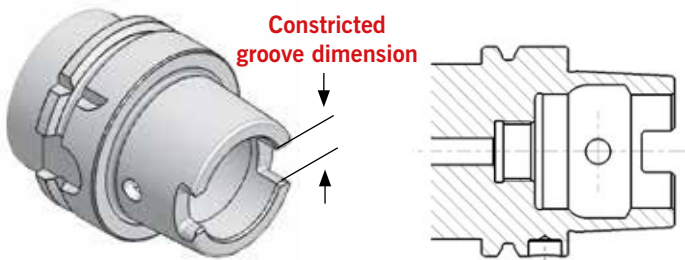
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**ST-NVR16R-T  
Threading**

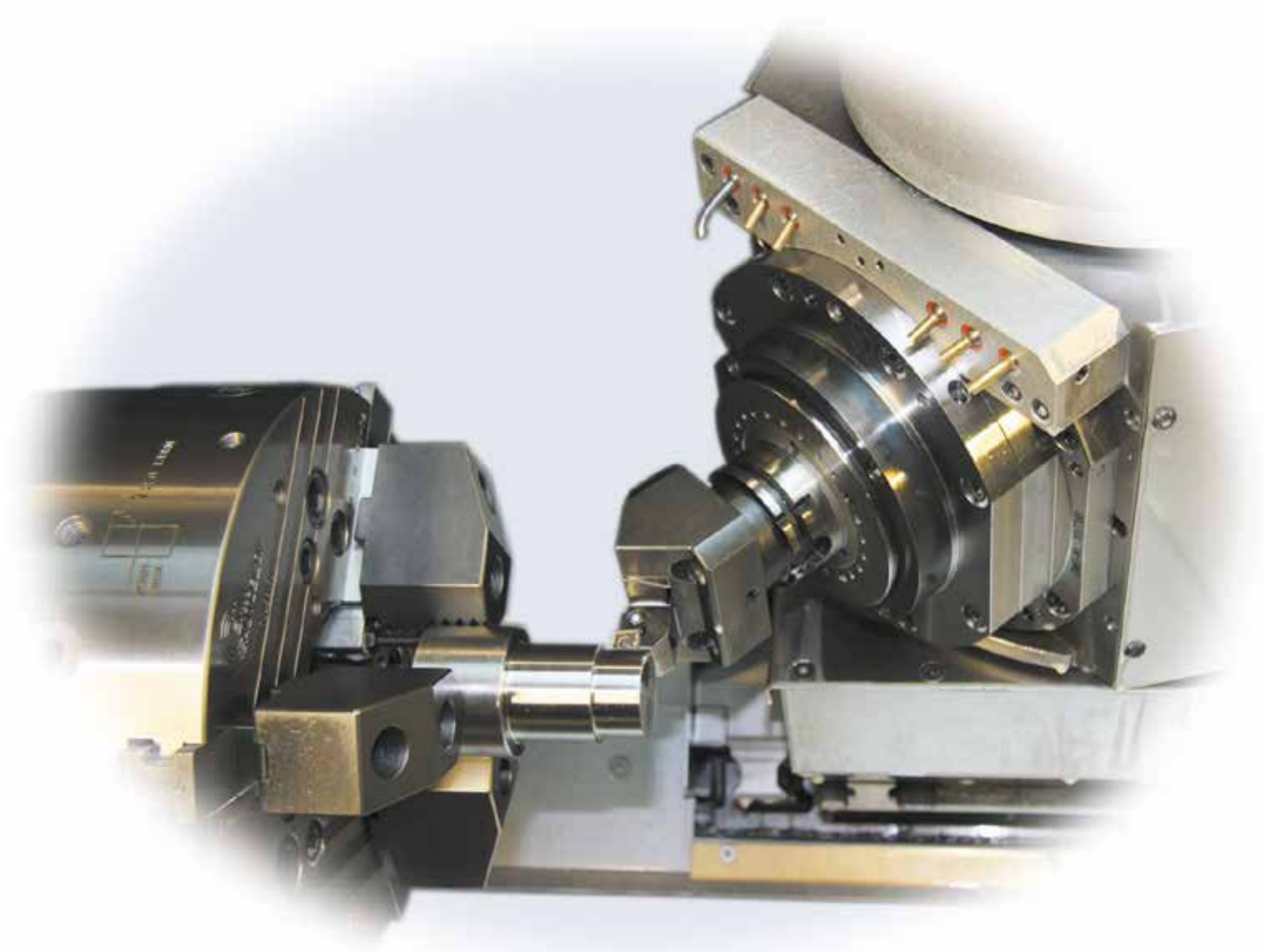
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## HSK - T



### Preferred design for Multi-task turn-milling centres

- Automatic tool change
- Driving slots at cone end
- Central coolant supply through the automatic clamping part by means of coolant tubes



# PRECISIONE E RAPIDITÀ.

**Per ritmo, precisione e flessibilità nel cambio utensile: portautensili HSK-T di ARNO.**

Con HSK-T, potrà avvalersi dei vantaggi dell'interfaccia HSK, come il cambio utensile automatico veloce, la stabilità e la rigidità per applicazioni di tornitura su centri di tornitura/fresatura multi-tasking. E grazie alle tolleranze particolarmente ristrette della scanalatura di trascinamento, per la variante a T (T per la tornitura) può contare anche sulla precisione di posizionamento radiale. Ciò consente di raggiungere facilmente e in modo sicuro - durante il cambio utensile - un'elevata precisione nell'altezza delle punte.

Oltre agli adattatori conici HSK-T per interni ed esterni, realizzati ai sensi della norma ISO 12164-3/4, da ARNO troverà una grande scelta di adattatori specifici per il Suoi centri di lavorazione STAMA.



## VANTAGGI PRECISI

dei portautensili HSK-T di ARNO.

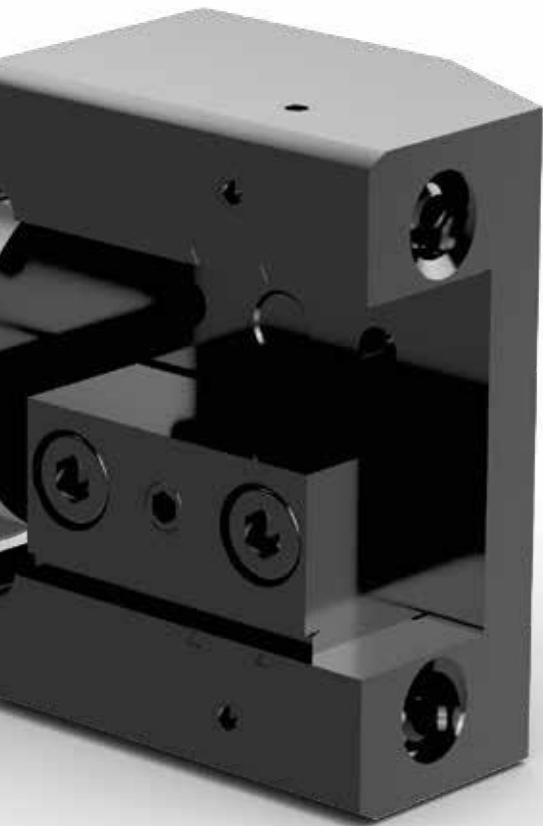
Dotati di notevole accuratezza - altezza delle punte esatta grazie alle ridotte tolleranze della scanalatura di trascinamento

Rapidi - tempi di allestimento e di cambio utensile minimi

Stabili - progettazione robusta, rigida

### Qualità e flessibilità

- Acciaio legato con una resistenza alla trazione nel nocciolo di min. 800 N/mm<sup>2</sup>
- Brunito e rettificato di precisione
- Tutti gli utensili HSK-T nelle misure d1 e l2 sono conformi alla norma ISO 12164-1 (HSK-A) - grazie a ciò il cambio automatico è possibile anche per le macchine progettate per gli utensili HSK-A



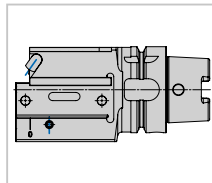
### Versatilità

- Utensili HSK-T per inserti negativi e positivi
- Barenì HSK-T per inserti negativi e positivi

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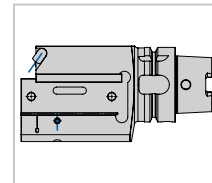
# ADATTATORE

## HSK-T adattatore per utensili con stelo quadro



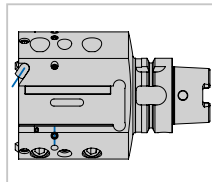
**HSK-T63-ASHR-30110-20-IK**

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**HSK-T63-ASHR-38130-25-IK**

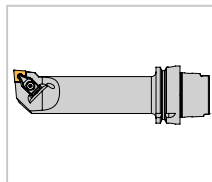
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**HSK-T63-ASHR-44145-25**

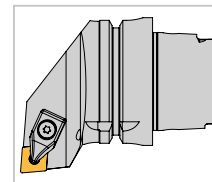
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## Testine HSK-T per inserti negativi



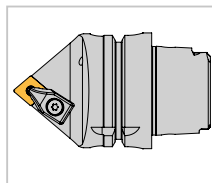
**HSK-T63-DCLNL 27180-12**

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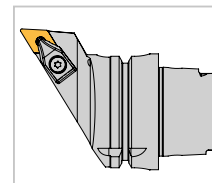
**HSK-T63-DCLNL/R 45065-12**

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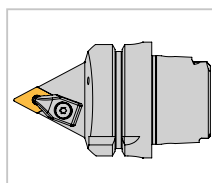
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**HSK-T63-DDJNL 45075-15**

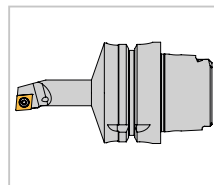
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**HSK-T63-DDNNN 0075-15**

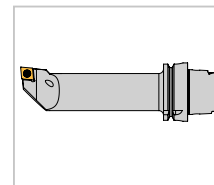
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Testine HSK-T per inserti  
positivi



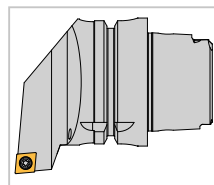
**HSK-T63-SCLCR  
11090-09**

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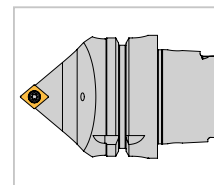
**HSK-T63-SCLCL  
27180-12**

Pagina 198



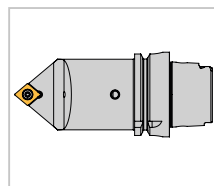
**HSK-T63-SCLCL/R  
45065-09**

Pagina 199



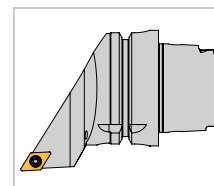
**HSK-T63-SCMCN  
0070-09**

Pagina 201



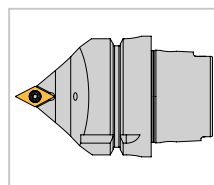
**HSK-T63-SCMCN  
00115-12**

Pagina 202



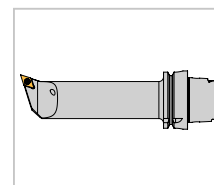
**HSK-T63-SDJCL/R  
45075-11**

Pagina 203



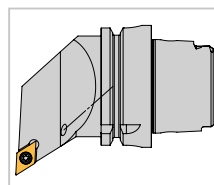
**HSK-T63-SDNCN  
0070-11**

Pagina 204



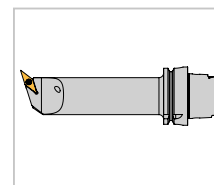
**HSK-T63-SDQCL  
27180-11**

Pagina 205



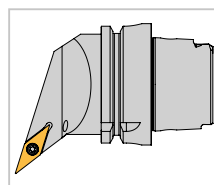
**HSK-T63-SDUCL/R  
45070-11**

Pagina 206



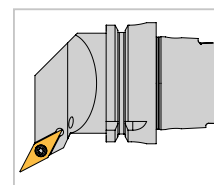
**HSK-T63-SVQCL  
27180-16**

Pagina 209



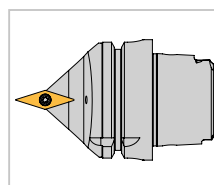
**HSK-T63-SVQCL/R  
45070-16**

Pagina 210



**HSK-T63-  
SV117,5CL/R  
45070-16**

Pagina 212



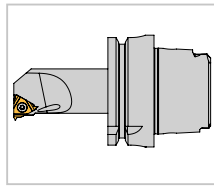
**HSK-T63-SVVCN  
0070-16**

Pagina 213



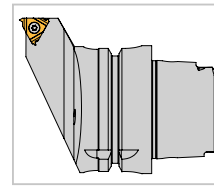
# ADATTATORE

## HSK-T per filettatura



**HSK-T63-AVR  
16-3R**

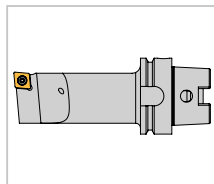
Pagina 191



**HSK-T63-SEL  
45065-16**

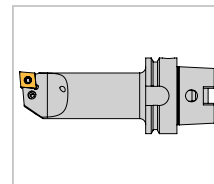
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## HSK-T per macchine Stama



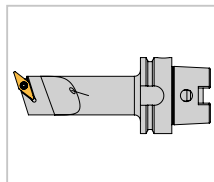
**ST-SCLCL 12-T**

Pagina 200



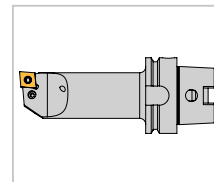
**ST-SDUCL 11-T**

Pagina 207



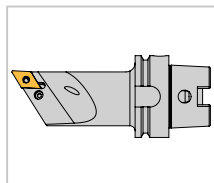
**ST-SVQCL 16-T**

Pagina 211



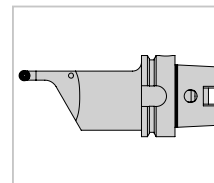
**ST-PCLNL 12-T**

Pagina 216



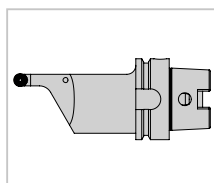
**ST-PDUNL 15-T**

Pagina 217



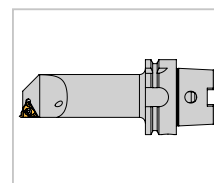
**ST-SRDCL 08-T**

Pagina 218



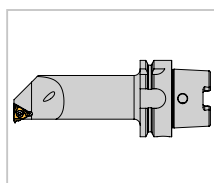
**ST-SRDCL 10-T**

Pagina 219



**ST-AL16L/R-T  
Threading**

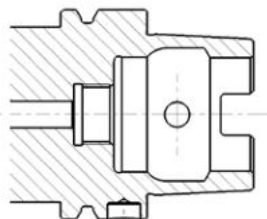
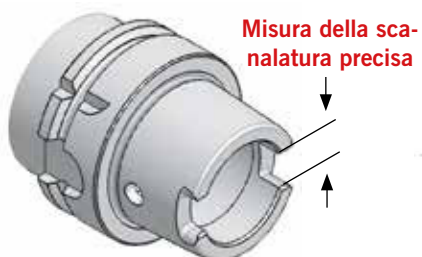
Pagina 214



**ST-NVR16R-T  
Threading**

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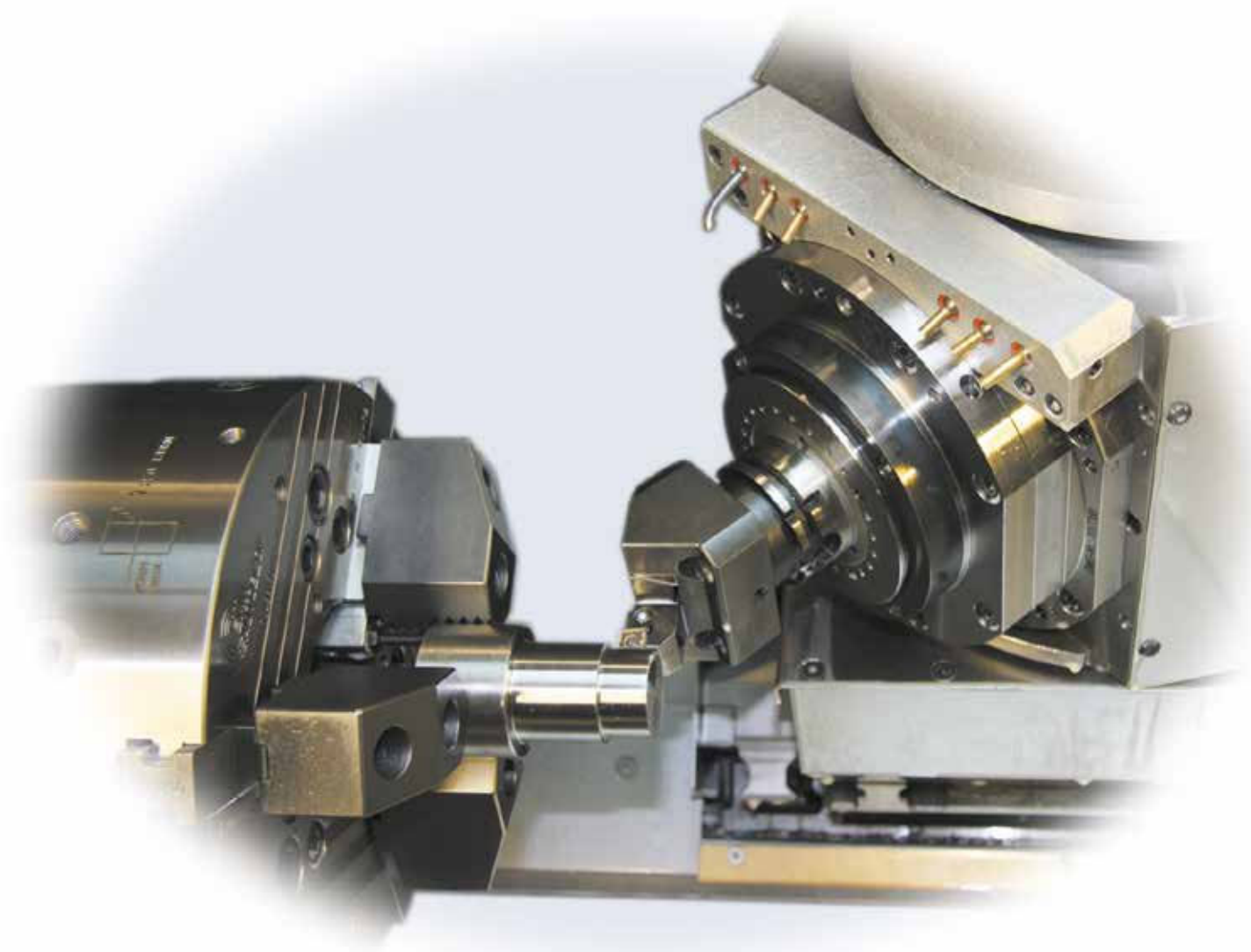
## HSK - T



### Esecuzione preferita per centri di tornitura e fresatura Multi-Tasking

- Cambio utensile automatico
- scanalature di trascinamento all'estremità del cono
- Adduzione del liquido di raffreddamento centrale mediante il dispositivo di serraggio automatico tramite tubo del refrigerante

3



# PRÉCISION ET RAPIDITÉ.

**Pour de la cadence, de la précision et de la flexibilité lors du changement d'outils : supports d'outils HSK-T d'ARNO.**

Avec HSK-T, vous profitez dans les applications de tournage sur des centres de tournage/ fraissage multi tâches des avantages de l'interface HSK, tels que les changements d'outils rapides et automatisés, de la stabilité et de la rigidité. Et grâce à des tolérances particulièrement étroites de la rainure d'entraînement, vous pouvez également vous fier à la précision de positionnement radial avec la variante T (T pour turning). Ainsi, lors des changements d'outils, vous atteignez facilement et en toute sécurité une précision élevée de la hauteur de pointe.

Outre les supports HSK-T normalisés selon ISO 12164-3/4 pour cônes externes et internes, vous trouverez chez ARNO un grand choix de supports spéciaux pour vos centres d'usinage STAMA.



## LES AVANTAGES PRÉCISION

des supports d'outils HSK-T d'ARNO

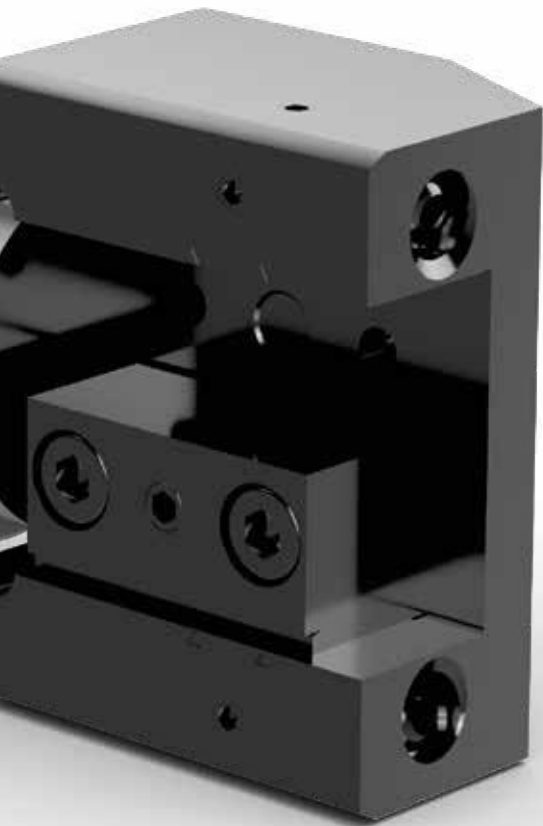
Précision de répétition – hauteur de pointe exacte  
grâce à des tolérances étroites de la rainure d'en-  
traînement

Rapidité – temps de préparation et de changement  
d'outils réduits

Stabilité – construction robuste et rigide

## Qualité et flexibilité

- Acier cémenté allié avec une résistance à la traction au centre de min. 800 N/mm<sup>2</sup>
- Brunis et rectifiés avec précision
- Tous les outils HSK-T sont conformes à la norme ISO 12164-1 (HSK-A) en ce qui concerne les dimensions d1 et l2, permettant ainsi le changement automatique sur les machines conçues pour les outils HSK-A



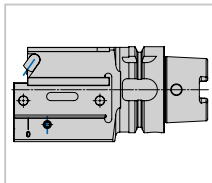
## Diversité

- Supports HSK-T pour plaquettes de coupe amovibles négatives et positives
- Barres d'alésage HSK-T pour plaquettes de coupe amovibles négatives et positives

**D'autres supports  
dans notre catalogue  
TEAMWORK Zürrn !  
Télécharger maintenant  
sur arno.de**

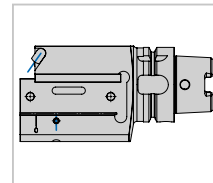
# SUPPORT DE SERRAGE

HSK-T pour porte-outils avec tige à 4 bords



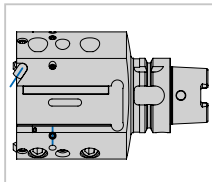
**HSK-T63-ASHR-30110-20-IK**

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**HSK-T63-ASHR-38130-25-IK**

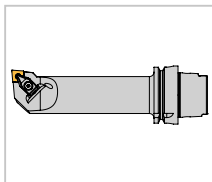
Page 189



**HSK-T63-ASHR-44145-25**

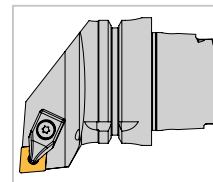
Page 190

Têtes de tournage HSK-T pour plaquettes de coupe amovibles négatives



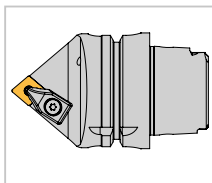
**HSK-T63-DCLNL 27180-12**

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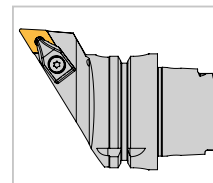
**HSK-T63-DCLNL/R 45065-12**

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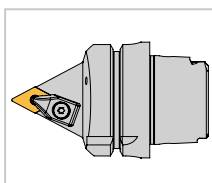
**HSK-T63-DCMNN 0075-12**

Page 194



**HSK-T63-DDJNL 45075-15**

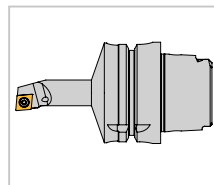
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**HSK-T63-DDNNN 0075-15**

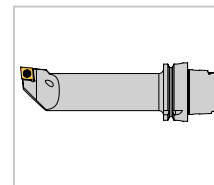
Page 196

Têtes de tournage HSK-T pour  
plaquettes de coupe amovibles  
positives



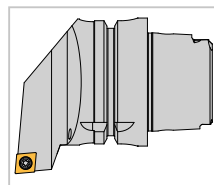
**HSK-T63-SCLCR  
11090-09**

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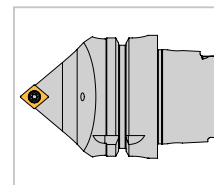
**HSK-T63-SCLCL  
27180-12**

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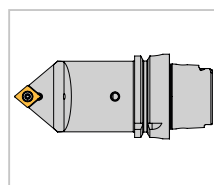
**HSK-T63-SCLCL/R  
45065-09**

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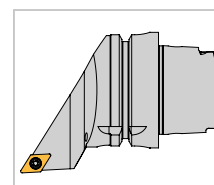
**HSK-T63-SCMCN  
0070-09**

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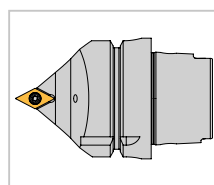
**HSK-T63-SCMCN  
00115-12**

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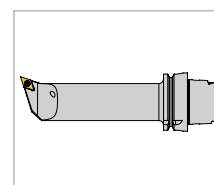
**HSK-T63-SDJCL/R  
45075-11**

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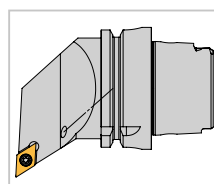
**HSK-T63-SDNCN  
0070-11**

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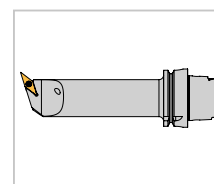
**HSK-T63-SDQCL  
27180-11**

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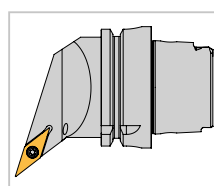
**HSK-T63-SDUCL/R  
45070-11**

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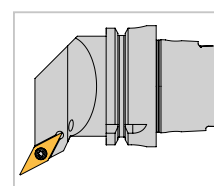
**HSK-T63-SVQCL  
27180-16**

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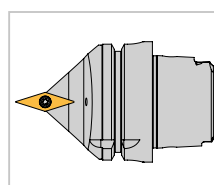
**HSK-T63-SVQCL/R  
45070-16**

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**HSK-T63-  
SV117,5CL/R  
45070-16**

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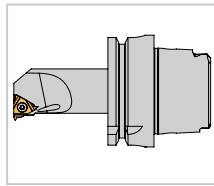


**HSK-T63-SVVCN  
0070-16**

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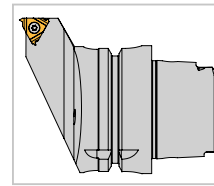
# SUPPORT DE SERRAGE

## HSK-T pour filetage



**HSK-T63-AVR  
16-3R**

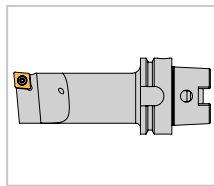
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**HSK-T63-SEL  
45065-16**

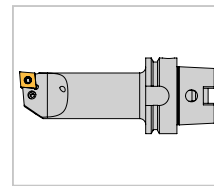
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## HSK-T pour machines Stama



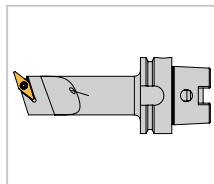
**ST-SCLCL 12-T**

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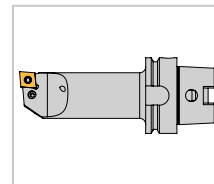
**ST-SDUCL 11-T**

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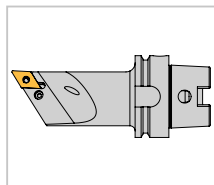
**ST-SVQCL 16-T**

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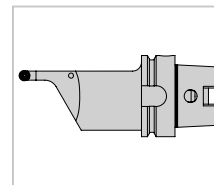
**ST-PCLNL 12-T**

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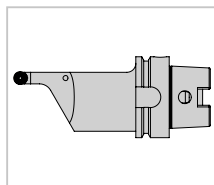
**ST-PDUNL 15-T**

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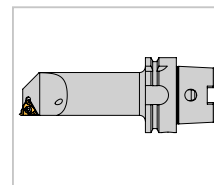
**ST-SRDCL 08-T**

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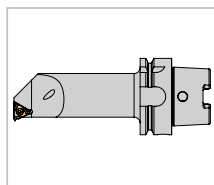
**ST-SRDCL 10-T**

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**ST-AL16L/R-T  
Threading**

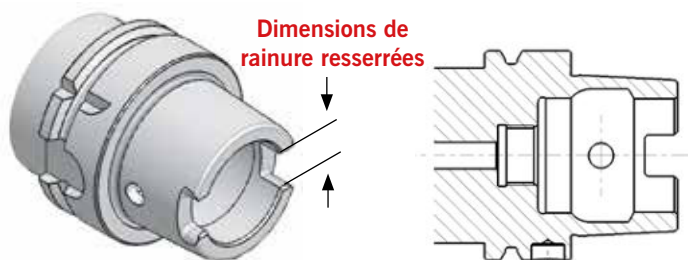
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**ST-NVR16R-T  
Threading**

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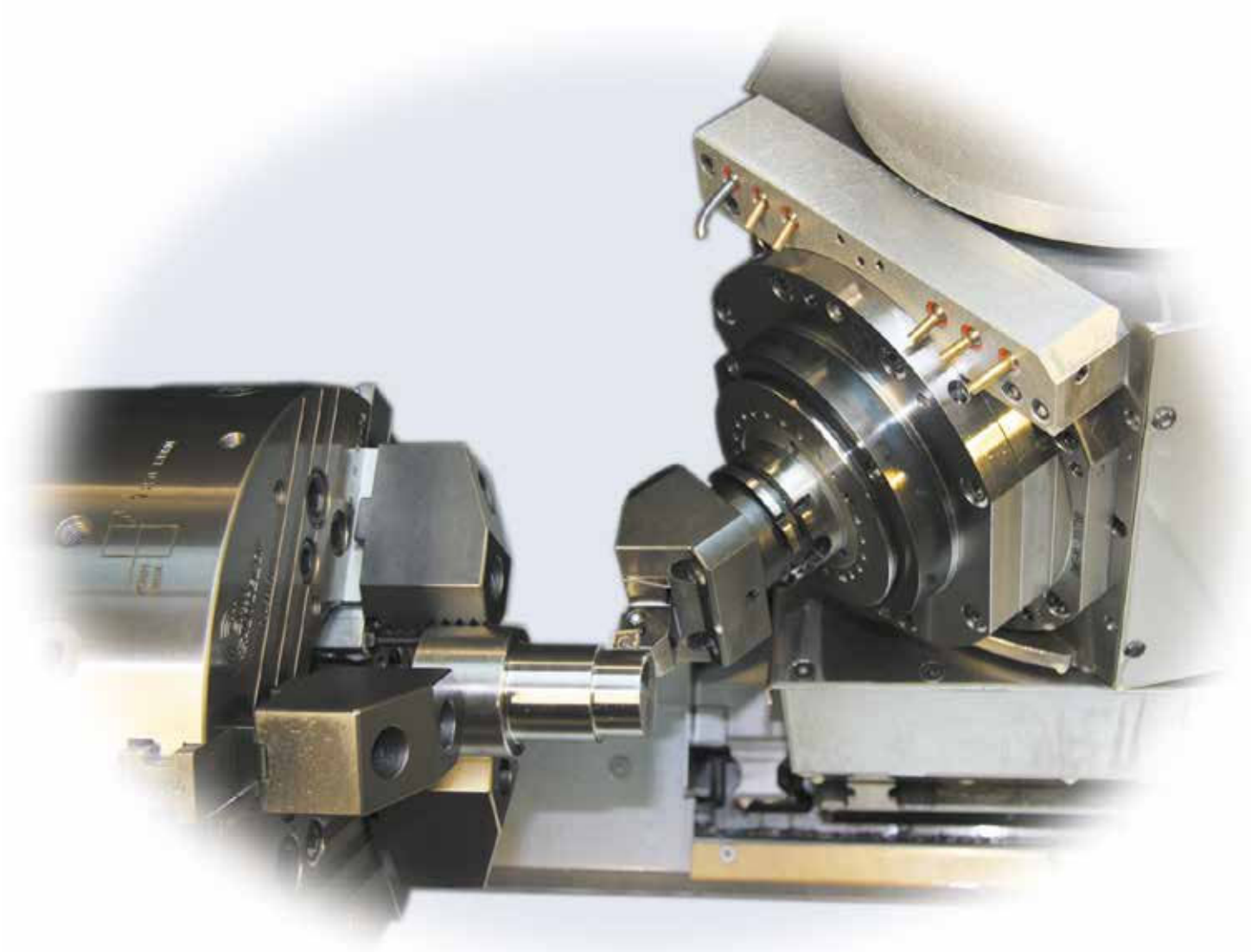
## HSK - T



### Modèle privilégié pour les centres de tournage/fraisage multi tâches

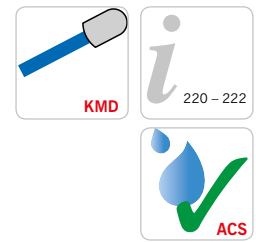
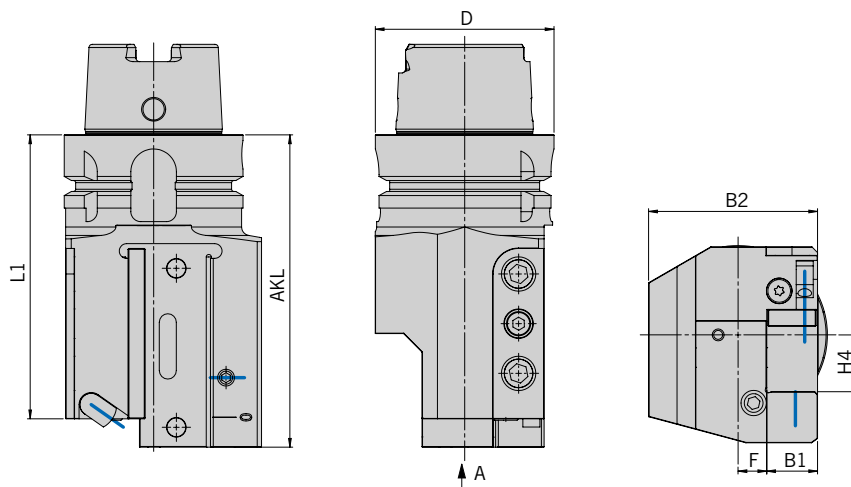
- Changement automatique des outils
- Rainures d'entraînement à l'extrémité du cône
- Arrivée de liquide de refroidissement centrale via le dispositif de serrage automatique à l'aide du tuyau de liquide de refroidissement

3





## ASH R ...-IK



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | B1 | B2   | H4 | L1  | F  |
|------------------------------------|-----|----|----|------|----|-----|----|
| HSK-T63-ASHR-30110-20-IK           | 110 | 63 | 18 | 59,5 | 20 | 100 | 10 |

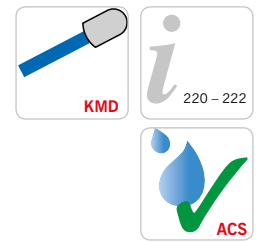
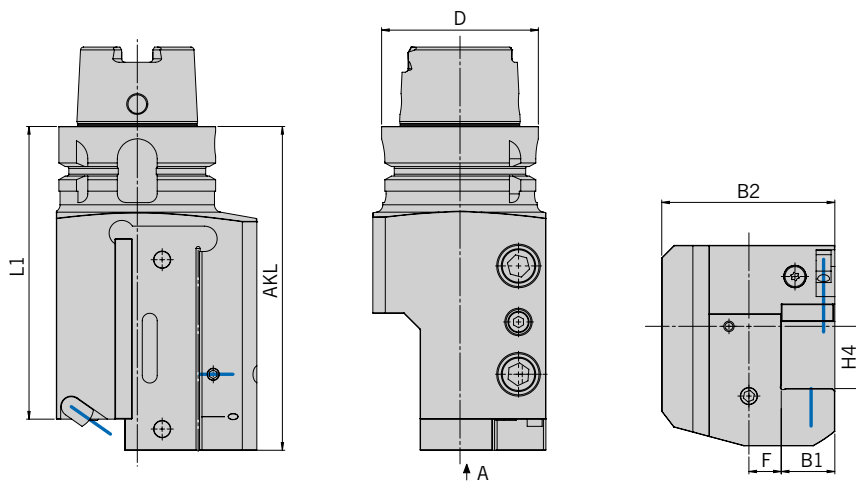
 ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. È possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## ASH R ...IK



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### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | B1   | B2   | H4 | L1    | F  |
|------------------------------------|-----|----|------|------|----|-------|----|
| HSK-T63-ASHR-38130-25-IK           | 130 | 63 | 21,5 | 69,5 | 25 | 117,5 | 13 |

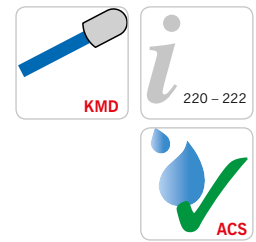
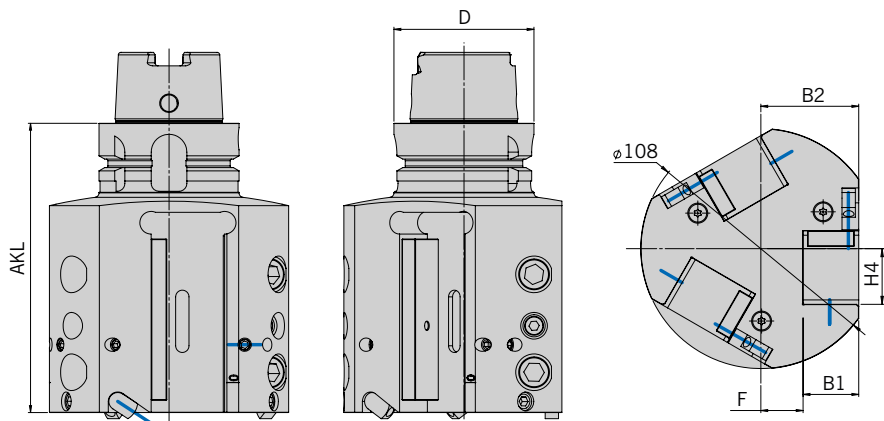
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## ASH R ...-IK



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | B1 | B2 | H4 | F  |
|------------------------------------|-----|----|----|----|----|----|
| HSK-T63-ASHR 44145-25              | 130 | 63 | 25 | 44 | 25 | 19 |

 ARNO® SpecialDesign

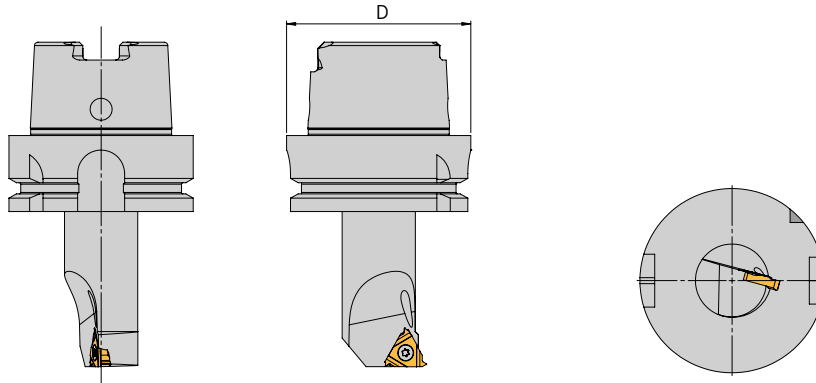
Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. E' possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## AVR L/R

Thread turning / Filettatura / Filetage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | NL | F    | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----|------|-----------------------------|
| HSK-T63-AVR 16-3R                  | 79  | 63 | 30               | 53 | 16,4 | 16I...                      |

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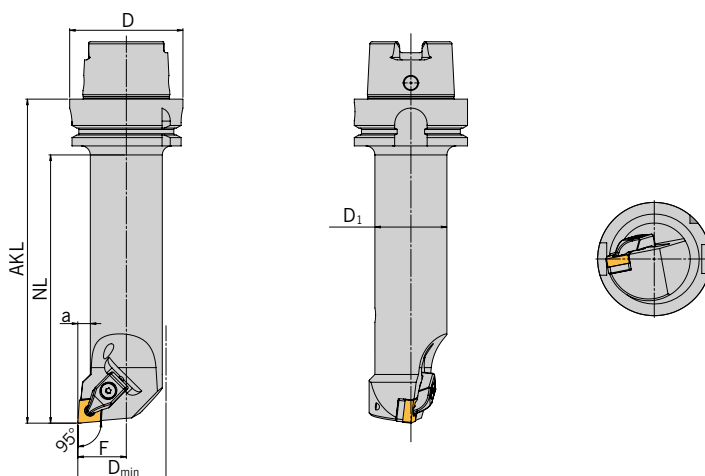
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## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Screw for washer<br>Vite per supporto<br>Vis pour support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|---|----------------------|
| HSK-T63-AVR 16-3R                 | SA3T                 | YE3                                     | SY3T  | KS 2510              |

## DCLN L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | a | NL  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|---|-----|----|-----------------------------|
| HSK-T63-DCLNL 27180-12             | 180 | 63 | 49               | 40             | 7 | 149 | 27 | CN.. 1204...                |

### ARNO® SpecialDesign

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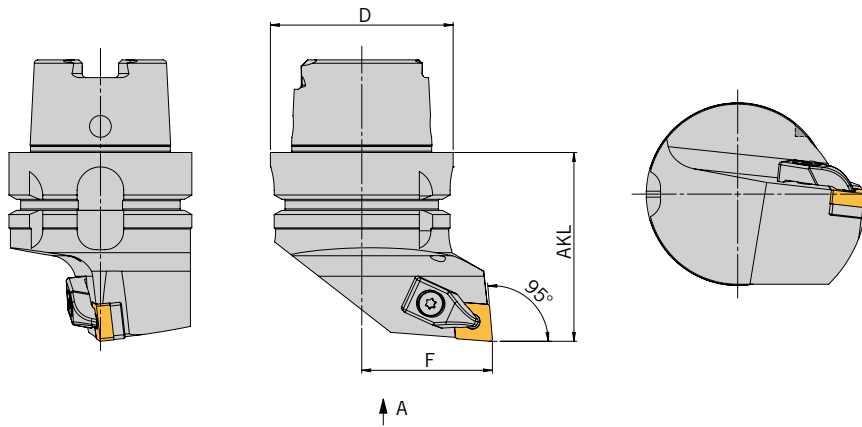
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|--|----------------------|
| HSK-T63-DCLNL 27180-12            | M4,5X10-T15          | U-CN12T3-D                              | KD2201   | KS 1111              |

## DCLN L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| HSK-T63-DCLNL/R 45065-12           | 65  | 63 | 45 | CN.. 1204...                |

## ARNO® SpecialDesign

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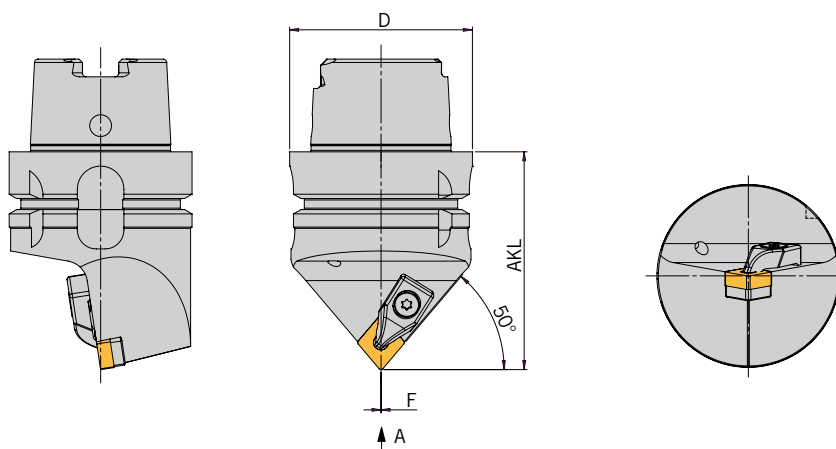
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## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|--|----------------------|
| HSK-T63-DCLNL/R 45065-12          | M4,5X10-T15          | U-CN12T3-D                              | KD2201   | KS 1111              |

## DCMNN

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|-----------------------------|
| HSK-T63-DCMNN 0075-12              | 75  | 63 | CN.. 1204...                |

### ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

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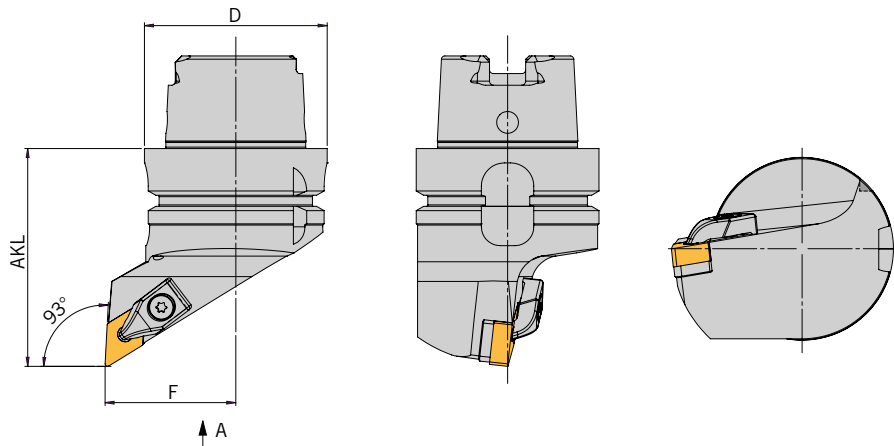
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|--|----------------------|
| HSK-T63-DCMNN 0075-12             | M4,5X10-T15          | U-CN12T3-D                              | KD2201   | KS 1111              |

## DDJN L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| HSK-T63-DDJNL 45075-15             | 75  | 63 | 45 | DN.. 1506...                |

### ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. E' possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

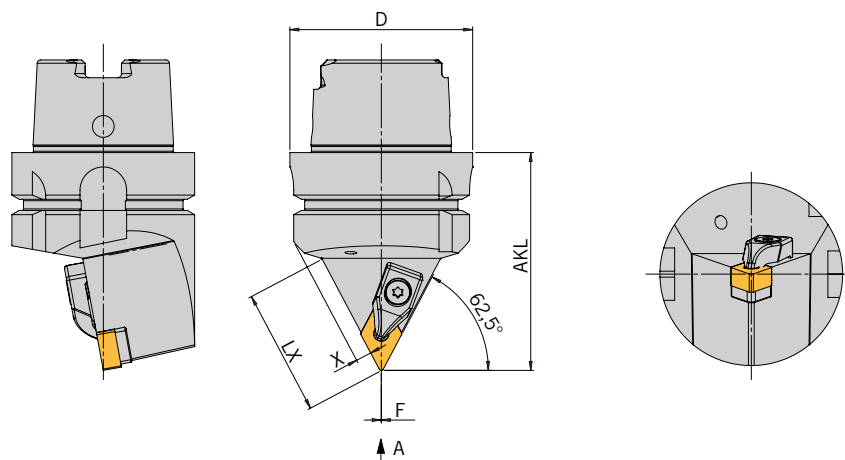
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|--|----------------------|
| HSK-T63-DDJNL 45075-15            | M4,5X10-T15          | U-DN15T3-D                              | KD2201   | KS 1111              |



## DDNNN

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | LX | X   | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|----|-----|----------------------------|
| HSK-T63-DDNNN 0075-15              | 75  | 63 | 43 | 5,5 | DN.. 1506...               |

### ARNO® SpecialDesign

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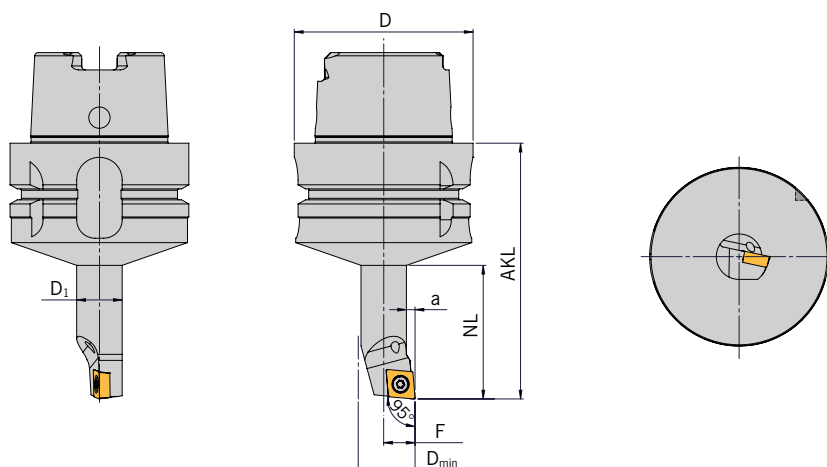
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Clamp/spring/screw<br>Staffa/molla/vite<br>Pince/ressort/vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|--|----------------------|
| HSK-T63-DDNNN 0075-15             | M4,5X10-T15          | U-DN15T3-D                              | KD2201   | KS 1111              |

## SCLC R

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | a | NL | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|---|----|----|-----------------------------|
| HSK-T63-SCLCR 11090-09             | 90  | 63 | 20               | 16             | 3 | 47 | 11 | CC..09T3..                  |

### ARNO® SpecialDesign

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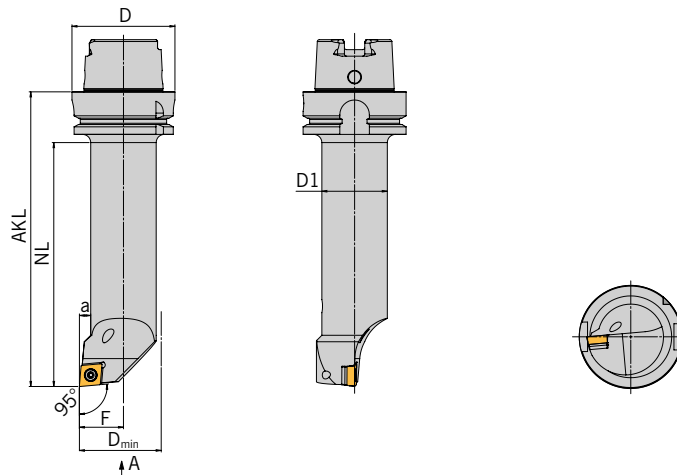
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SCLCR 11090-09            | SS 1221              | US 1221                                 | GBS 1221                   | KS 1115              |

## SCLC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | a | NL  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|---|-----|----|-----------------------------|
| HSK-T63-SCLCL 27180-12             | 180 | 63 | 49               | 40             | 7 | 149 | 27 | CC...1204...                |

### ARNO® SpecialDesign

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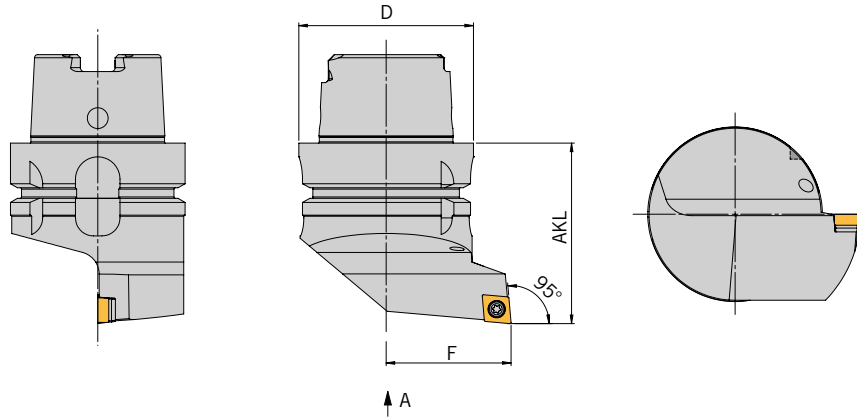
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SCLCL 27180 12            | SS 1221              | US 1221                                 | GBS 1221                   | KS 1115              |

## SCLC L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| HSK-T63-SCLCL/R 45065-09           | 65  | 63 | 45 | CC...09T3...                |

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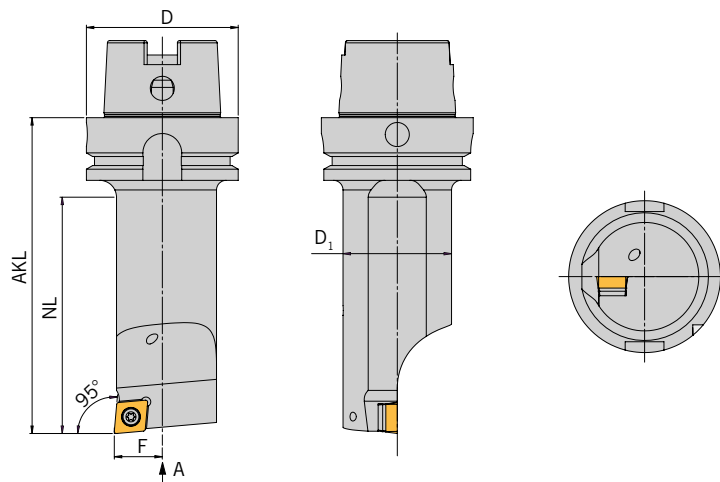
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SCLCL/R 45065-09          | SS 1111              | US 1111                                 | GBS 1111                   | KS 1115              |

## SCLC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | NL | F  | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|----------------|----|----|----------------------------|
| ST-SCLCL 12-T                      | 130 | 63 | 45             | 97 | 20 | CC.. 1204...               |

### ARNO® SpecialDesign

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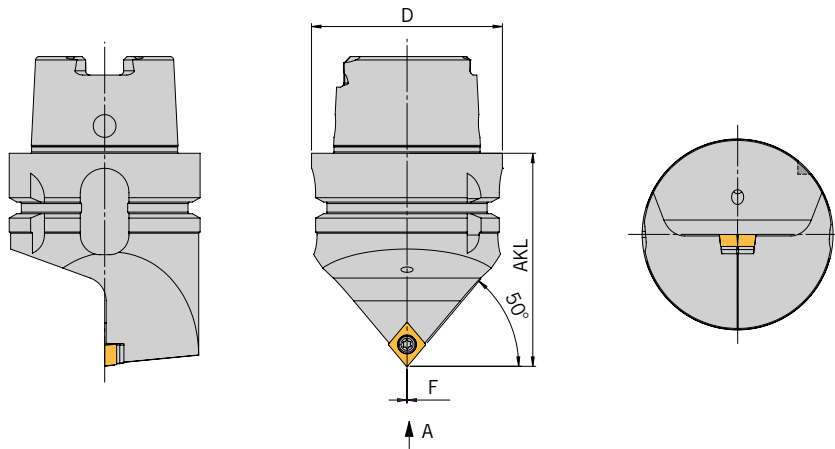
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| ST-SCLCL 12-T                     | SS 1221              | US 1221                                 | GBS 1221                   | KS 1115              |

## SCMC N

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|-----------------------------|
| HSK-T63-SCMCN 0070-09              | 70  | 63 | CC.. 09T3...                |

### ARNO® SpecialDesign

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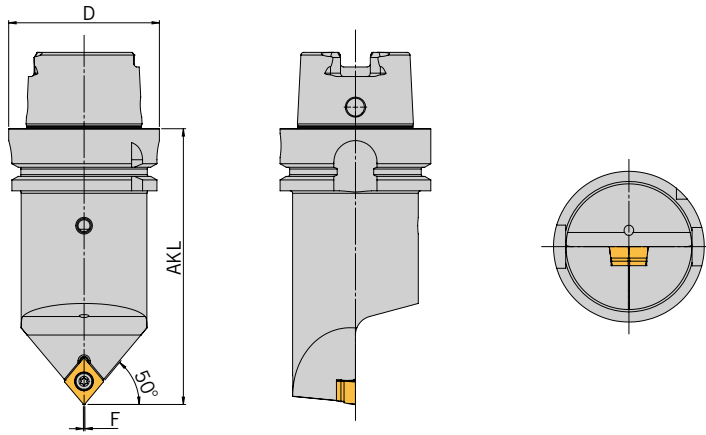
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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SCMCN 0070-09             | SS 1111              | US 1111                                 | GBS 1111                   | KS 1115              |

## SCMC N

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----------------|-----------------------------|
| HSK-T63-SCMCN 00115-12             | 115 | 63 | 52,5           | CC.. 1204...                |

### ARNO® SpecialDesign

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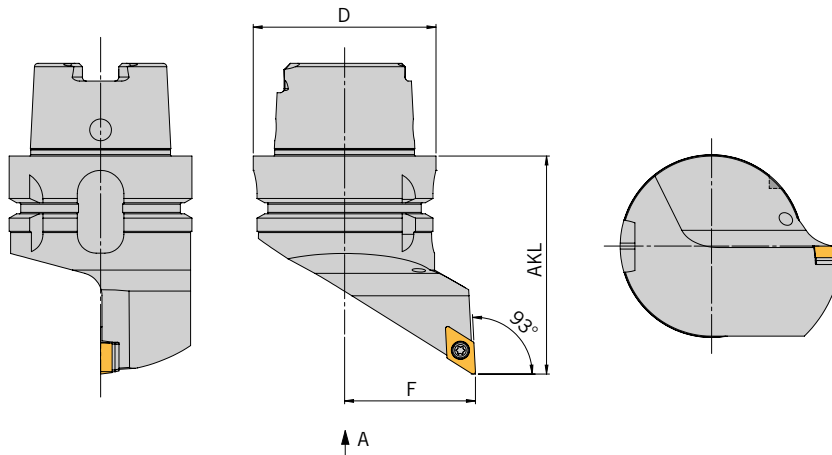
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SCMCN 00115-12            | SS 1221              | US 1221                                 | GBS 1221                   | KS 1115              |

## SDJC L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| HSK-T63-SDJCL/R 45075-11           | 75  | 63 | 45 | DC.. 11T3...                |

### ARNO® SpecialDesign

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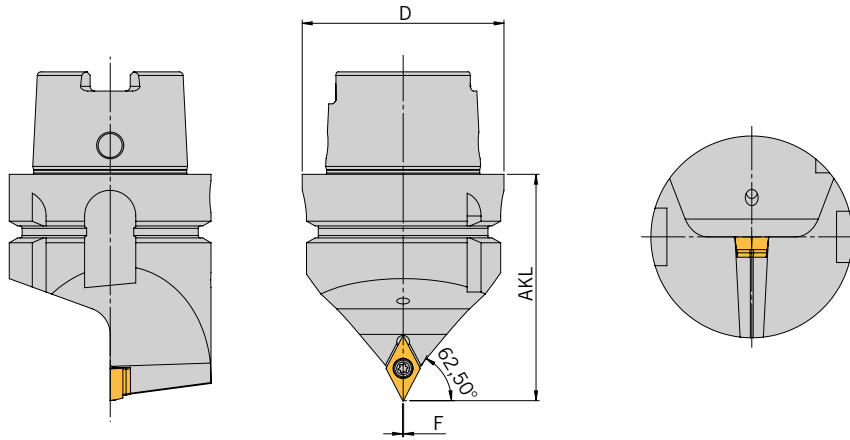
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SDJCL/R 45075-11          | SS 1111              | US 2311                                 | GBS 1111                   | KS 1115              |



## SDNC N

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|-----------------------------|
| HSK-T63-SDNCN 0070-11              | 70  | 63 | DC.. 11T3...                |

### ARNO® SpecialDesign

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Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. È possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

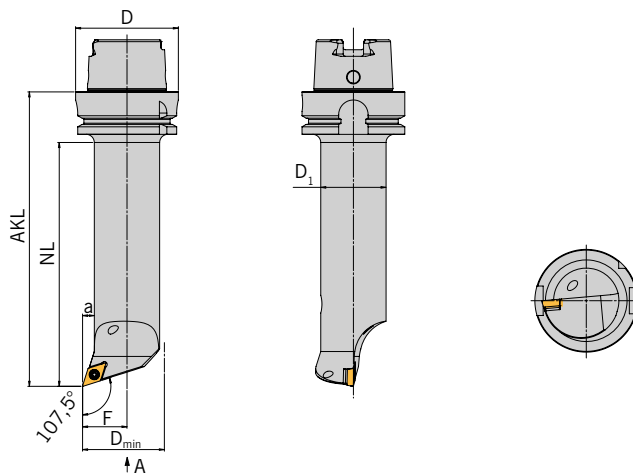
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SDNCN 0070-11             | SS 1111              | US 2311                                 | GBS 1111                   | KS 1115              |

## SDQC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | a | NL  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|---|-----|----|-----------------------------|
| HSK-T63-SDQCL 27180-11             | 180 | 63 | 49               | 40             | 7 | 149 | 27 | DC.. 11T3...                |

 ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

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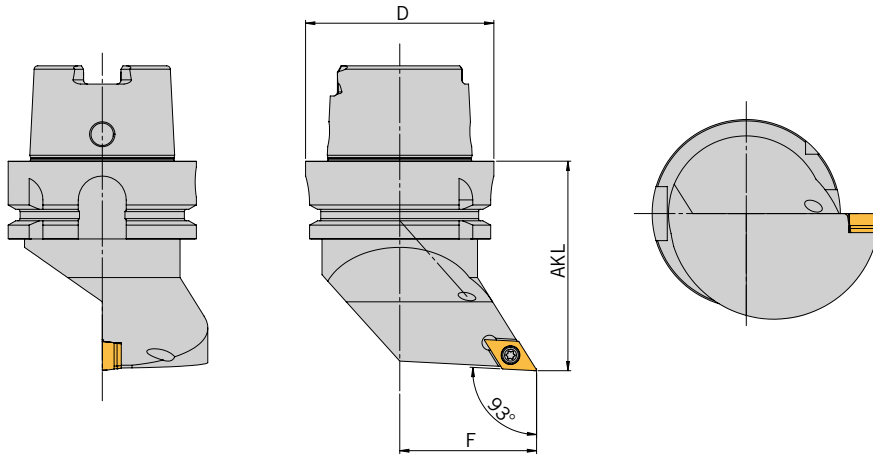
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SDQCL 27180 11            | SS 1111              | US 2311                                 | GBS 1111                   | KS 1115              |

## SDUC L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| HSK-T63-SDUCL/R 45070-11           | 70  | 63 | 45 | DC.. 11T3...                |

### ARNO® SpecialDesign

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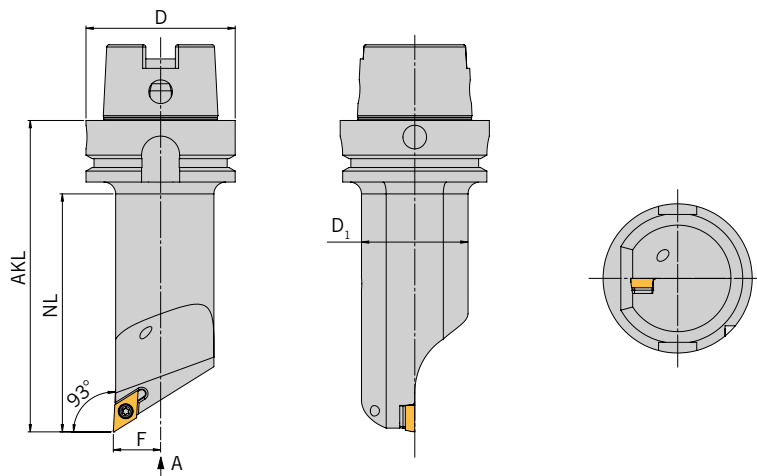
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| ST-SDUCL 11-T                     | SS 1111              | US 2311                                 | GBS 1111                   | KS 1115              |

## SDUC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | L2 | NL | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----------------|----|----|----|-----------------------------|
| ST-SDUCL 11-T                      | 130 | 63 | 45             | 20 | 99 | 20 | DC.. 11T3...                |

### ARNO® SpecialDesign

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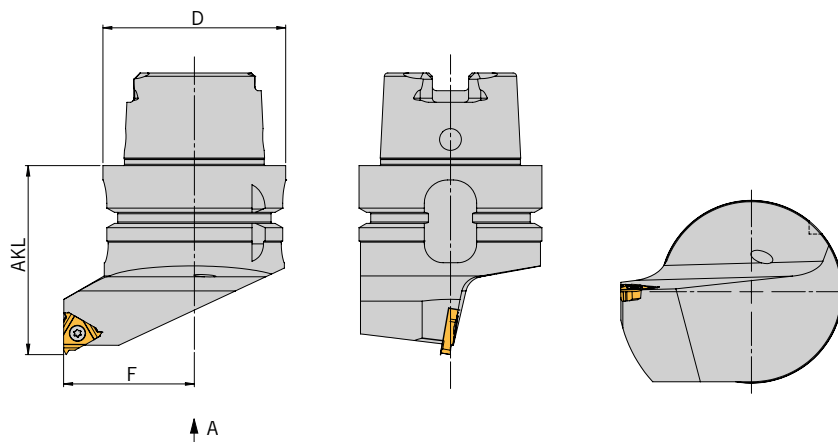
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| ST-SDUCL 11-T                     | SS 1111              | US 2311                                 | GBS 1111                   | KS 1115              |

## SE L

Thread turning / Filettatura / Filetage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|----|----------------------------|
| <b>HSK-T63-SEL 45065-16</b>        | 65  | 63 | 45 | 16E...                     |

### ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. E' possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

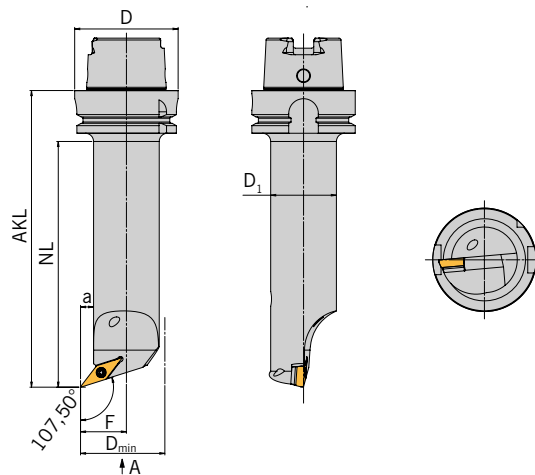
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| <b>HSK-T63-SEL 45065-16</b>       | SA3T                 | Y13                                     | SY3T                       | KS 2510              |

## SVQC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | a | NL  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|---|-----|----|-----------------------------|
| HSK-T63-SVQCL 27180-16             | 180 | 63 | 49               | 40             | 7 | 149 | 27 | VC.. 1604...                |

### ARNO® SpecialDesign

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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SVQCL 27180-16            | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | GBS 1111                   | KS 1115              |

#### 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

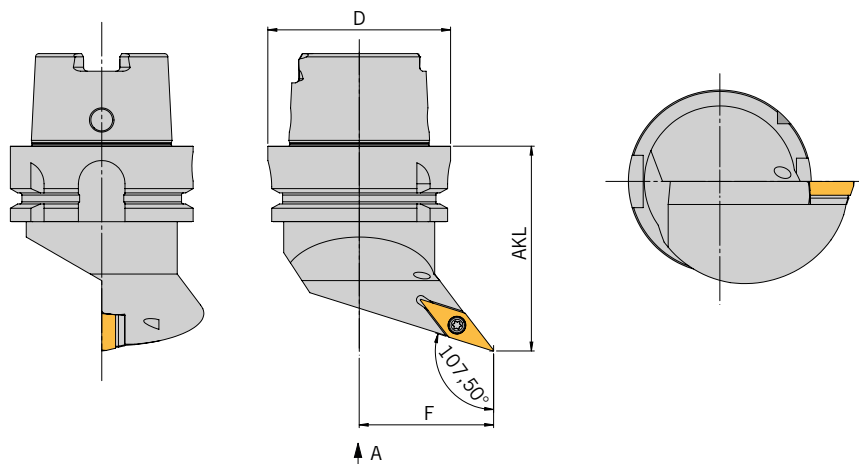
#### 2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

## SVQC L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----|-----------------------------|
| <b>HSK-T63-SVQCL/R 45070-16</b>    | 70  | 63 | 45 | VC.. 1604...                |

### ARNO® SpecialDesign

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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| <b>HSK-T63-SVQCL/R 45070-16</b>   | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | GBS 1111                   | KS 1115              |

#### 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

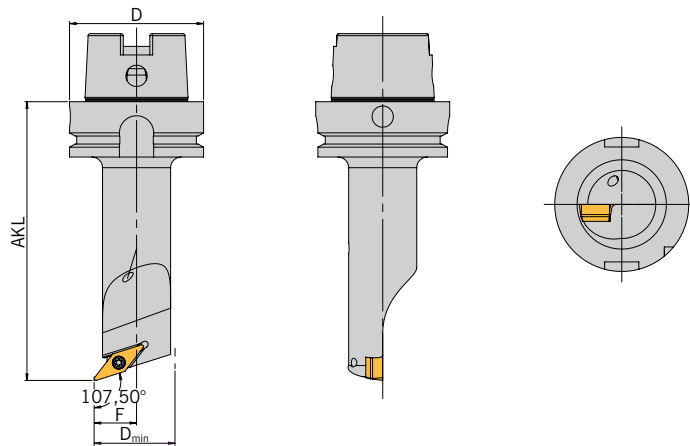
#### 2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

## SVQC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D <sub>min</sub> | a    | F    | Insert<br>Insero<br>Insert |
|------------------------------------|-----|------------------|------|------|----------------------------|
| ST-SVQCL 16-T                      | 131 | 40               | 19,9 | 19,9 | VC.. 1604...               |

### ARNO® SpecialDesign

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## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| ST-SVQCL 16-T                     | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | GBS 1111                   | KS 1115              |

### 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

### 2) For indexable inserts with radius greater than 0.8 mm

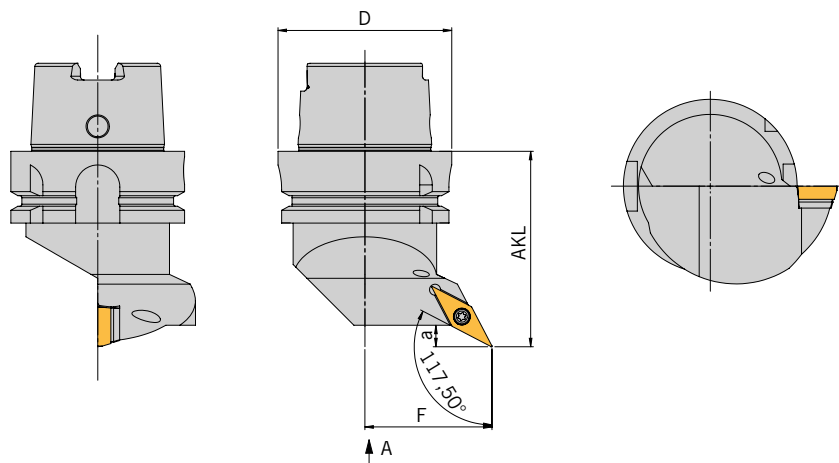
Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm



## SV117,5C L/R

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | a | F  | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|---|----|----------------------------|
| HSK-T63-SV117,5CL/R 45070-16       | 70  | 63 | 7 | 45 | VC.. 1604...               |

 ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. E' possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|---|----------------------------|----------------------|
| HSK-T63-SV117,5C L/R 45070- 16    | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | GBS 1111                   | KS 1115              |

## 1) For indexable inserts with radius up to 0.8 mm

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

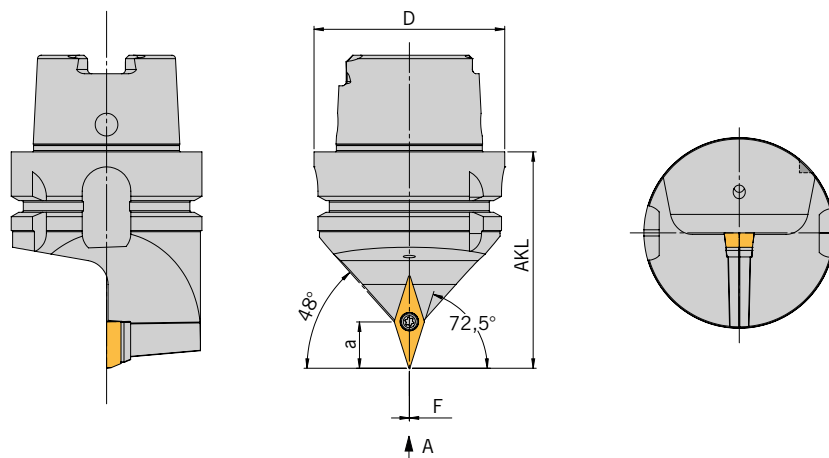
## 2) For indexable inserts with radius greater than 0.8 mm

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

## SVVCN

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | a    | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|------|----------------------------|
| <b>HSK-T63-SVVCN 0070-16</b>       | 70  | 63 | 13,9 | VC.. 1604...               |

### ARNO® SpecialDesign

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Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. E' possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil     | Screw<br>Vite<br>Vis | Support pad<br>Supporto<br>Cale-support       | Bush<br>Bussola<br>Douille | Key<br>Chiave<br>Clé |
|---------------------------------------|----------------------|---|----------------------------|----------------------|
| <b>HSK-T63-SV117,5C L/R 45070- 16</b> | SS 1111              | US 6522 <sup>1)</sup> / US 6523 <sup>2)</sup> | GBS 1111                   | KS 1115              |

**1) For indexable inserts with radius up to 0.8 mm**

Per inserti con un raggio fino a 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon jusqu'à 0,8 mm

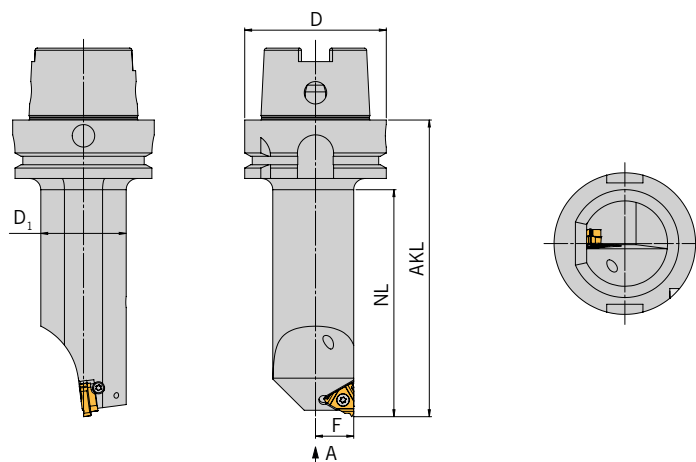
**2) For indexable inserts with radius greater than 0.8 mm**

Per inserti con un raggio maggiore di 0,8 mm

Pour plaquettes de coupe amovibles avec un rayon supérieur à 0,8 mm

## AL16 L/R

Thread turning / Filettatura / Filetage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | a  | F  | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|----|----|----------------------------|
| ST-AL16L/R-T                       | 130 | 63 | 38 | 99 | 16E...                     |

### ARNO® SpecialDesign

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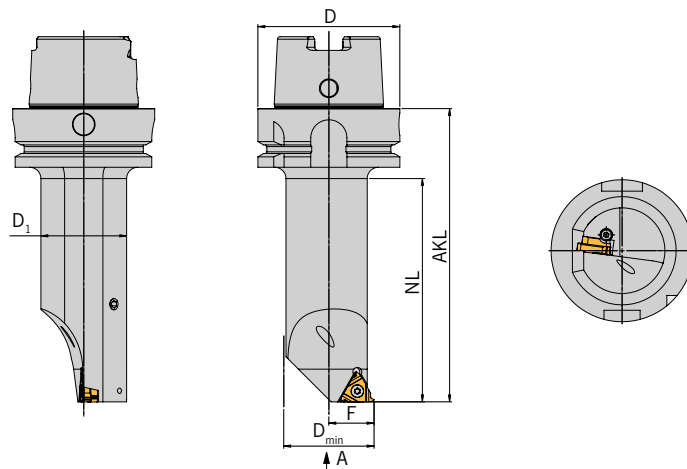
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Support pad<br>Supporto<br>Cale-support | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|--|---|---|----------------------|
| ST-AL16L-T                        | SA3T                 | SY3T   | -                                       | Y13                                     | KS 2510              |
| ST-AL16R-T                        | SA3T                 | SY3T   | YE3                                     | -                                       | KS 2510              |

## NVR

Thread turning / Filettatura / Filetage



3

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | NL | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|------------------|----------------|----|----|-----------------------------|
| ST-NVR16R-T                        | 130 | 63 | 50               | 38             | 99 | 20 | 16I...                      |

### ARNO® SpecialDesign

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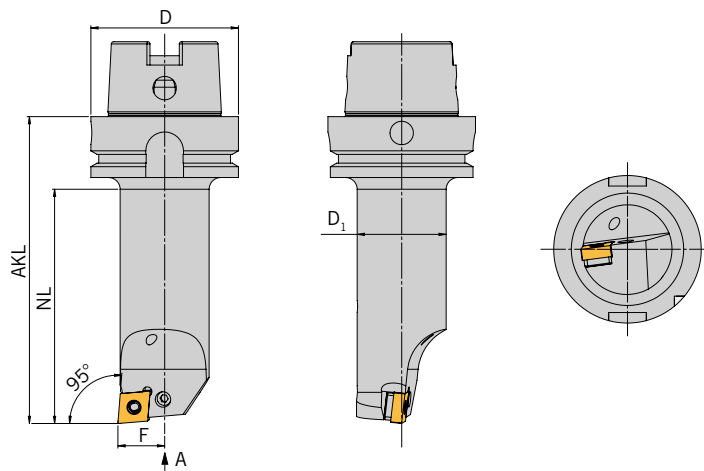
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Threaded pin<br>Grano<br>Vis sans tête | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|--|--|---|----------------------|
| ST-NVR16R-T                       | SA3T                 | SY3T   | DIN913 M6X6                            | Y13                                     | KS 2510              |

## PCLN L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>min</sub> | D <sub>1</sub> | NL | F  | Insert<br>Insero<br>Insert |
|------------------------------------|-----|----|------------------|----------------|----|----|----------------------------|
| ST-PCLNL 12-T                      | 130 | 63 | 38               | 99             | 20 | 20 | CN.. 1204...               |

### ARNO® SpecialDesign

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Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. È possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

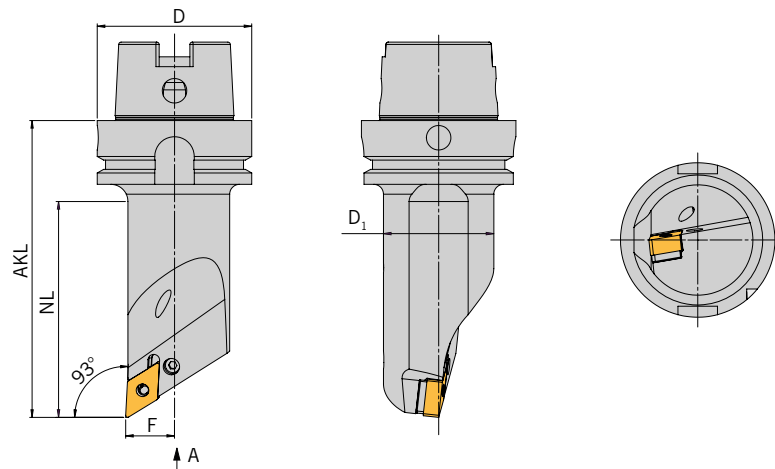
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Support pad<br>Supporto<br>Cale-support | Lever<br>Leva<br>Levier | Hollow pin<br>Spina elastica<br>Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|-------------------------|--|---|----------------------|
| ST-PCLNL 12-T                     | SP 1111  | UP 1111                                 | HP 1111                 | RP 1111  | MP 1111   | KP 1111              |

## PDUN L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | NL | F  | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----------------|----|----|----|-----------------------------|
| ST-PDUNL 15-T                      | 120 | 63 | 45             | 87 | 20 | 20 | DN.. 1506...                |

### ARNO® SpecialDesign

Custom made part-off holders for other machine manufacturers are available on request. Please download the complete enquiry sheet from: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

Adattatori speciali di differenti dimensioni e caratteristiche disponibili a richiesta. È possibile scaricare il modulo di richiesta da: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

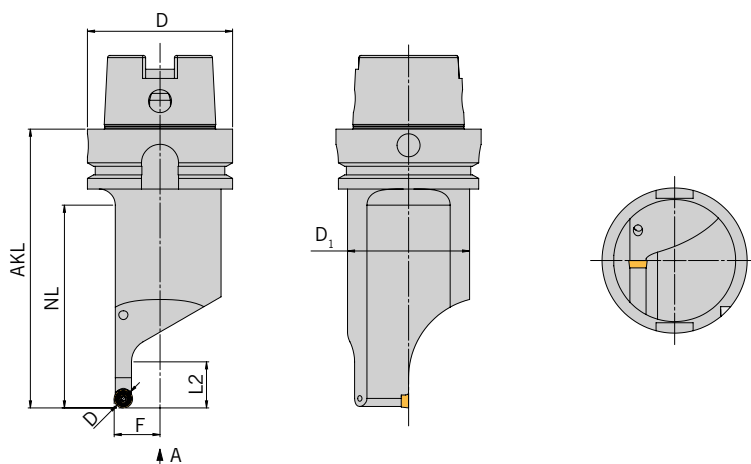
Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Support pad<br>Supporto<br>Cale-support | Lever<br>Leva<br>Levier | Hollow pin<br>Spina elastica<br>Goupille tubulaire | Assembly pin<br>Spina di montaggio<br>Broche de montage | Key<br>Chiave<br>Clé |
|-----------------------------------|--|---|-------------------------|--|---|----------------------|
| ST-PDUNL 15-T                     | SP 1111  | UP 2421                                 | HP 2421                 | RP 1111  | MP 1111   | KP 1111              |

## SRDC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | d | L2 | NL | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----------------|---|----|----|----|-----------------------------|
| ST-SRDCL 08-T                      | 120 | 63 | 53             | 8 | 20 | 87 | 20 | RC.. 0803...                |

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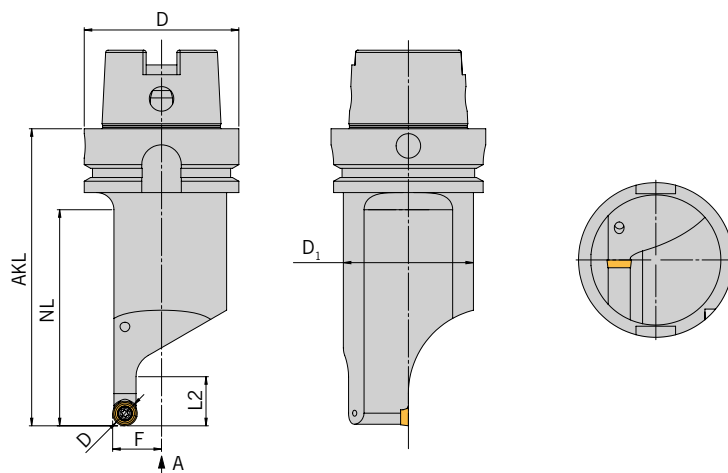
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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| ST-SRDCL 08-T                     | SS 8831              | KS 1751              |

## SRDC L

ISO-Turning / ISO-Tornitura / ISO-Tournage



3

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | AKL | D  | D <sub>1</sub> | d  | L2 | NL | F  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----|----------------|----|----|----|----|-----------------------------|
| ST-SRDCL 10-T                      | 120 | 63 | 53             | 10 | 20 | 87 | 20 | RC.. 1003...                |

### ARNO® SpecialDesign

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Dimensions spéciales et supports de coupe pour d'autres fabricants de machines disponibles sur demande. Un questionnaire est disponible sur Internet à l'adresse suivante: [www.arno.de/service/downloads](http://www.arno.de/service/downloads)

### Spare Parts / Ricambi / Pièces de rechange

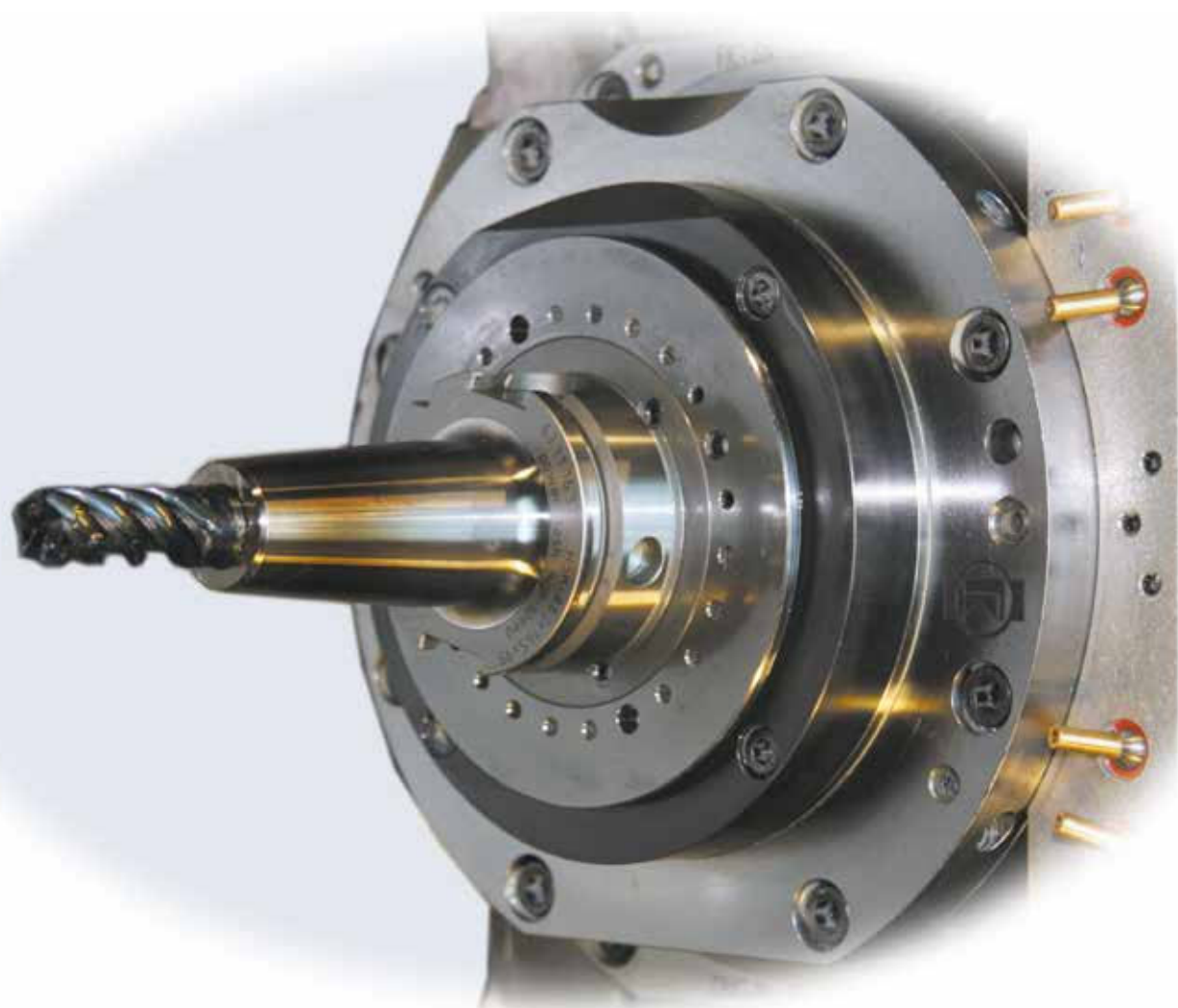
| Holder<br>Utensile<br>Porte-outil | Screw<br>Vite<br>Vis | Bush<br>Bussola<br>Douille | Support pad<br>Supporto<br>Cale-support | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------------|---|----------------------|
| ST-SRDCL 08-T                     | SS 1111              | GBS 1111                   | US 3431                                 | KS 1115              |



# TOOL HOLDERS WITH HOLLOW TAPER SHANKS ISO 69893-1

## PORTAUTENSILI CON CONO CAVO SECONDO DIN 69893-1

### SUPPORTS D'OUTILS AVEC CÔNE CREUX DIN 69893-1



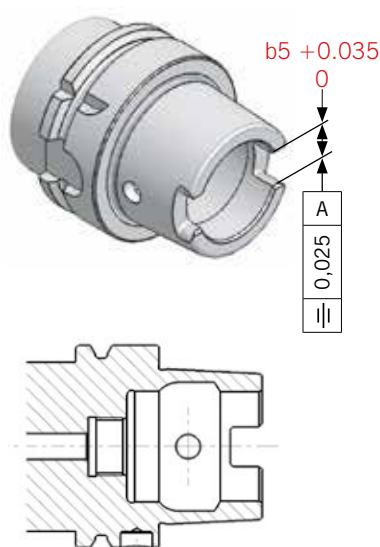
- Material:** Alloy case-hardened steel with a core tensile strength of min. 800 N/mm<sup>2</sup>  
**Materiale:** Acciaio legato con una resistenza alla trazione nel nocciolo di min. 800 N/mm<sup>2</sup>  
**Matériau :** acier cémenté allié avec une résistance à la traction au centre de min. 800 N/mm<sup>2</sup>
- Design:** Case-hardened HRc 60 - 2 (HV 700 ± 50), Hardness depth 0.8 mm - 0.2 mm.  
**Burnished and precision-ground**
- Esecuzione:** temprato HRc 60 - 2 (HV 700 ± 50). Profondità di tempra 0,8 mm - 0,2,  
Brunito e rettificato di precisione
- Modèle :** cémenté et trempé HRc 60 - 2 (HV 700 ± 50), Profondeur de durcissement 0,8 mm - 0,2,  
Brunis et rectifiés avec précision

**Subject to technical changes** / *Salvo modifiche tecniche* / Sous réserve de modifications techniques

## FEATURES

### CARATTERISTICHE

### SERRAGE PAR BRIDE



#### What is HSK-T?

The "T" stands for turning. The HSK-T has the basic shape of the HSK type according to Forms A/C (ISO 12164-1 and -2). It mainly differs from the HSK by much tighter tolerances of the drive keys (tool) and the key blocks (holder). This ensures the important radial positioning accuracy (tip height) required for turning. All dimensions and tolerances are stipulated in ISO 12164-3/4 ( ...-3 outer taper – tool and ...-4 inner taper – holder).

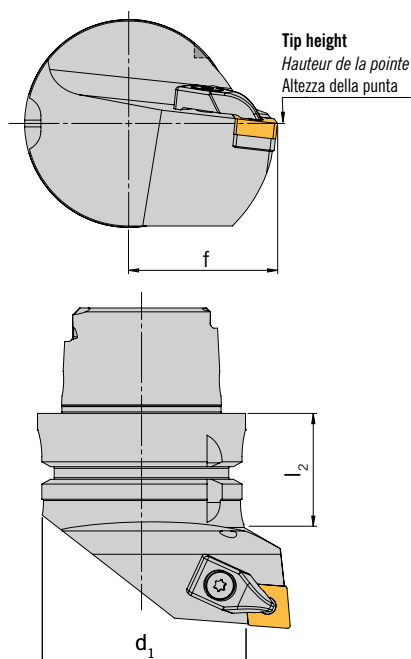
#### Cos'è HSK-T

La "T" sta per Turning (tornitura). L'HSK-T ha la forma di base del cono HSK secondo la forma A / C (ISO 12164-1 e -2) e si distingue da questo essenzialmente per le tolleranze più contenute della scanalatura di trascinamento (utensile) e del fermo di trascinamento (alloggiamento). In questo modo la precisione radiale di posizionamento (altezza delle punte), importante per la tornitura, è garantita. Tutte le dimensioni e le tolleranze sono stabilite nella norma ISO 12164-3/4 ( ...-3 cono esterno - utensile e ...-4 cono interno - alloggiamento).

#### Qu'est-ce qu'HSK-T ?

Le « T » signifie « turning » (tournage). L'HSK-T a la forme de base du cône HSK conformément à la forme A / C (ISO 12164-1 et -2) et se distingue de celui-ci essentiellement par des tolérances nettement plus étroites des rainures d'entraînement (outil) et des lardons d'entraînement (support). La précision de positionnement radial (hauteur de pointe), essentielle pour le tournage, est ainsi assurée. Toutes les dimensions et tolérances sont définies dans la norme ISO 12164-3/4 ( ...-3 cône externe – outil et ...-4 cône interne – support).

## BENEFITS / VANTAGGI / BÉNÉFICES



#### Perfect change accuracy – including tip height

The positioning tolerance of the edge tip height is therefore reduced on HSK-T63 with a dimension  $f$  45 mm to  $\pm 0.13$  mm and on HSK-T100 with a dimension  $f$  55 mm to  $\pm 0.11$  mm.

#### For machines with HSK-T and HSK-A spindles

The dimensions  $d_1$  and  $l_2$  to ISO 12164-1 (HSK-A) are executed on all HSK-T tools.

They can therefore be changed automatically on machines designed for HSK-A tools (tool changer).

#### Perfetta precisione di cambio - anche per l'altezza delle punte

La tolleranza di posizionamento dell'altezza delle punte del tagliente dell'utensile viene ridotta per HSK-T63 con misura  $f$  45 mm a  $\pm 0,13$  mm oppure per HSK-T100 con misura  $f$  55 mm a  $\pm 0,11$  mm.

#### Utilizzabile sulle macchine con mandrino HSK-T e HSK-A

Su tutti gli utensili HSK-T le misure  $d_1$  e  $l_2$  sono realizzate secondo della norma ISO 12164-1 (HSK-A). È possibile in questo modo sostituire automaticamente gli utensili anche su macchine che sono progettate per gli utensili HSK-A (cambiautensili).

#### Précision de changement optimale – même pour la hauteur de pointe

La tolérance de positionnement de la hauteur de pointe du tranchant d'outil est ainsi réduite à  $\pm 0,13$  mm pour HSK-T63 avec dimension  $f$  45 mm et à  $\pm 0,11$  mm pour HSK-T100 avec dimension  $f$  55 mm.

#### Utilisables sur les machines équipées de broches HSK-T et HSK-A

Tous les outils HSK-T sont conçus dans les dimensions  $d_1$  et  $l_2$  conformément à ISO 12164-1 (HSK-A). Par conséquent, ils peuvent aussi être changés automatiquement sur des machines conçues pour des outils HSK-A (changeur d'outils).

**STAMA**  
**STAMA**  
**STAMA****A perfect team: ARNO tools for STAMA machining centres****Your benefits**

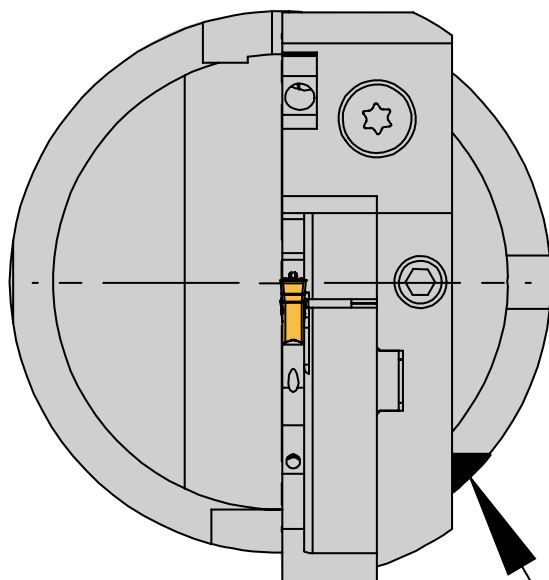
- Fast automatic tool change
- Extreme tool change accuracy
- Optimized machining process
- High-precision machining quality
- Long tool life
- Tool savings

**L'unione perfetta: ARNO Werkzeuge per centri di lavorazione STAMA****I vantaggi per Lei**

- Cambio utensile automatico rapido
- Massima precisione nel cambio utensile
- Ottimizzazione del processo di lavorazione
- Qualità di lavorazione estremamente precisa
- Elevata durata degli utensili
- Risparmio di utensili

**L'alliance parfaite : outils ARNO pour centres d'usinage STAMA****Vos avantages**

- Changement rapide et automatique des outils
- Précisions extrêmes du changement d'outils
- Optimisation du processus d'usinage
- Qualité d'usinage de haute précision
- Longue durée de vie des outils
- Économies d'outils

**Orientation notch on bottom right as per STAMA***Tacca di orientamento secondo STAMA in basso a destra*

Encoche d'orientation selon STAMA en bas à droite

# ISO INDEXABLE INSERTS

## ISO indexable inserts

- System presentation
- ISO designation systems
  - HC - solid carbide coated
  - HU - solid carbide uncoated
  - CC - Cermet coated
  - CU - Cermet uncoated
- Geometry descriptions
  - ISO NEGATIVE indexable inserts
  - ISO POSITIVE indexable inserts
  - ISO HIGH-POSITIVE indexable inserts
- Practical example
- ISO Indexable inserts
- Recommended cutting data
- Application notes

## Inserti ISO

- *Presentazione del sistema*
- *Sistema di identificazione ISO*
  - *HC - metallo duro rivestito*
  - *HU - metallo duro non rivestito*
  - *CC - Cermet rivestito*
  - *CU - Cermet non rivestito*
- *Descrizioni geometrie*
  - *Inserti ISO NEGATIVI*
  - *Inserti ISO POSITIVI*
  - *Inserti ISO ALTAMENTE POSITIVI*
- *Esempi pratici*
- *Inserti a fissaggio meccanico-ISO*
- *Parametri di taglio suggeriti*
- *Suggerimenti tecnici*

## Plaquettes de coupe amovibles ISO

- Présentation du système **224 – 235**
- Système de désignation ISO **236 – 237**
  - HC – carbure avec revêtement **238 – 250**
  - HU – carbure sans revêtement **251 – 253**
  - CC – cermet avec revêtement **254**
  - CC – cermet sans revêtement **255**
- Descriptions des géométries
  - Plaquettes de coupe amovibles ISO NÉGATIVES **256 – 263**
  - Plaquettes de coupe amovibles ISO POSITIVES **264 – 271**
  - Plaquettes de coupe amovibles ISO HAUTEMENT POSITIVES **272 – 275**
- Exemple concret **276 – 281**
- Plaquettes de coupe amovibles ISO **282 – 375**
- Paramètres de coupe suggérés **376 – 411**
- Consignes d'utilisation **413 – 421**



# 4

# SOFT MATERIALS – SHARP CUTTING.

**Ideal for long-chipping materials, thin-walled components and high-quality surface finish: high-positive indexable inserts with sharp cutting edge from ARNO.**

If you are looking for extremely cutting indexable inserts, you will definitely find the right one in our product range. The diversity of high-positive indexable inserts that ARNO offers is unique in the world. Just as much as the quality. All high-positive indexable inserts consist of an ultrafine grain substrate. They are precision ground and have a polished chip breaker.

When you machine soft materials such as aluminium, you have the choice of different coated or uncoated grades, geometries, standard sizes, intermediate sizes and corner radii ranging from 0.05 to 3.0 mm. There are additional coatings for steels and stainless steels. On demand, there are also rounded variants for machining steel and exotic materials. These variants have an extremely long tool life. Whatever high-positive indexable inserts you may choose, they are guaranteed to have high-quality surface finish and produce precision results.



## CUTTING BENEFITS

of high-positive indexable inserts in the sharp variant

Largest diversity of high-positive geometries in the world

Best quality by precision grinding

Extremely sharp smooth cutting for low cutting forces

## High-positive indexable inserts for additional applications.

- ASF, ACB, AWI and ALU inserts are not the only solution for long-chipping materials.
- The right coating make them perfect for finish machining steel and stainless steel.
- The cutting edges can also be rounded to machine exotic materials.



## Grinding skills for over 30 years

- About 3 million indexable inserts are precision-ground every year at ARNO.
- Including rounding inhouse.
- The know-how we have amassed over decades is visible in the no-compromise quality of the flutes.

# EXOTIC MATERIALS – GREAT SOLUTIONS.

**Ideal for super-finishing high-temperature resistant materials and stainless steels: high-positive indexable inserts with rounded cutting edge from ARNO.**

Do you require efficient, high-precision machining of materials that are difficult to cut? Such as titanium or super alloys? We have the solution: our high-positive indexable inserts with rounded cutting edge. They are sharp enough to minimise cutting forces but offer excellent edge stability thanks to the rounding. Their matching high-tech coatings make them well prepared to overcome the poor thermal conductivity of exotic materials.

**The alternative for exotic materials: sintered indexable inserts with special geometries from ARNO.**

Negative NFT, NMT and NMT1 inserts are reliable, cost-effective solutions for light machining through to roughing. In addition, the positive PMT1 insert is ideal for the semi-roughing of super alloys. They are all convincing for machining tough materials due to their high notch wear resistance and thermal resistance. The special geometries ensure excellent chip control and therefore absolute process reliability.

In any case, a good choice for long tool life for machining exotic materials: ARNO tool holders with through tool coolant – the flute is cooled efficiently and chips are optimally removed.



## EFFICIENT BENEFITS

of ARNO indexable inserts for exotic materials

Long tool life thanks to excellent thermal resistance and notch wear resistance

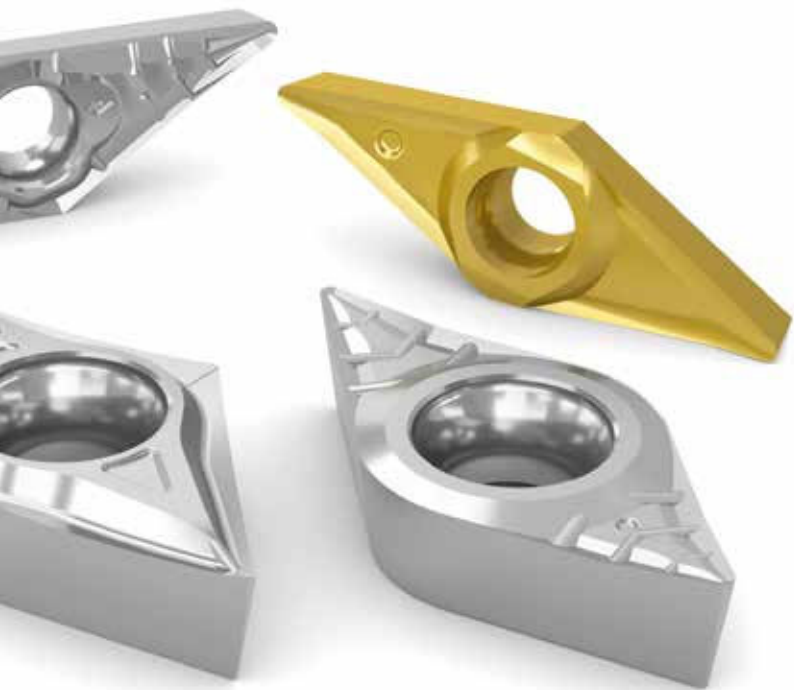
Reduced number of rejects due to reliable processes and precise machining

Wide choice – negative specialists for finish machining through to roughing work, high-positive indexable inserts for super-finishing



## The specialists for rough turning

- Our NFT, NMT and NMT1 geometries are reliable for machining high temperature and super alloys – whether it is Inconel or Hasteloy.
- The inserts also shine by their extreme durability at high temperatures and with tough materials.



## Machining exotic materials then becomes a dream

- The high-positive ASF, ACB, AW- and ALU inserts with rounded cutting edges are ideal for machining materials that are difficult to cut, such as titanium and high-temperature resistant super alloys. Especially when combined with the right coating.



# MATERIALI TENERI – TAGLIENTI AFFILATI.

**Ideali per materiali a truciolo lungo, componenti sottili e per le finiture superficiali più elevate:  
Inseri altamente positivi con tagliente affilato di ARNO.**

Se Lei sta cercando inserti estremamente taglienti da noi li troverà sicuramente: La varietà di inserti altamente positivi offerta da ARNO è unica in tutto il mondo. Proprio come la sua qualità: Tutti gli inserti altamente positivi sono composti da un substrato a grana ultra-fine, sono rettificati di precisione e hanno un canale formatruciolo lappato.

Per la lavorazione su misura di materiali teneri come alluminio, Lei può scegliere tra diverse varietà rivestite o non rivestite, geometrie, dimensioni standard e intermedie e tra diversi raggi di punta da 0,05 a 3,0 mm. Per acciai e acciai inox inoltre sono disponibili ulteriori rivestimenti. E se necessario sono disponibili anche varianti arrotondate per la lavorazione di acciai e materiali esotici che si distinguono per la durata estrema. Indipendentemente dall'inserto altamente positivo che Lei sceglierà, sono garantiti le finiture superficiali più elevate e i risultati più precisi.



## VANTAGGI DI TAGLIO

degli inserti altamente positivi nella variante  
affilata

La maggiore varietà a livello internazionale di  
geometrie altamente positive

Ottima qualità grazie alla rettifica di precisione

Taglienti estremamente affilati e lisci per forze di  
taglio contenute

## Inserti altamente positivi per infinite applicazioni.

- Gli inserti ASF, ACB, AWI e ALU non sono solo la soluzione per materiali a truciolo lungo:
- con il rivestimento più adatto sono perfetti per la finitura dell'acciaio e dell'acciaio inox.
- Per i materiali esotici sono perfetti con i taglienti arrotondati.



4

## Competenza della lavorazione di rettifica da 30 anni

- Circa 3 milioni di inserti vengono realizzati con rettifica di precisione da ARNO ogni anno.
- Anche la realizzazione degli arrotondamenti avviene inhouse.
- Il know-how decennale realizzato in questo settore è evidente nella qualità di taglio senza compromessi.

# MATERIALI ESOTICI – SOLUZIONI FORTI.

**Ideali per la lavorazione fine di materiali resistenti alle alte temperature e di acciai inossidabili: Inserti altamente positivi con tagliente arrotondato di ARNO.**

Deve lavorare materiali difficili da tagliare come titanio e superleghe in maniera efficiente ed estremamente precisa? Noi abbiamo la soluzione: i nostri inserti altamente positivi con tagliente arrotondato. Sono sufficientemente affilati da consentire di mantenere contenuta la forza di taglio e, grazie all'arrotondamento, offrono una eccellente stabilità del profilo. Adeguati rivestimenti high-tech sono inoltre la soluzione perfetta per resistere alla scarsa conducibilità termica di materiali esotici.

**L'alternativa con i materiali esotici: Inserti sinterizzati con geometrie speciali di ARNO.**

Gli inserti negativi NFT, NMT e NMT1 sono la soluzione affidabile ed economica dalla lavorazione più leggera alla sgrossatura. Inoltre l'inserto positivo PMT1 è ottimale per la lavorazione media di superleghe. Tutti questi inserti sono affidabili per l'elevata resistenza all'usura e al calore con materiali resistenti. Le geometrie specifiche garantiscono un eccellente controllo della truciatura e quindi un'assoluta sicurezza di processo.

In ogni caso sono una ottima scelta che garantisce lunghe durate durante la lavorazione di materiali esotici: Utensili ARNO con adduzione interna del refrigerante - il tagliente viene raffreddato efficacemente e i trucioli vengono evacuati in maniera ottimale.



## VANTAGGI EFFICACI

gli inserti ARNO per materiali esotici

Elevata durata grazie all'eccellente resistenza al calore e alla resistenza all'usura.

Evitare scarti grazie a processi sicuri e a una lavorazione precisa.

Grande scelta - inserti per lavorazioni di finitura e sgrossatura, inserti altamente positivi per le lavorazioni fini



## Gli specialisti per lavori di sgrossatura

- Inconel o Hasteloy - le leghe ad alte temperature e le superleghe vengono lavorate in sicurezza con le nostre geometrie NFT, NMT e NMT1.
- Gli inserti si distinguono anche nelle lavorazioni ad alte temperature e con materiali resistenti, grazie alla loro estrema resistenza.



## In questo modo con i materiali esotici la lavorazione avviene senza problemi

- Gli inserti altamente positivi ASF, ACB, AWI e ALU con arrotondamento del tagliente in combinazione con i corrispondenti rivestimenti sono la soluzione ottimale per i materiali difficili da lavorare come il titanio e le superleghe resistenti al calore.

# MATÉRIAUX TENDRES – ARÊTES POSITIVES.

**Idéales pour les matériaux à copeaux longs, les composants délicats et les finitions de surface de qualité supérieure : les plaquettes de coupe amovibles hautement positives à arêtes vives d'ARNO.**

Si vous recherchez des plaquettes de coupe amovibles extrêmement affûtées, vous les trouverez certainement chez nous : en effet, la grande diversité de plaquettes de coupe amovibles proposées par ARNO est unique au monde. Il en va de même pour la qualité : toutes les plaquettes de coupe amovibles hautement positives se composent d'un substrat spécifique au grain ultra fin, sont rectifiées avec précision et sont dotées d'un brise-copeaux poli.

Pour l'usinage sur mesure des matériaux tendres comme l'aluminium, vous avez le choix entre différentes sortes avec ou sans revêtement, géométries, dimensions standard et intermédiaires ainsi que différents rayons d'angle allant de 0,05 à 3,0 mm. En outre, il existe d'autres revêtements pour les aciers et aciers inoxydables. Et au besoin, des versions arrondies, qui rayonnent par des durées de vie extrêmes, sont disponibles pour l'usinage d'aciers et de matériaux exotiques. Peu importe les plaquettes de coupe amovibles hautement positives que vous choisissiez : finitions de surface de qualité supérieure et résultats précis sont garantis.



## LES AVANTAGES INCROYABLES

des plaquettes de coupe amovibles hautement positives en version tranchante

Le plus grand choix au monde de géométries hautement positives

La meilleure qualité grâce à un affûtage de précision

Arêtes extrêmement tranchantes et lisses pour des faibles pressions de coupe

### Plaquettes de coupe amovibles hautement positives pour d'autres applications.

- Les plaquettes ASF, ACB, AWI et ALU ne sont pas seulement la solution pour les matériaux à copeaux longs :
- avec le revêtement adéquat, elles conviennent aussi parfaitement à la finition de l'acier et de l'acier inoxydable.
- Une préparation d'arête peut également être proposée pour les matériaux exotiques.



### Compétence en matière de rectification depuis 30 ans

- Près de 3 millions de plaquettes de coupe amovibles sont affûtées avec précision chaque année chez ARNO.
- La préparation d'arêtes est également réalisée en interne.
- Le savoir-faire accumulé au fil des décennies dans ce domaine se reflète dans la qualité de coupe sans compromis.

# MATÉRIAUX EXOTIQUES – SOLUTIONS PERFORMANTES.

**Idéales pour la super finition de matériaux réfractaires et d'aciers inoxydables : les plaquettes de coupe amovibles hautement positives avec préparation d'arêtes d'ARNO.**

Vous devez usiner des matériaux très résistants comme le titane ou les superalliages avec efficacité et précision extrême ? Nous avons la solution : nos plaquettes de coupe amovibles hautement positives à arêtes préparées. Elles sont suffisamment tranchantes pour maintenir une faible pression de coupe et, grâce à leur préparation, elles offrent une excellente stabilité d'arête. Elles sont également parfaitement parées pour la mauvaise conductivité thermique des matériaux exotiques grâce à des revêtements haute technologie adéquats.

**L'alternative pour les matériaux exotiques : plaquettes de coupe amovibles frittées avec géométries spéciales d'ARNO.**

Les plaquettes NFT, NMT et NMT1 négatives sont des solutions fiables et économiques pour l'usinage plus léger jusqu'à l'ébauche. En outre, la plaquette PMT1 positive convient idéalement pour l'usinage moyen de superalliages. Toutes conviennent avec les matériaux résistants grâce à une grande résistance à l'usure en entaille et à la chaleur. Les géométries spéciales assurent un contrôle remarquable des copeaux et ainsi une sécurité de processus absolue.

Dans tous les cas, le bon choix pour une longue durée de vie dans l'usinage de matériaux exotiques : porte-outils ARNO avec refroidissement interne – refroidissement efficace de la dent et évacuation optimale des copeaux.



## LES AVANTAGES EFFICACITÉ

des plaquettes de coupe amovibles ARNO pour matériaux exotiques

Longue durée de vie grâce à une grande résistance à la chaleur et à l'usure en entaille

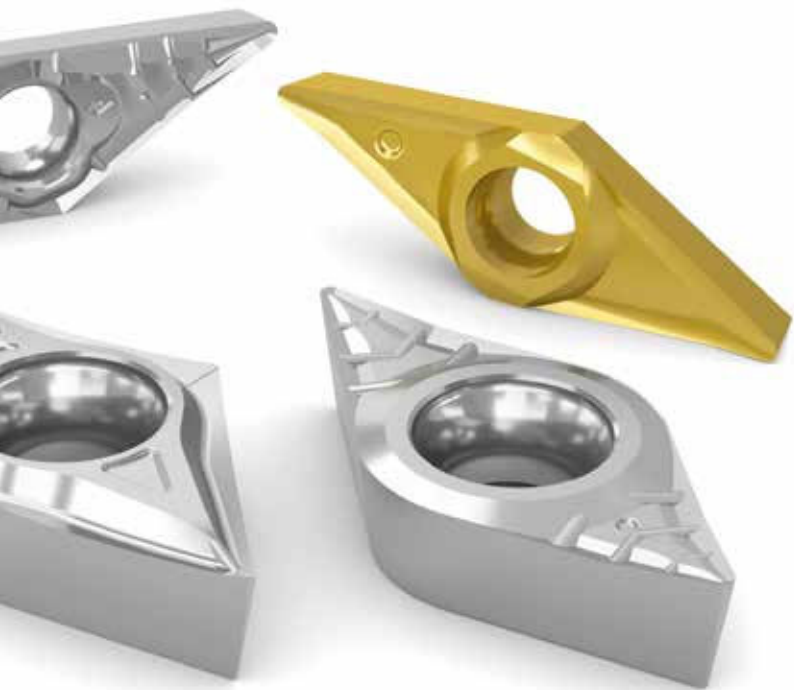
Déchets évités grâce à des processus sûrs et à un usinage précis

Grand choix – plaquettes négatives pour les usinages de finition et ébauches, plaquettes de coupe amovibles hautement positives pour les super finitions



### Les spécialistes des gros travaux

- Qu'il s'agisse d'Inconel ou d'Hasteloy – les alliages à haute température ou les superalliages sont usinés en toute sécurité grâce à nos géométries NFT, NMT et NMT1.
- Les plaquettes se distinguent même à des températures élevées et avec des matériaux durs grâce à une endurance extrême.



### Tout est possible avec les matériaux exotiques

- Les plaquettes ASF, ACB, AWI et ALU hautement positives avec bords tranchants arrondis conviennent idéalement pour les matériaux difficiles à usiner comme le titane ou les superalliages réfractaires lorsqu'elles sont combinées à des revêtements appropriés.



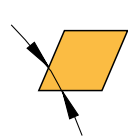
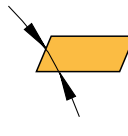








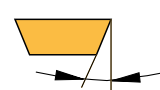
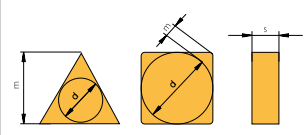
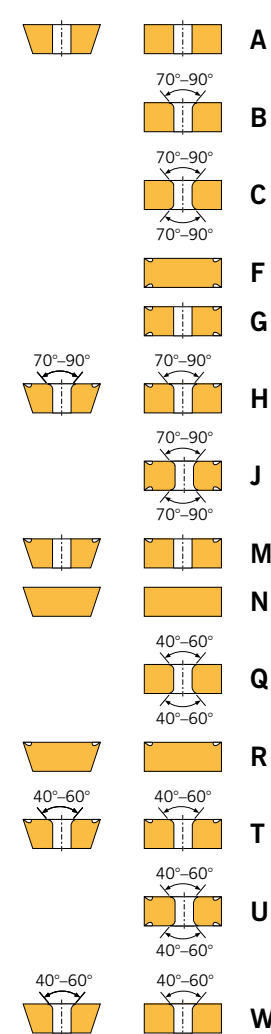
# System presentation

Presentazione del sistema

Présentation du système

## ISO DESIGNATION SYSTEM FOR TOOL HOLDERS SISTEMA DI IDENTIFICAZIONE ISO PER INSERTI SYSTÈME DE DÉSIGNATION ISO POUR SUPPORTS DE SERRAGE

4

| C  | N  | M   | G  |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
|--|--|---|--|--|-----------------|-------------------------|--|----------------------|-------------------------|--|----------------------|-----|-----|-----|-------|-------|-------|----------|-------|-------|-------|----------|-------|-------|-------|----------|-------|-------|-------|----------|-------|-------|-----------|----------|-------|-------|-------|----------|-----------|-------|-------|----------|-----------|-------|-------|----------|-----------|-------|-------|----------|-----------|----------|-----------|----------|-----------|----------|-------|----------|-----------|-----------|------|----------|--|
| <b>INSERT SHAPE</b><br>FORMA DI INSERTO<br>FORME DE PLAQUETTE  | <b>CLEARANCE ANGLE</b><br>ANGOLI DI SPOGLIA<br>INFERIORI<br>ANGLE DE DÉPOUILLE   | <b>TOLERANCES</b><br>TOLLERANZE<br>TOLERANCES   | <b>INSERT TYPE</b><br>TIPO DI INSERTO<br>TYPE DE PLAQUETTE |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
|  <p>80° <b>C</b><br/>55° <b>D</b><br/>75° <b>E</b><br/>86° <b>M</b><br/>35° <b>V</b></p>  <p>85° <b>A</b><br/>82° <b>B</b><br/>55° <b>K</b></p> <p> <b>H</b><br/> <b>L</b><br/> <b>O</b><br/> <b>P</b><br/> <b>R</b><br/> <b>S</b><br/> <b>T</b><br/> <b>W</b></p> |  <p>3° <b>A</b><br/>5° <b>B</b><br/>7° <b>C</b><br/>15° <b>D</b><br/>20° <b>E</b><br/>25° <b>F</b><br/>30° <b>G</b><br/>0° <b>N</b><br/>11° <b>P</b></p> <p>Others → <b>O</b><br/><i>Altri</i><br/><i>Autres</i></p> |  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Tolerance range [mm]</th> <th>Tolerance class</th> </tr> <tr> <th colspan="2">Scostamenti limite [mm]</th> <th>Classe di tolleranza</th> </tr> <tr> <th colspan="2">Dimensions limites [mm]</th> <th>Classe de tolérances</th> </tr> <tr> <th>d ±</th> <th>m ±</th> <th>s ±</th> </tr> </thead> <tbody> <tr> <td>0,025</td> <td>0,005</td> <td>0,025</td> <td><b>A</b></td> </tr> <tr> <td>0,025</td> <td>0,013</td> <td>0,025</td> <td><b>C</b></td> </tr> <tr> <td>0,025</td> <td>0,025</td> <td>0,025</td> <td><b>E</b></td> </tr> <tr> <td>0,013</td> <td>0,005</td> <td>0,025</td> <td><b>F</b></td> </tr> <tr> <td>0,025</td> <td>0,025</td> <td>0,05-0,13</td> <td><b>G</b></td> </tr> <tr> <td>0,013</td> <td>0,013</td> <td>0,025</td> <td><b>H</b></td> </tr> <tr> <td>0,05-0,15</td> <td>0,005</td> <td>0,025</td> <td><b>J</b></td> </tr> <tr> <td>0,05-0,15</td> <td>0,013</td> <td>0,025</td> <td><b>K</b></td> </tr> <tr> <td>0,05-0,15</td> <td>0,025</td> <td>0,025</td> <td><b>L</b></td> </tr> <tr> <td>0,05-0,15</td> <td>0,08-0,2</td> <td>0,05-0,13</td> <td><b>M</b></td> </tr> <tr> <td>0,05-0,15</td> <td>0,08-0,2</td> <td>0,025</td> <td><b>N</b></td> </tr> <tr> <td>0,08-0,25</td> <td>0,13-0,38</td> <td>0,13</td> <td><b>U</b></td> </tr> </tbody> </table> <p>Special shape → <b>X</b><br/><i>Esecuzione speciale</i><br/><i>Modèle spécial</i></p> | Tolerance range [mm]                                       |  | Tolerance class | Scostamenti limite [mm] |  | Classe di tolleranza | Dimensions limites [mm] |  | Classe de tolérances | d ± | m ± | s ± | 0,025 | 0,005 | 0,025 | <b>A</b> | 0,025 | 0,013 | 0,025 | <b>C</b> | 0,025 | 0,025 | 0,025 | <b>E</b> | 0,013 | 0,005 | 0,025 | <b>F</b> | 0,025 | 0,025 | 0,05-0,13 | <b>G</b> | 0,013 | 0,013 | 0,025 | <b>H</b> | 0,05-0,15 | 0,005 | 0,025 | <b>J</b> | 0,05-0,15 | 0,013 | 0,025 | <b>K</b> | 0,05-0,15 | 0,025 | 0,025 | <b>L</b> | 0,05-0,15 | 0,08-0,2 | 0,05-0,13 | <b>M</b> | 0,05-0,15 | 0,08-0,2 | 0,025 | <b>N</b> | 0,08-0,25 | 0,13-0,38 | 0,13 | <b>U</b> |  <p><b>A</b><br/>70°-90°<br/><b>B</b><br/>70°-90°<br/><b>C</b><br/>70°-90°<br/><b>F</b><br/><b>G</b><br/>70°-90°<br/><b>H</b><br/>70°-90°<br/><b>J</b><br/>70°-90°<br/><b>M</b><br/><b>N</b><br/>40°-60°<br/><b>Q</b><br/>40°-60°<br/><b>R</b><br/>40°-60°<br/>40°-60°<br/><b>T</b><br/>40°-60°<br/>40°-60°<br/><b>U</b><br/>40°-60°<br/>40°-60°<br/><b>W</b></p> <p>Special shape → <b>X</b><br/><i>Esecuzione speciale</i><br/><i>Modèle spécial</i></p> |
| Tolerance range [mm]   |  | Tolerance class   |  |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| Scostamenti limite [mm]  |  | Classe di tolleranza  |  |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| Dimensions limites [mm]  |  | Classe de tolérances  |  |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| d ±  | m ±  | s ±   |  |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,025  | 0,005  | 0,025   | <b>A</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,025  | 0,013  | 0,025   | <b>C</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,025  | 0,025  | 0,025   | <b>E</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,013  | 0,005  | 0,025   | <b>F</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,025  | 0,025  | 0,05-0,13   | <b>G</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,013  | 0,013  | 0,025   | <b>H</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,05-0,15  | 0,005  | 0,025   | <b>J</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,05-0,15  | 0,013  | 0,025   | <b>K</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,05-0,15  | 0,025  | 0,025   | <b>L</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,05-0,15  | 0,08-0,2   | 0,05-0,13   | <b>M</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,05-0,15  | 0,08-0,2   | 0,025   | <b>N</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |
| 0,08-0,25  | 0,13-0,38  | 0,13  | <b>U</b>   |  |                 |                         |  |                      |                         |  |                      |     |     |     |       |       |       |          |       |       |       |          |       |       |       |          |       |       |       |          |       |       |           |          |       |       |       |          |           |       |       |          |           |       |       |          |           |       |       |          |           |          |           |          |           |          |       |          |           |           |      |          |  |

| 16   | 06  | 12                                     | E   | N  | NMG1  |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|--|---|--|---|--|---|--------|--------|---|------|--|--|--|----|----|----|--|--|--|--|--|--------|---------|--------|--|------|----|--|--|--|----|----|--|--|-------|--|--|--|-------|-------|--|-----|--|----|--|--|--|--|--|------|----|----|--|--|----|----|----|--|--------|--------|--|--|--------|--------|-------|------|--|--|--|--|--|----|--|--|--|--|--|--|--|--------|--|-----|--|--|----|--|--|--|--|-------|----|----|--|----|----|----|----|--|--------|--------|--|---------|--------|--------|-------|------|--|--|----|--|--|--|--|------|--|--|--|----|--|--|--|-------|----|----|--|----|----|----|----|--|--------|--------|--|--------|--------|--------|--------|--------|----|--|--|----|--|--|--|--|--------|--|--|----------|--|--|--|-------|----|--|--|----|--|--|--|--|--------|--|--|---------|--|--|--|--|--------|--|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|--|--------|--|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|---|----|--|---|---|
| EDGE LENGTH<br>LUNGHEZZA DEL BORDO<br>LONGUEUR D'ARÊTE DE COUPE  | INSERT THICKNESS<br>SPESSORE DELL'INSERTO<br>ÉPAISSEUR DE PLAQUETTE | CORNER RADIUS<br>RAGGIO PUNTA<br>RAYON | CUTTING EDGE<br>TAGLIANTE<br>BORD TRANCHANT | CUTTING DIRECTION<br>DIREZIONE DI TAGLIO<br>DIRECTION DE COUPE | ADDITIONAL CODING<br>INFORMAZIONI SUPPLEMENTARI<br>INFORMATION COMPLÉMENTAIRE |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| <p><b>C</b> </p> <p><b>D</b> </p> <p><b>R</b> </p> <p><b>S</b> </p> <p><b>T</b> </p> <p><b>V</b> </p> <p><b>W</b> </p> <p>(Dimension l in brackets)<br/>(Dimensione l tra parentesi)<br/>(Dimensions l entre parenthèses)</p> <table border="1"> <thead> <tr> <th>d (mm)</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>3,97</td> <td></td> <td></td> <td></td> <td>06</td> <td>07</td> <td>02</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>(6,35)</td> <td>(6,921)</td> <td>(2,70)</td> <td></td> </tr> <tr> <td>5,56</td> <td>05</td> <td></td> <td></td> <td></td> <td>09</td> <td>03</td> <td></td> </tr> <tr> <td></td> <td>(5,6)</td> <td></td> <td></td> <td></td> <td>(9,6)</td> <td>(3,8)</td> <td></td> </tr> <tr> <td>6,0</td> <td></td> <td>06</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6,35</td> <td>06</td> <td>07</td> <td></td> <td></td> <td>11</td> <td>11</td> <td>04</td> </tr> <tr> <td></td> <td>(6,45)</td> <td>(7,75)</td> <td></td> <td></td> <td>(11,0)</td> <td>(11,1)</td> <td>(4,3)</td> </tr> <tr> <td>7,94</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>13</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(13,1)</td> <td></td> </tr> <tr> <td>8,0</td> <td></td> <td></td> <td>08</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9,525</td> <td>09</td> <td>11</td> <td></td> <td>09</td> <td>16</td> <td>16</td> <td>06</td> </tr> <tr> <td></td> <td>(9,67)</td> <td>(11,6)</td> <td></td> <td>(9,525)</td> <td>(16,5)</td> <td>(16,5)</td> <td>(6,5)</td> </tr> <tr> <td>10,0</td> <td></td> <td></td> <td>10</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12,0</td> <td></td> <td></td> <td></td> <td>12</td> <td></td> <td></td> <td></td> </tr> <tr> <td>12,70</td> <td>12</td> <td>15</td> <td></td> <td>12</td> <td>22</td> <td>22</td> <td>08</td> </tr> <tr> <td></td> <td>(12,9)</td> <td>(15,5)</td> <td></td> <td>(12,7)</td> <td>(22,0)</td> <td>(22,1)</td> <td>(8,72)</td> </tr> <tr> <td>15,875</td> <td>16</td> <td></td> <td></td> <td>15</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>(16,1)</td> <td></td> <td></td> <td>(15,875)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>19,05</td> <td>19</td> <td></td> <td></td> <td>19</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>(19,3)</td> <td></td> <td></td> <td>(19,05)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | d (mm)  | C                                      | D   | R  | S   | T      | V      | W | 3,97 |  |  |  | 06 | 07 | 02 |  |  |  |  |  | (6,35) | (6,921) | (2,70) |  | 5,56 | 05 |  |  |  | 09 | 03 |  |  | (5,6) |  |  |  | (9,6) | (3,8) |  | 6,0 |  | 06 |  |  |  |  |  | 6,35 | 06 | 07 |  |  | 11 | 11 | 04 |  | (6,45) | (7,75) |  |  | (11,0) | (11,1) | (4,3) | 7,94 |  |  |  |  |  | 13 |  |  |  |  |  |  |  | (13,1) |  | 8,0 |  |  | 08 |  |  |  |  | 9,525 | 09 | 11 |  | 09 | 16 | 16 | 06 |  | (9,67) | (11,6) |  | (9,525) | (16,5) | (16,5) | (6,5) | 10,0 |  |  | 10 |  |  |  |  | 12,0 |  |  |  | 12 |  |  |  | 12,70 | 12 | 15 |  | 12 | 22 | 22 | 08 |  | (12,9) | (15,5) |  | (12,7) | (22,0) | (22,1) | (8,72) | 15,875 | 16 |  |  | 15 |  |  |  |  | (16,1) |  |  | (15,875) |  |  |  | 19,05 | 19 |  |  | 19 |  |  |  |  | (19,3) |  |  | (19,05) |  |  |  | <br><br><br><table border="1"> <thead> <tr> <th>s [mm]</th> <th>Index<br/>Numero di riferimento<br/>Indicateur</th> </tr> </thead> <tbody> <tr> <td>1.59</td> <td>01</td> </tr> <tr> <td>1.98</td> <td>T1</td> </tr> <tr> <td>2.38</td> <td>02</td> </tr> <tr> <td>3.18</td> <td>03</td> </tr> <tr> <td>3.97</td> <td>T3</td> </tr> <tr> <td>4.76</td> <td>04</td> </tr> <tr> <td>5.56</td> <td>05</td> </tr> <tr> <td>6.35</td> <td>06</td> </tr> <tr> <td>7.94</td> <td>07</td> </tr> <tr> <td>9.52</td> <td>09</td> </tr> </tbody> </table> | s [mm] | Index<br>Numero di riferimento<br>Indicateur | 1.59 | 01 | 1.98 | T1 | 2.38 | 02 | 3.18 | 03 | 3.97 | T3 | 4.76 | 04 | 5.56 | 05 | 6.35 | 06 | 7.94 | 07 | 9.52 | 09 | <br><table border="1"> <thead> <tr> <th>r [mm]</th> <th></th> </tr> </thead> <tbody> <tr> <td>0.2</td> <td>02</td> </tr> <tr> <td>0.4</td> <td>04</td> </tr> <tr> <td>0.8</td> <td>08</td> </tr> <tr> <td>1.2</td> <td>12</td> </tr> <tr> <td>1.6</td> <td>16</td> </tr> <tr> <td>2.4</td> <td>24</td> </tr> <tr> <td>0</td> <td>00</td> </tr> </tbody> </table> <p><b>00: Round insert (inch)</b><br/>00: Inserto tondo (inch)<br/>00 : plaquette ronde (inch)</p> <p><b>MO: Round insert (metric)</b><br/>MO: Inserto tondo (metr.)<br/>MO : plaquette ronde (mètre)</p> | r [mm] |  | 0.2 | 02 | 0.4 | 04 | 0.8 | 08 | 1.2 | 12 | 1.6 | 16 | 2.4 | 24 | 0 | 00 | <p><b>F</b><br/>Sharp<br/>Stelo<br/>Tranchant</p> <p><b>E</b><br/>Rounded<br/>Arrotondato<br/>Arrondi</p> <p><b>T</b><br/>Chamfered<br/>Smussato<br/>Chanfreiné</p> <p><b>S</b><br/>Chamfered and rounded<br/>Smussato e arrotondato<br/>Chanfreiné et arrondi</p> | <p><b>R</b></p><br><p><b>L</b></p><br><p><b>N</b></p> | <p>Special chip breaker shapes are indicated by an internal company code at digit 10.</p> <p>e.g. – NMG<br/>– NA<br/>– ACB</p> <p>Per particolari forme delle canaline formatriciolo nel 10. posto può essere inserito un codice interno della ditta.</p> <p>ad es. – NMG<br/>– NA<br/>– ACB</p> <p>Pour les formes spécifiques de brise-copeaux, un code interne à l'entreprise peut être indiqué au 10e emplacement</p> <p>par ex. – NMG<br/>– NA<br/>– ACB</p> |
| d (mm)   | C   | D                                      | R   | S  | T   | V      | W      |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 3,97   |   |  |   | 06   | 07  | 02     |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  |   |  |   | (6,35)   | (6,921)   | (2,70) |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 5,56   | 05  |  |   |  | 09  | 03     |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (5,6)   |  |   |  | (9,6)   | (3,8)  |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 6,0  |   | 06                                     |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 6,35   | 06  | 07                                     |   |  | 11  | 11     | 04     |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (6,45)  | (7,75)                                 |   |  | (11,0)  | (11,1) | (4,3)  |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 7,94   |   |  |   |  |   | 13     |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  |   |  |   |  |   | (13,1) |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 8,0  |   |  | 08  |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 9,525  | 09  | 11                                     |   | 09   | 16  | 16     | 06     |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (9,67)  | (11,6)                                 |   | (9,525)  | (16,5)  | (16,5) | (6,5)  |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 10,0   |   |  | 10  |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 12,0   |   |  |   | 12   |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 12,70  | 12  | 15                                     |   | 12   | 22  | 22     | 08     |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (12,9)  | (15,5)                                 |   | (12,7)   | (22,0)  | (22,1) | (8,72) |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 15,875   | 16  |  |   | 15   |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (16,1)  |  |   | (15,875)   |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 19,05  | 19  |  |   | 19   |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
|  | (19,3)  |  |   | (19,05)  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| s [mm]   | Index<br>Numero di riferimento<br>Indicateur                        |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 1.59   | 01  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 1.98   | T1  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 2.38   | 02  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 3.18   | 03  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 3.97   | T3  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 4.76   | 04  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 5.56   | 05  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 6.35   | 06  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 7.94   | 07  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 9.52   | 09  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| r [mm]   |   |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 0.2  | 02  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 0.4  | 04  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 0.8  | 08  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 1.2  | 12  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 1.6  | 16  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 2.4  | 24  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |
| 0  | 00  |  |   |  |   |        |        |   |      |  |  |  |    |    |    |  |  |  |  |  |        |         |        |  |      |    |  |  |  |    |    |  |  |       |  |  |  |       |       |  |     |  |    |  |  |  |  |  |      |    |    |  |  |    |    |    |  |        |        |  |  |        |        |       |      |  |  |  |  |  |    |  |  |  |  |  |  |  |        |  |     |  |  |    |  |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |         |        |        |       |      |  |  |    |  |  |  |  |      |  |  |  |    |  |  |  |       |    |    |  |    |    |    |    |  |        |        |  |        |        |        |        |        |    |  |  |    |  |  |  |  |        |  |  |          |  |  |  |       |    |  |  |    |  |  |  |  |        |  |  |         |  |  |  |  |        |  |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |  |        |  |     |    |     |    |     |    |     |    |     |    |     |    |   |    |  |   |   |

# HC - SOLID CARBIDE COATED

## HC - METALLO DURO RIVESTITO

### HC - CARBURE AVEC REVÊTEMENT

## AL10

- Specially suitable for very high cutting speeds
- High coating hardness
- Extremely high wear resistance
- Particolarmente adatta per velocità di taglio molto elevate
- Elevata durezza del rivestimento
- Resistenza all'usura particolarmente elevata
- Particulièrement adapté pour les vitesses de coupe très élevées
- Dureté de revêtement élevée
- Résistance à l'usure extrêmement haute

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AL20

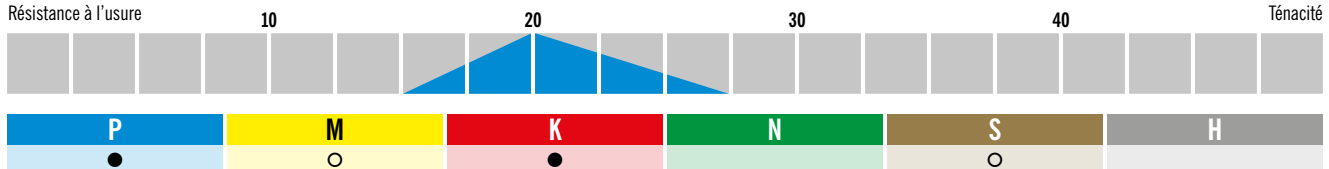
- For steel, grey cast iron and stainless steel
- High wear resistance and coating hardness
- Good cutting edge stability
- Per acciaio, ghisa grigia e acciaio inossidabile
- Elevata resistenza all'usura e durezza di rivestimento
- Buona stabilità del tagliente
- Pour l'acier, la fonte grise et l'acier inoxydable
- Grande résistance à l'usure et dureté de revêtement
- Bonne stabilité des bords tranchants

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

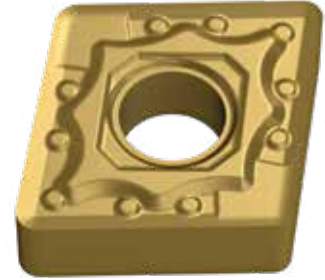
Toughness  
Tenacità  
Ténacité



# AP2025

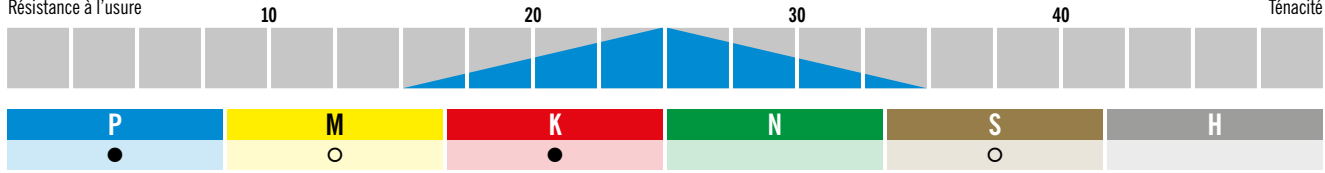
- Universal grade for steel and cast materials
- High degree of toughness
- High wear resistance
- *Qualità universale per acciai e materiali colati*
- *Elevata tenacità*
- *Elevata resistenza all'usura*
- Nuances universelles pour les aciers courants et les fontes
- Ténacité élevée
- Grande résistance à l'usure

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AP2035

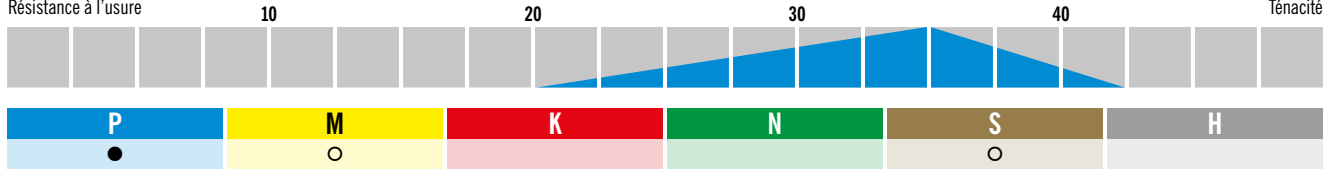
- For poor conditions and interrupted cuts
- For unstable conditions or poor material surface conditions
- Extremely high degree of toughness and good wear resistance
- *Per condizioni sfavorevole come tagli interrotti*
- *Per condizioni instabili o superfici dei materiali non ottimali*
- *Tenacità particolarmente elevata e buona resistenza all'usura*
- Pour les conditions difficiles comme les coupes interrompues
- Pour les situations instables ou les surfaces de matériaux non optimales
- Ténacité extrêmement élevée et bonne résistance à l'usure

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

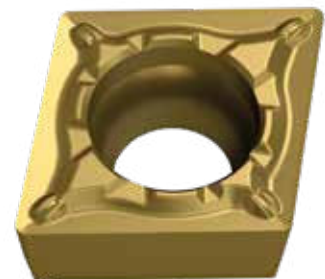
Toughness  
Tenacità  
Ténacité



# AP2110

- For the high-speed machining of steel
- Suitable for roughing grey cast iron and nodular cast iron
- Maximum safety even under extreme conditions
- *Per la lavorazione ad alta velocità dell'acciaio*
- *Adatto per la sgrossatura di ghisa grigia ghisa sferoidale*
- *Massima sicurezza anche in condizioni estreme*
- Pour l'usinage « grande vitesse » de l'acier
- Convient pour l'ébauche de la fonte grise et de la fonte à graphite sphéroïdal
- Sécurité optimale même à des conditions extrêmes

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



4

# AP2310

- Main grade for finishing steel
- High wear resistance
- Long tool life
- *Prima scelta per lavorazione dell'acciaio nella finitura*
- *Elevata resistenza all'usura*
- *Elevata durata*
- Nuance principale pour l'usinage d'acier en phase de finition
- Grande résistance à l'usure
- Grande durée de vie

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AP2320

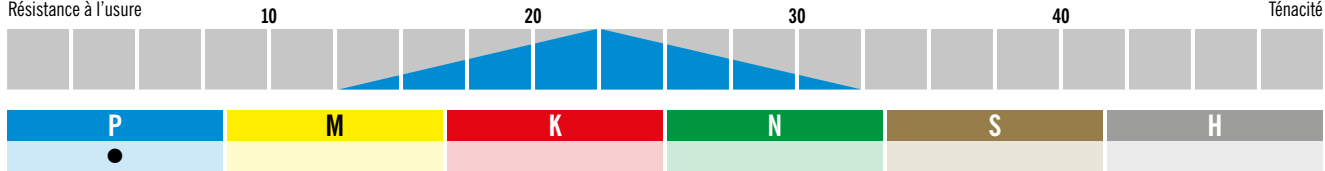
- Main grade for medium machining of steel
- Stable against plastic deformation
- High tensile strength
- *Prima scelta per lavorazione media dell'acciaio*
- *Stabile contro la deformazione plastica*
- *Elevata resistenza alla rottura*
- Nuance principale pour l'usinage d'acier en phase de semi-finition
- Stabilité face à la déformation plastique
- Grande résistance à la rupture

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

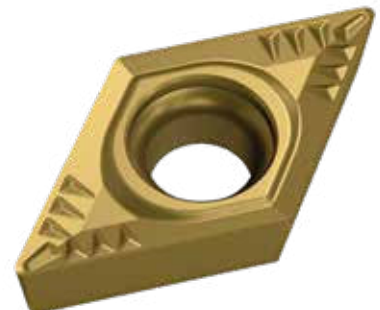
Toughness  
Tenacità  
Ténacité



# AP2335

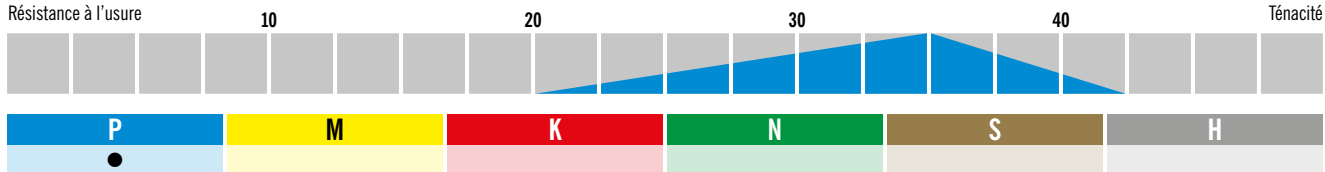
- Main grade for roughing steel
- Extremely tough grade
- For interrupted cuts and poor machining conditions
- *Prima scelta per lavorazione dell'acciaio nella sgrossatura*
- *Qualità particolarmente tenace*
- *Per tagli interrotti e condizioni sfavorevoli*
- Nuance principale pour l'usinage d'acier en phase d'ébauche
- Nuance extrêmement dure
- Pour des coupes interrompues et des conditions difficiles

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AP2420

- Universal grade for steel and cast materials
- High degree of toughness
- High wear resistance
- Qualità di metallo duro per la lavorazione dell'acciaio
- Attrito ridotto e usura diminuita
- Tagliente robusto e stabile per la lavorazione di sgrossatura
- Nuance de carbure pour l'usinage d'acier
- Friction et usure réduites
- Bord tranchant robuste et stable pour l'ébauche

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AP5210

- For finish machining steel and stainless steels
- High resistance to abrasive wear
- Also suitable for materials of the K and S groups
- Prima scelta per la finitura di acciaio e acciaio inossidabile
- Elevata resistenza all'usura con taglio molto positivo
- Idonea anche per materiali del gruppo K ed S
- Pour l'usinage de précision de l'acier et des aciers inoxydables
- Résistance élevée à l'abrasion
- Fonctionne également avec des matériaux des groupes K et S

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM15C

- For finish machining
- For high cutting speeds in good machining conditions
- Not suitable for non-ferrous metals
- Per la lavorazione di finitura
- Per elevate velocità di taglio in buone condizioni di lavorazione
- Non adatto per metalli non ferrosi
- Pour l'usinage de finition
- Pour des vitesses de coupe élevées dans de bonnes conditions d'usinage
- Ne convient pas aux métaux non ferreux

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM2030

- Extremely high toughness
- Very good wear resistance
- Very good chip evacuation
- *Tenacità estremamente elevata*
- *Ottima resistenza all'usura*
- *Ottimo comportamento di scorrimento del truciolo*
- *Ténacité extrêmement élevée*
- *Très bonne résistance à l'usure*
- *Très bon comportement de glissement du copeau*

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM2035

- For machining austenitic stainless steel and high-temperature resistant alloys that are difficult to cut
- Very good wear resistance
- High degree of toughness
- *Per acciai inossidabili austenitici, difficili da lavorare e per leghe resistenti al calore*
- *Ottima resistenza all'usura*
- *Elevata tenacità*
- *Pour les aciers inoxydables austénitiques, difficiles à usiner et les alliages réfractaires*
- *Très bonne résistance à l'usure*
- *Ténacité élevée*

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM2110

- For finish machining stainless steel
- Long tool life and wear resistance
- Very hard microfine coating
- *Per la lavorazione di finitura di acciaio inossidabile*
- *Elevata durata e resistenza all'usura*
- *Rivestimento molto duro e microfine*
- *Pour la finition d'acier inoxydable*
- *Longue durée de vie et grande résistance à l'usure*
- *Revêtement très dur et extrêmement fin*

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité





# AM2130

- For medium and heavy machining of stainless steel
- Long tool life and wear resistance
- Suitable for interrupted cuts
- *Per la lavorazione media e pesante di acciaio inossidabile*
- *Elevata durata e resistenza all'usura*
- *Adatto a tagli interrotti*
- Pour l'usinage moyen et difficile de l'acier inoxydable
- Longue durée de vie et grande résistance à l'usure
- Convient pour les coupes interrompues

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM25C

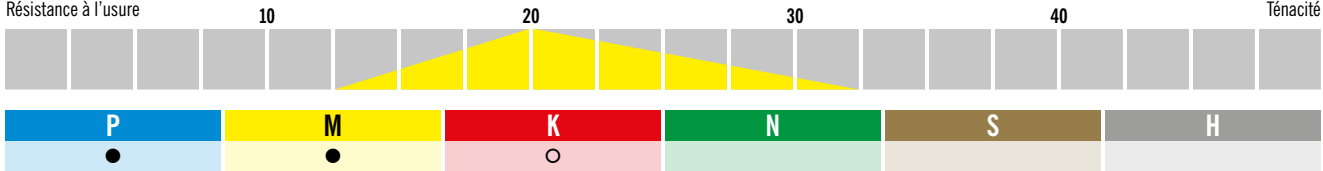
- For finish machining and medium machining steel and cast steel
- Suitable for varying cutting depths
- Medium cutting speeds
- *Per la finitura e la lavorazione media di acciai inossidabili e getti di acciaio*
- *Adatto per profondità di taglio variabili*
- *Per velocità di taglio medie*
- Pour l'usinage de finition et de semi-finition de l'acier et de l'acier coulé
- Convient pour des profondeurs de coupe variables
- Vitesses de coupe moyennes

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM350

- For medium to high cutting speeds
- Good wear resistance and very good toughness
- Suitable for poor machining conditions
- *Per velocità di taglio medie ed elevate*
- *Buona resistenza all'usura e ottima tenacità*
- *Adatto per condizioni di lavorazione sfavorevoli*
- Pour des vitesses de coupe moyennes à élevées
- Bonne résistance à l'usure et très bonne ténacité
- Convient pour des conditions d'usinage difficiles

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité





## AM35C

- For medium to high cutting speeds
- Good wear resistance and toughness
- Suitable for poor machining conditions
- *Per velocità di taglio medie ed elevate*
- *Buona resistenza all'usura e tenacità*
- *Adatto per condizioni di lavorazione sfavorevoli*
- Pour des vitesses de coupe moyennes à élevées
- Bonnes résistance à l'usure et ténacité
- Convient pour des conditions d'usinage difficiles

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AM5015

- Universally applicable type
- Good wear resistance
- Good cutting edge stability
- *Qualità universale*
- *Buona resistenza all'usura*
- *Buona robustezza del tagliente*
- Nuance à usage universel
- Bonne résistance à l'usure
- Bonne sécurité des bords tranchants

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AM5020

- For finish machining stainless and heat resistant steels
- High degree of toughness and good wear resistance
- Ideal for precision turning difficult materials
- *Per la finitura di acciai inossidabili e resistenti alle alte temperature*
- *Elevata tenacità e buona resistenza all'usura*
- *Ottimale per la tornitura di finitura di materiali difficili da lavorare*
- Pour l'usinage de finition d'aciers inoxydables et résistants à la chaleur
- Ténacité élevée et bonne résistance à l'usure
- Idéal pour le tournage de précision de matériaux difficiles

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5025

- For finish and medium machining
- Very good toughness and good wear resistance
- Suitable for varying cutting depths and interrupted cuts
- Per la lavorazione di finitura e per la lavorazione media
- Ottima tenacità e buona resistenza all'usura.
- Adatto per profondità di taglio variabili e tagli interrotti
- Pour l'usinage en phase de finition et semi-finition
- Très bonne ténacité et bonne résistance à l'usure
- Convient pour des profondeurs de coupe variables et des coupes interrompues

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5110

- Well suited for materials of the M and S group
- High resistance to abrasive wear
- Best grade for finish machining
- Adatto per materiali dei gruppi M e S
- Elevata resistenza contro l'usura per abrasione
- Qualità specifica per la finitura
- Convient bien pour des matériaux des groupes M et S
- Résistance élevée à l'abrasion
- Nuance optimale pour l'usinage de précision

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5120

- For rough machining stainless steels
- Also highly suitable for exotic materials
- Also applicable to heat resistant alloys
- Per la lavorazione di sgrossatura di acciai inossidabili
- Particolarmente adatto anche per materiali esotici
- Utilizzabile anche per leghe resistenti al calore
- Pour l'ébauche d'aciers inoxydables
- Convient aussi particulièrement pour les matériaux exotiques
- Peut également être utilisé avec des alliages résistants à la chaleur

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5120+

- For medium and rough machining
- High cutting edge stability
- Suitable for super alloys
- Per la lavorazione media e la sgrossatura
- Elevata stabilità del tagliente
- Adatto per le superleghe
- Pour l'usinage de semi-finition et d'ébauche
- Grande stabilité des bords tranchants
- Convient pour des superalliages

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5130

- For medium machining stainless steels
- Also suitable for exotic materials
- Universal grade
- Per la lavorazione media di acciai inossidabili
- Adatto anche per materiali esotici
- Qualità universale
- Pour l'usinage moyen d'aciers inoxydables
- Convient aussi pour des matériaux exotiques
- Nuance universelle

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5220

- For machining steel, cast steel and stainless steels
- Also suitable for machining super alloys
- High wear resistance
- Per la lavorazione di acciai, getti di acciaio e acciai inossidabili
- Adatto anche per la lavorazione di superleghe
- Elevata resistenza all'usura
- Pour l'usinage d'aciers, d'acier coulé et d'aciers inoxydables
- Convient également à l'usinage de superalliages
- Grande résistance à l'usure

PVD



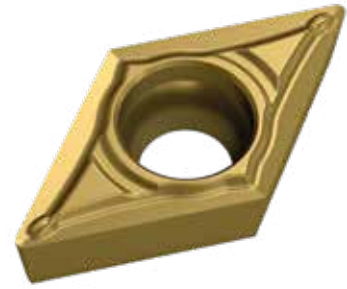
Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AK2110

- Stable grade for machining cast iron
- Excellent wear resistance
- Good resistance to edge build-up
- *Varietà stabile per la lavorazione della ghisa*
- *Eccellente resistenza all'usura*
- *Ridotta tendenza alla formazione di tagliente di riporto*
- Nuance stable pour l'usinage de la fonte
- Excellente résistance à l'usure
- Inclinaison faible par rapport à la formation d'arêtes de coupe



# AK2310

- Universal application for materials of the K group
- Excellent wear resistance
- Good resistance to edge build-up
- *Impiego universale con i materiali del gruppo K*
- *Eccellente resistenza all'usura*
- *Ridotta tendenza alla formazione di tagliente di riporto*
- Emploi universel avec des matériaux du groupe K
- Excellente résistance à l'usure
- Inclinaison faible par rapport à la formation d'arêtes de coupe



# AK2320

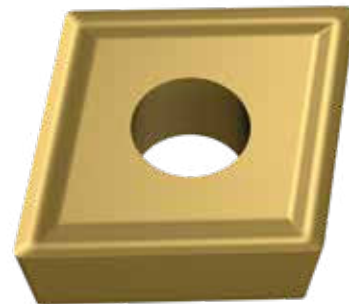
- Universal application for materials of the K group
- High wear resistance
- Suitable for interrupted cuts
- *Impiego universale con i materiali del gruppo K*
- *Elevata resistenza all'usura*
- *Adatto per tagli interrotti*
- Emploi universel avec des matériaux du groupe K
- Grande résistance à l'usure
- Convient pour des coupes interrompues



4

# AR27C

- For stable machining conditions
- High wear resistance
- High cutting speeds
- Per condizioni di lavorazione stabile
- Elevata resistenza all'usura
- Elevate velocità di taglio
- Pour des conditions d'usinage stables
- Grande résistance à l'usure
- Vitesses de coupe élevées



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



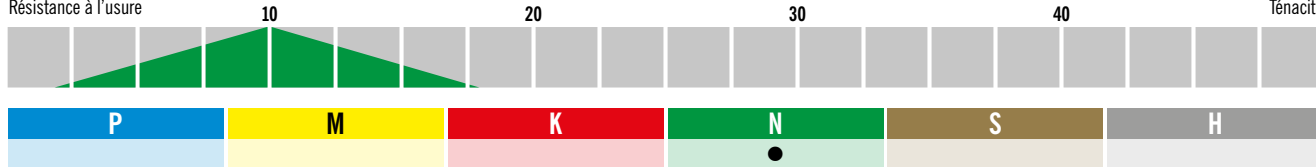
# AD2

- For good machining conditions
- Diamond coated
- Very long tool life
- Per condizioni di lavorazione favorevoli
- Rivestito in diamante
- Durante molto elevate
- Pour des conditions d'usinage favorables
- À revêtement diamant
- Très grande durée de vie



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AT10

- For stable machining conditions
- High wear resistance
- For machining non-ferrous metals
- Per condizioni di lavorazione stabile
- Elevata resistenza all'usura
- Lavorazione di metalli non ferrosi
- Pour des conditions d'usinage stables
- Grande résistance à l'usure
- Usinage de métaux non ferreux



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AT20

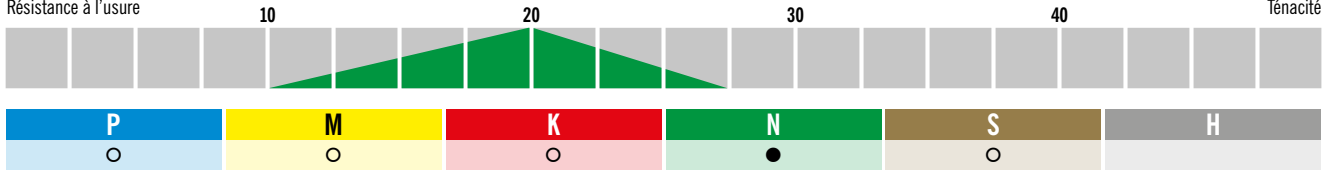
- For machining non-ferrous metals
- High degree of toughness
- Suitable for poor machining conditions
- *Per la lavorazione di metalli non ferrosi*
- *Elevata tenacità*
- *Adatto per condizioni di lavorazione sfavorevoli*
- Pour l'usinage de métaux non ferreux
- Ténacité élevée
- Convient pour des conditions d'usinage difficiles

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

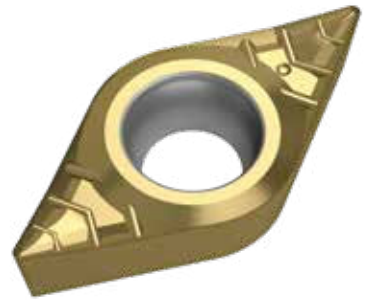
Toughness  
Tenacità  
Ténacité



# PVD1

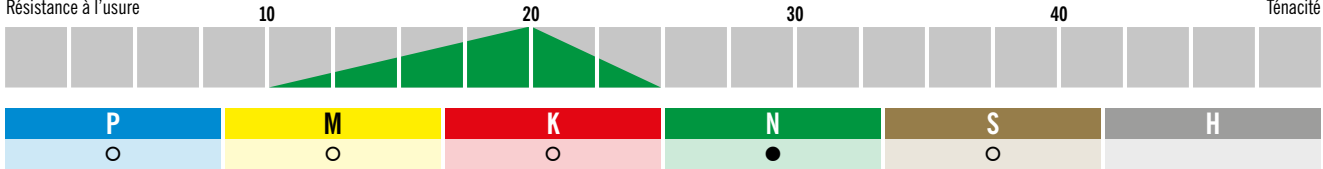
- Specially for machining non-ferrous metals
- High wear resistance
- Good resistance to plastic deformation
- *Specialmente adatto alla lavorazione di metalli non ferrosi*
- *Elevata resistenza all'usura*
- *Buona resistenza alla deformazione plastica*
- Spécialement conçu pour l'usinage de métaux non ferreux
- Grande résistance à l'usure
- Grande résistance à la déformation plastique

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# PVD2

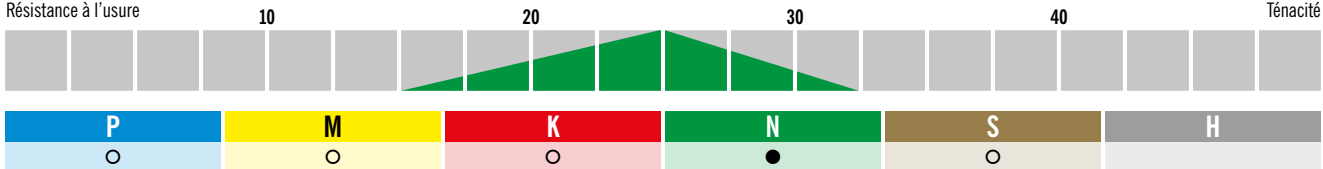
- For machining non-ferrous metals in poor conditions
- High wear resistance
- Good cutting edge stability
- *Lavorazione di metalli non ferrosi in condizioni sfavorevoli*
- *Elevata resistenza all'usura*
- *Buona sicurezza del tagliente*
- Usinage de métaux non ferreux dans des conditions défavorables
- Grande résistance à l'usure
- Bonne sécurité des bords tranchants

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité

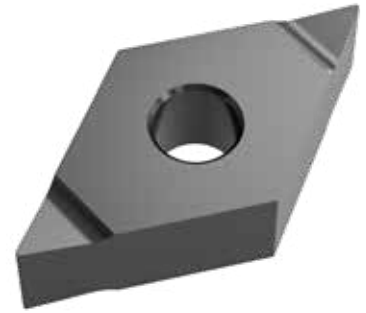


4

## AH4205

- Specially for hard machining
- Excellent wear and temperature resistance
- Very long tool life compared to previous cutting materials
- *Particolarmente adatto alla lavorazione di materiali duri*
- *Eccellente resistenza all'usura e alla temperatura*
- *Ottima durata rispetto ai comuni gradi di metallo duro*
- Spécialement conçu pour l'usinage dur
- Excellente résistance à l'usure et à la température
- Longue durée de vie par rapport aux matériaux de coupe utilisés jusqu'à présent

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# HU - SOLID CARBIDE UNCOATED

## HU - METALLO DURO NON RIVESTITO

### HU - CARBURE SANS REVÊTEMENT

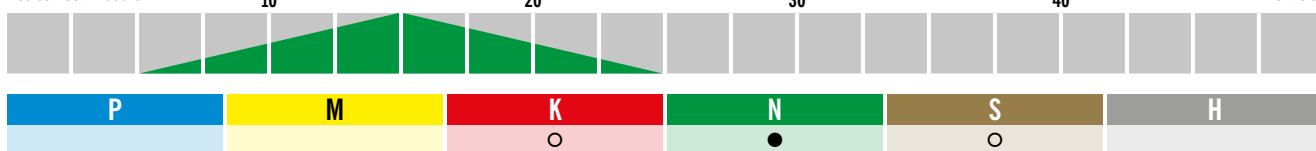
## AK10

- Also suitable for titanium and titanium alloys
- For good machining conditions
- Wear-resistant base substrate
- Adatto anche per titanio e leghe di titanio
- Per buone condizioni di lavorazione
- Substrato di base resistente all'usura
- Convient aussi pour le titane et les alliages de titane
- Pour de bonnes conditions d'usinage
- Substrat de base résistant à l'usure



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



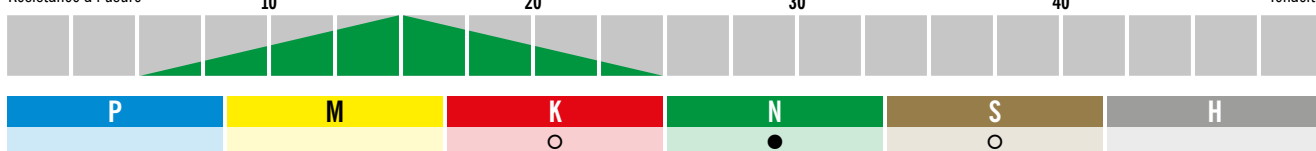
## AK1010

- For machining all materials in the N group
- Also suitable for super alloys and cast iron
- For good machining conditions
- Per la lavorazione di tutti i materiali del gruppo N
- Adatto anche per superleghe e ghisa
- Per buone condizioni di lavorazione
- Pour l'usinage de tous les matériaux du groupe N
- Convient aussi pour les superalliages et la fonte
- Pour de bonnes conditions d'usinage



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité





# AK1020

- For finish machining
- Well suited for non-ferrous metals
- For smooth cut or slightly varying cutting depths
- Per la lavorazione di finitura
- Adatto per metalli non ferrosi
- Per taglio costante o profondità di taglio leggermente variabili
- Pour l'usinage de finition
- Convient bien aux métaux non ferreux
- Pour une coupe nette ou des profondeurs de coupe légèrement variables



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AK20

- Well suited for poor machining conditions
- Well suited for cast iron metals
- Good degree of toughness
- Adatto per condizioni di lavorazione sfavorevoli
- Adatto per fusioni di ghise
- Buona tenacità
- Convient bien pour des conditions d'usinage défavorables
- Convient bien aux fontes
- Bonne ténacité



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AS1010

- Very well suited for machining high-temperature resistant alloys
- For machining super alloys
- Excellent wear resistance
- La soluzione ottimale per la lavorazione di leghe resistenti al calore
- Lavorazione di superleghe
- Eccellente resistenza all'usura
- Convient très bien pour l'usinage d'alliages réfractaires
- Usinage de superalliages
- Excellente résistance à l'usure



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



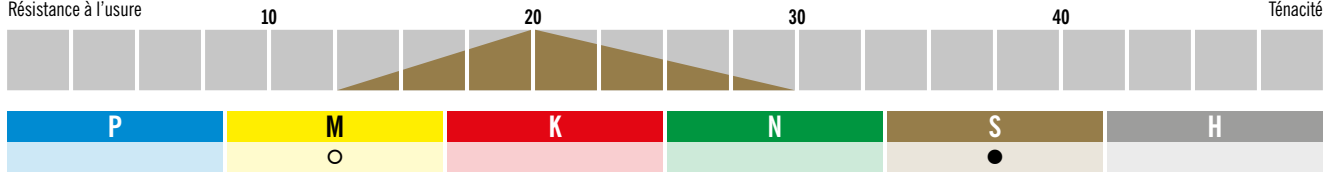
# AS1020

- Very well suited for machining high-temperature resistant alloys
- For machining super alloys
- **Good interplay between wear resistance and toughness**
- *Convient très bien pour l'usinage d'alliages réfractaires*
- *Usinage de superalliages*
- *Rapport équilibré entre la résistance à l'usure et la ténacité*
- La soluzione ottimale per la lavorazione di leghe resistenti al calore
- Lavorazione di superleghe
- Buona interazione tra resistenza all'usura e tenacità



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## CC - CERMET COATED

### CC - CERMET RIVESTITO

### CC – CERMET AVEC REVÊTEMENT

#### AP6510

- High cutting speeds
- Long tool life
- Good wear resistance
- *Elevate velocità di taglio*
- *Elevata durata*
- *Buona resistenza all'usura*
- *Vitesses de coupe élevées*
- *Grande durée de vie*
- *Bonne résistance à l'usure*

PVD



Wear resistance  
*Resistenza all'usura*  
Résistance à l'usure

Toughness  
*Tenacità*  
Ténacité



#### AC90C

- For finish and medium machining
- Good degree of toughness and wear resistance
- Good resistance to edge build-up
- *Per la lavorazione di finitura e per la lavorazione media*
- *Buona tenacità e resistenza all'usura*
- *Ridotta tendenza alla formazione di taglienti di riporto*
- *Pour l'usinage en phase de finition et semi-finition*
- *Bonnes ténacité et résistance à l'usure*
- *Inclinaison faible par rapport à la formation d'arêtes de coupe*

PVD



Wear resistance  
*Resistenza all'usura*  
Résistance à l'usure

Toughness  
*Tenacità*  
Ténacité



**CU - CERMET UNCOATED**  
**CU – CERMET NON RIVESTITO**  
**CC – CERMET SANS REVÊTEMENT**

4

**ACE6**

- For medium cutting speeds
- Resistant to oxidation and flank wear
- Good resistance to edge build-up
- Per velocità di taglio medie
- Resistente all'ossidazione e all'usura da intaglio
- Ridotta tendenza alla formazione di taglienti
- Pour des vitesses de coupe moyennes
- Résistance à l'oxydation et à l'usure en entaille
- Inclinaison faible par rapport à la formation d'arêtes de coupe



**AP6010**

- High cutting speeds
- Long tool life
- Good wear resistance
- Elevate velocità di taglio
- Elevata durata
- Buona resistenza all'usura
- Vitesses de coupe élevées
- Grande durée de vie
- Bonne résistance à l'usure



**NEGATIVE FINISHING**  
**FINITURA NEGATIVA**  
**FINITION NÉGATIVE**

**-AQ**

- Very good chip control
- High surface quality and tolerance accuracy
- Universal geometry
- *Ottima formazione del truciolo*
- *Elevata qualità di finitura e precisione di tolleranza*
- *Geometria universale*
- Très bonne formation de copeaux
- Qualité de surface et précision de tolérance élevées
- Géométrie universelle



double sided  
 bilaterale  
 des deux côtés



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   |   |  |   |

**-EX**

- Ground periphery
- For light machining
- For small to medium cutting depths and feed rates
- *Rettificato lungo il profilo*
- *Per basse asportazioni*
- *Per profondità di taglio e avanzamenti piccoli o medi*
- Rectifié
- Pour l'usinage léger
- Pour des profondeurs de coupe et avances de petite taille à taille moyenne



double sided  
 bilaterale  
 des deux côtés



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ○  | ● | ○   | ● | ●  |   |

# -NFS

- Specially for machining hardened steels
- Very good chip evacuation
- Improved chip breaking
- *Particolarmente adatto per la lavorazione di acciai temprati*
- *Ottima evacuazione dei trucioli*
- *Migliorata rottura dei trucioli*
- Spécialement conçu pour l'usinage d'aciers trempés
- Très bonne évacuation des copeaux
- Fragmentation améliorée des copeaux



double sided  
bilaterale  
des deux côtés



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
|                                   |   |  |   |   | ● |

# -NFT

- For light machining
- For exotic materials and high-temperature resistance titanium nickel alloys
- Very good chip breaking
- *Per finitura*
- *Per materiali esotici e leghe di titanio-nichel resistenti al calore*
- *Ottima rottura del truciolo*
- Pour l'usinage léger
- Pour les matériaux exotiques et les alliages de nickel et de titane réfractaires
- Très bonne fragmentation des copeaux



double sided  
bilaterale  
des deux côtés



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ○                                 | ● |  |   | ●   |   |

# -NS1

- Universal geometry
- Well suited for machining steel and stainless materials
- Good chip formation
- *Geometria universale*
- *Adatto per la lavorazione di acciaio e materiali inossidabili*
- *Buona formazione del truciolo*
- Géométrie universelle
- Convient très bien pour l'usinage de l'acier et des matériaux inoxydables
- Bonne formation des copeaux



double sided  
bilaterale  
des deux côtés

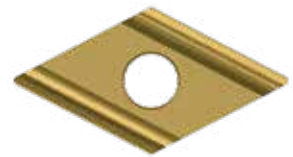


|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ○  |   |   |   |

**NEGATIVE FINISHING TO MEDIUM MACHINING**  
**FINITURA NEGATIVA E LAVORAZIONE MEDIA**  
**DE LA FINITION NÉGATIVE À L'USINAGE DE SEMI-FINITION**

**-K**

- Very soft cutting geometry
- First choice for long, thin workpieces
- Universal application for finishing and medium machining
- *Geometria dal taglio dolce*
- *Prima scelta per i pezzi in lavorazione lunghi e sottili*
- *Utilizzabile universalmente nella finitura e nella lavorazione media*
- Géométrie à coupe très douce
- Premier choix pour les pièces longues et fines
- Usage universel en phase de finition et semi-finition



double sided  
bilaterale  
des deux côtés



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● |   |   |  |   |

## NEGATIVE MEDIUM MACHINING

LAVORAZIONE MEDIA  
NEGATIVA

USINAGE DE SEMI-FINITION  
NÉGATIVE

### -NA

- For machining steel at medium cutting depths and feed rates
- Wide geometry range for strongly varying cutting depths
- Low cutting forces
- Per la lavorazione di acciaio con profondità di taglio e avanzamenti medi
- Ampia gamma di geometria per profondità di taglio fortemente variabili
- Ridotta forza di taglio
- Pour l'usinage de l'acier à des profondeurs de passe et des avances moyennes
- Grande plage de géométrie pour des profondeurs de passe fortement variables
- Faible pression de coupe



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ○ | ●  |   |   | ○ |

### -NM2

- Chip pimples to optimise chip evacuation
- Very good cutting edge stability
- Very well suited for medium machining of steel
- Nodi per la formazione di trucioli che garantiscono un flusso di truciolatura ottimizzato
- Ottima stabilità del tagliente
- Adatto particolarmente per la lavorazione media di acciaio
- Brise-copeaux pour un débit optimisé des copeaux
- Très bonne stabilité des bords tranchants
- Convient très bien pour l'usinage en phase de semi-finition de l'acier



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ○  | ○ | ●   | ○ |

# 4



# -NMR

- Sharp cutting edge
- Suitable for materials difficult to machine
- Reverse geometry
- Tagliente affilato
- Adatto per materiali difficili da lavorare
- Prima scelta per acciai inossidabili
- Tagliente affilato
- Adatto per materiali difficili da lavorare
- Geometria su lato posteriore



double sided  
bilaterale  
des deux côtés



|                                   |        |  |        |        |   |  |
|-----------------------------------|--------|--|--------|--------|---|--|
| Finishing<br>Finitura<br>Finition |        | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |        |        | Rough machining<br>Sgrossatura<br>Ébauche |  |
| P<br>○                            | M<br>● | K<br>○   | N<br>● | S<br>● | H<br>○                                    |  |

# -VA

- For small to medium cutting depths and feed rates
- Low cutting forces
- Sharp cutting edge
- Per profondità di taglio e avanzamenti piccoli o medi
- Ridotta forza di taglio
- Tagliente affilato
- Pour des profondeurs de coupe et avances de plus petite taille à taille moyenne
- Faibles pressions de coupe
- Bord tranchant



double sided  
bilaterale  
des deux côtés



|                                   |        |  |        |        |   |  |
|-----------------------------------|--------|--|--------|--------|---|--|
| Finishing<br>Finitura<br>Finition |        | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |        |        | Rough machining<br>Sgrossatura<br>Ébauche |  |
| P<br>●                            | M<br>● | K<br>○   | N<br>● | S<br>● | H<br>○                                    |  |

# NEGATIVE MEDIUM MACHINING TO ROUGHING

LAVORAZIONE MEDIA NEGATIVA E LAVORAZIONE DI SGROSSATURA

USINAGE DE SEMI-FINITION NÉGATIVE JUSQU'À L'ÉBAUCHE

**-A**

- Excellent for roughing
- Machining of steel and stainless steel
- Medium to large chip cross-sections
- *Adatto in maniera eccellente per la sgrossatura*
- *Lavorazione di acciaio e acciaio inossidabile*
- *Sono possibili sezioni dei trucioli medi o grandi*
- Convient remarquablement bien pour l'ébauche
- Usinage de l'acier et de l'acier inoxydable
- Sections de copeaux moyennes à grandes possibles



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ● |  |   |   |   |

4

**-N11**

- Excellent for copy turning
- For machining steel and cast iron
- Medium to large chip cross-sections
- *Specifico per la tornitura di copiatura*
- *Lavorazione di acciaio e ghisa*
- *Sono possibili sezioni dei trucioli medi o grandi*
- Convient remarquablement bien pour le copiage
- Usinage de l'acier et de la fonte
- Sections de copeaux moyennes à grandes possibles



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ○  |   |   |   |

# -NMT

- For exotic materials and high-temperature resistance titanium nickel alloys
- Excellent chip control
- Reliable results
- *Per materiali esotici e leghe di titanio-nichel resistenti al calore*
- *Eccellente controllo del truciolo*
- *Prestazioni costanti*
- Pour les matériaux exotiques et les alliages de nickel et de titane réfractaires
- Contrôle exceptionnel des copeaux
- Résultats fiables



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
|                                   | ● |  |   | ● |   |  |

# -NMT1

- For exotic materials and high-temperature resistance titanium nickel alloys
- Reliable chip formation
- Good chip control
- *Per materiali esotici e leghe di titanio-nichel resistenti al calore*
- *Formazione del truciolo sicura*
- *Buon controllo del truciolo*
- Pour les matériaux exotiques et les alliages de nickel et de titane réfractaires
- Formation des copeaux dans une grande sécurité de processus
- Bon contrôle des copeaux



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
|                                   | ● |  |   | ● |   |  |

# NEGATIVE ROUGH MACHINING

LAVORAZIONE DI SGROSSATURA NEGATIVA  
ÉBAUCHE NÉGATIVE

## -NMG1

- Universal geometry
- For rough machining steel, stainless steel and cast iron
- Good chip control
- Geometria universale
- Lavorazione di sgrossatura di acciaio, acciaio inossidabile e ghisa
- Buon controllo del truciolo
- Géométrie universelle
- Ébauche de l'acier, de l'acier inoxydable et de la fonte
- Bon contrôle des copeaux



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ●  | ○ | ●   | ○ |

## -NR1

- For rough machining steel and stainless steels
- Pimple chip breaker
- Very stable cutting edge
- Lavorazione di sgrossatura di acciaio e acciai inossidabili
- Rompitruciolo ottimizzato
- Tagliente molto stabile
- Ébauche de l'acier et des aciers inoxydables
- Brise-copeaux
- Bord tranchant très stable



double sided  
bilaterale  
des deux côtés



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ●  | ○ | ●   | ○ |

# POSITIVE FINISH MACHINING

FINITURA POSITIVA

FINITION POSITIVE

## -EN-AEC

- Excellent for machining steel and stainless steel
- Rounded cutting edge for minimum cutting forces
- High process reliability
- *Prima scelta per la lavorazione di acciaio e acciai inossidabili*
- *Tagliente arrotondato per ridurre al minimo la forza di taglio*
- *Elevata sicurezza di lavorazione*
- Convient parfaitement pour l'usinage de l'acier et des aciers inoxydables
- Bord tranchant arrondi pour des pressions de coupe minimales
- Grande sécurité de processus



single sided  
su un lato  
d'un côté



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ○                                 | ● | ○  | ● |   |   |

## -FN-AEC

- Excellent for machining steel and stainless steel
- Sharp cutting edge
- Good resistance to edge build-up
- *Prima scelta per la lavorazione di acciaio e acciai inossidabili*
- *Tagliente affilato*
- *Ridotta tendenza alla formazione di taglienti di riporto*
- Convient parfaitement pour l'usinage de l'acier et des aciers inoxydables
- Bord tranchant
- Inclinazione faible par rapport à la formation d'arêtes de coupe



single sided  
su un lato  
d'un côté



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ○                                 | ● | ○  | ● |   |   |

# -FS

- Ground chip breaker
- Low cutting force
- Good chip control, optimised chip evacuation
- *Rompitruciolo rettificato*
- *Ridotta forza di taglio*
- *Buon controllo del truciolo, evacuazione del truciolo ottimizzata*
- Brise-copeaux rectifié
- Faible pression de coupe
- Bon contrôle des copeaux, évacuation optimisée des copeaux



single sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   |   |  |   |

# -PF2

- Ground geometry
- Sharp cutting edge
- Polishing insert surface
- *Geometria rettificata*
- *Taglienti affilati*
- *Superficie lappata*
- Géométrie rectifiée
- Arêtes de coupe tranchantes
- Surface polie



single sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   | ● | ●  | ○ |

# -PS2

- High surface quality and tolerance accuracy
- Chip breaker for controlled chip breaking
- Sharp cutting edge
- *Elevate finiture superficiali e precisione di tolleranza*
- *Rompitruciolo per la rottura controllata dei trucioli*
- *Tagliente affilato*
- Précisions de tolérance et états de surface élevés
- Brise-copeaux pour une fragmentation contrôlée des copeaux
- Arêtes de coupe tranchantes



single sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   | ○ | ●  |   |

**POSITIVE FINISHING TO MEDIUM MACHINING**  
**FINITURA POSITIVA E LAVORAZIONE MEDIA**  
**DE LA FINITION POSITIVE À L'USINAGE DE SEMI-FINITION**

**-AQ**

- High surface quality and tolerance accuracy
- Very good chip control
- Universal geometry
- *Elevata qualità superficiale e precisione di tolleranza*
- *Ottima formazione del truciolo*
- *Geometria universale*
- Qualité de surface et précision de tolérance élevées
- Très bonne formation de copeaux
- Géométrie universelle



single sided  
 su un lato  
 d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   |   |  |   |

**-AY**

- Sharp cutting edge
- High surface quality
- For steel and stainless steels
- *Tagliente affilato*
- *Elevate finiture superficiali*
- *Adatto per acciaio e acciai inossidabili*
- Arêtes de coupe tranchantes
- États de surface élevés
- Convient pour l'acier et les aciers inoxydables



single sided  
 su un lato  
 d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ○   |   |  |   |

# -AZ

- For machining steel, cast steel and stainless steels
- Ground geometry
- Peripheral chip breaker
- Per la lavorazione dell'acciaio, dell'acciaio fuso e degli acciai inossidabili
- Geometria rettificata
- Canale romptruciolo sulla circonferenza
- Pour l'usinage d'acier, d'acier coulé et d'aciers inoxydables
- Géométrie rectifiée
- Brise-copeaux périphérique



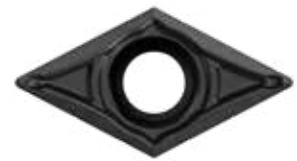
single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ○  | ○ | ● | ○   |  |

# -PM1

- High process reliability
- Excellent chip control
- Specially for machining steel and stainless steels
- Elevata sicurezza di lavorazione
- Eccellente controllo della truciolatura
- Particolarmente adatto per la lavorazione di acciaio e di acciai inossidabili
- Grande sécurité de processus
- Excellent contrôle des copeaux
- Convient particulièrement pour l'usinage d'acier et d'aciers inoxydables



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ●  | ○ | ● | ○   |  |

# -PMC

- For machining steel and cast steel
- Good chip evacuation
- Also for use with alloyed steels and stainless steels
- Per la lavorazione di acciai e getti di acciaio
- Buona scarico del truciolo
- Utilizzabile anche negli acciai legati e negli acciai inossidabili
- Pour l'usinage de l'acier et de l'acier coulé
- Bonne évacuation des copeaux
- Utilisable également dans les aciers alliés et inoxydables



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ○  | ○ | ● | ○   |  |



# -PMS

- For finishing and medium machining
- Positive cutting edge
- Very well suited for machining of steel
- *Per la finitura e la lavorazione media*
- *Tagliente positivo*
- *La soluzione ottimale per la lavorazione di acciaio*
- Pour la finition et l'usinage de semi-finition
- Bord tranchant positif
- Convient très bien pour l'usinage de l'acier



single sided  
su un lato  
d'un côté



|  |        |   |   |  |   |
|--|--------|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |        | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P<br>●                                   | M<br>○ | K   | N | S  | H |

# -EN-PS

- Excellent for Swiss type machining applications
- Very good cutting edge stability
- Straight cutting edge
- *Particolarmente adatto per le applicazioni di tornitura a fantina mobile*
- *Ottima stabilità del tagliente*
- *Tagliente diritto*
- Convient très bien pour des applications de chariotage
- Stabilité d'arête de coupe
- Arête de coupe droite



single sided  
su un lato  
d'un côté



|  |        |   |        |  |   |
|--|--------|---|--------|--|---|
| Finishing<br><i>Finitura</i><br>Finition |        | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |        | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P<br>○                                   | M<br>● | K<br>○  | N<br>● | S<br>●   | H |

# -FN-PS

- Excellent for Swiss type machining applications
- Sharp, straight cutting edge
- *Particolarmente adatto per le applicazioni di tornitura a fantina mobile*
- *Tagliente affilato e diritto*
- Convient très bien pour des applications de chariotage
- Bord tranchant et rectiligne



single sided  
su un lato  
d'un côté



|  |        |   |        |  |   |
|--|--------|---|--------|--|---|
| Finishing<br><i>Finitura</i><br>Finition |        | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |        | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P<br>○                                   | M<br>● | K<br>○  | N<br>● | S<br>●   | H |

**-U**

- Good chip control at low feed rate
- Low cutting force
- Excellent for cutting steel
- *Buon controllo del truciolo con avanzamento ridotto*
- *Ridotta forza di taglio*
- *Particolarmente adatto per la lavorazione ad asportazione di truciolo dell'acciaio*
- Bon contrôle des copeaux avec de faibles avances
- Faible efforts de coupe
- Convient parfaitement pour l'usinage d'acier



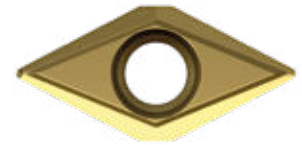
single sided  
su un lato  
d'un côté



| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |  |
|--|---|---|---|---|--|--|
| P  | M | K   | N | S | H  |  |
| ●  | ● | ○   |   |   |  |  |

**-Z**

- For machining steel, cast steel and stainless steels
- Ground geometry
- Peripheral chip breaker
- *Per la lavorazione dell'acciaio, dell'acciaio fuso e degli acciai inossidabili*
- *Geometria rettificata*
- *Canale rompitruciolo sulla circonferenza*
- Pour l'usinage d'acier, d'acier coulé et d'aciers inoxydables
- Géométrie rectifiée
- Brise-copeaux périphérique



single sided  
su un lato  
d'un côté



| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |  |
|--|---|---|---|---|--|--|
| P  | M | K   | N | S | H  |  |
| ●  | ● | ○   |   |   |  |  |

4

# POSITIVE MEDIUM MACHINING

LAVORAZIONE MEDIA  
POSITIVA

USINAGE DE SEMI-FINITION  
POSITIVE

## -AM

- Very good chip control at low to medium cutting depths
- Specially designed chip pimples
- Smooth chip evacuation and low cutting forces
- *Ottimo controllo della truciolatura con profondità di taglio ridotte o medie*
- *Nodi per la formazione del truciolo progettati appositamente*
- *Scarico del truciolo morbido e ridotte forze di taglio*
- Très bon contrôle des copeaux à des profondeurs de coupe faibles à moyennes
- Brise-copeaux spécialement conçu
- Évacuation douce des copeaux et faibles efforts de coupe



single sided  
su un lato  
d'un côté



Finishing  
Finitura  
Finition

Medium machining  
Medie asportazioni  
Usinage de semi-finition

Rough machining  
Sgrossatura  
Ébauche

P

M

K

N

S

H



## -PMT1

- For exotic materials and high-temperature resistance titanium nickel alloys
- High flank wear resistance and very good heat resistance
- Reliable running times and excellent chip control
- *Per materiali esotici e leghe di titanio-nichel resistenti al calore*
- *Elevata resistenza all'usura da intaglio e ottima resistenza al calore*
- *Prestazioni di funzionamento sicure e controllo truciolo eccellente*
- Pour les matériaux exotiques et les alliages de nickel et de titane réfractaires
- Grande résistance à l'usure en entaille et très bonne résistance à la chaleur
- Performances fonctionnelles fiables et excellent contrôle des copeaux



single sided  
su un lato  
d'un côté



Finishing  
Finitura  
Finition

Medium machining  
Medie asportazioni  
Usinage de semi-finition

Rough machining  
Sgrossatura  
Ébauche

P

M

K

N

S

H



**-Y**

- For machining steel, stainless steel and cast materials
- Sharp cutting edge
- For high surface quality
- Per la lavorazione di acciaio, acciaio inossidabile e materiali colati
- Tagliente affilato
- Per elevate finiture superficiali
- Pour l'usinage de l'acier, de l'acier inoxydable et des fontes
- Arêtes de coupes tranchantes
- Pour des états de surface élevés



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ○  |   |   |   |  |

**POSITIVE MEDIUM MACHINING TO ROUGHING**  
**LAVORAZIONE MEDIA POSITIVA E LAVORAZIONE DI SGROSSATURA**  
**USINAGE DE SEMI-FINITION POSITIVE JUSQU'À L'ÉBAUCHE**

4

**-SM**

- Medium to rough machining
- Reverse geometry
- Stable cutting edge
- Lavorazione media e lavorazione di sgrossatura
- Geometria neutra
- Tagliente stabile
- Usinage de semi-finition jusqu'à l'ébauche
- Géométrie recto/verso
- Arête de coupe stable



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ○ | ●  |   |   |   |  |

# HIGH-POSITIVE FINISH MACHINING

FINITURA ALTAMENTE POSITIVA

FINITION HAUTEMENT POSITIVE

## -EN-ASF

- Excellent for Swiss type machining applications
- Very good cutting edge stability
- Curved cutting edge
- *Particolarmente adatto per le applicazioni di tornitura a fantina mobile*
- *Ottima stabilità del tagliente*
- *Tagliente non rettilineo*
- Convient très bien pour des applications de chariotage
- Très bonne stabilité d'arêtes de coupe
- Dent courbée



single sided  
su un lato  
d'un côté



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ○  | ● | ●   | ○ |

## -FN-ASF

- Excellent for Swiss type machining applications
- Sharp cutting edge
- Curved cutting edge
- *Particolarmente adatto per le applicazioni di tornitura a fantina mobile*
- *Tagliente affilato*
- *Tagliente non rettilineo*
- Convient très bien pour des applications de chariotage
- Arête de coupe tranchante
- Dent courbée



single sided  
su un lato  
d'un côté



|                                   |   |  |   |   |   |
|-----------------------------------|---|--|---|---|---|
| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
| P                                 | M | K  | N | S   | H |
| ●                                 | ● | ○  | ● | ●   | ○ |

**HIGH-POSITIVE FINISH  
TO MEDIUM MACHINING**

*FINITURA ALTAMENTE  
POSITIVA E LAVORAZIONE  
MEDIA*

**DE LA FINITION HAUTEMENT  
POSITIVE À L'USINAGE DE  
SEMI-FINITION**

**-EN-ACB**

- Similar applications to “-ALU” geometry
- Very good cutting edge stability
- Specially designed chip pimples
- *Campo di applicazione simile a quello della geometria „-ALU“*
- *Ottima stabilità del tagliente*
- *Nodi per la formazione del truciolo progettati appositamente*
- Champ d'application similaire à celui de la géométrie « ALU »
- Très bonne stabilité des bords tranchants
- Brise-copeaux spécialement conçu



single sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ●   | ● | ●  | ○ |

4

**-FN-ACB**

- Similar applications to “-ALU” geometry
- Sharp cutting edge
- Specially designed chip pimples
- *Campo di applicazione simile a quello della geometria “-ALU”*
- *Tagliente affilato*
- *Nodi per la formazione del truciolo progettati appositamente*
- Champ d'application similaire à celui de la géométrie « ALU »
- Arête de coupe tranchante
- Brise-copeaux spécialement conçu



single sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ● | ●   | ● | ●  | ○ |

# -EN-ALU

- Optimised machining of unstable, thin-walled workpieces
- Very good cutting edge stability
- Good resistance to edge build-up
- *Lavorazione ottimale di parti non stabili e con pareti sottili*
- *Ottima stabilità del tagliente*
- *Ridotta tendenza alla formazione di tagliente di riporto*
- Usinage optimal des pièces instables et fines
- Très bonne stabilité d'arête de coupe
- Inclinaison faible par rapport à la formation d'arêtes de coupe



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ●  | ● | ● | ○   |  |

# -FN-ALU

- Optimised machining of unstable, thin-walled workpieces
- Sharp cutting edge
- Good resistance to edge build-up
- *Lavorazione ottimale di parti non stabili e con pareti sottili*
- *Tagliente affilato*
- *Ridotta tendenza alla formazione di tagliente di riporto*
- Usinage optimal des pièces instables et fines
- Bord tranchant
- Inclinaison faible par rapport à la formation d'arêtes de coupe



single sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   |   | Rough machining<br>Sgrossatura<br>Ébauche |  |
|-----------------------------------|---|--|---|---|---|--|
| P                                 | M | K  | N | S | H   |  |
| ●                                 | ● | ●  | ● | ● | ○   |  |

**HIGH-POSITIVE FINISH  
TO ROUGH MACHINING**  
*FINITURA ALTAMENTE  
POSITIVA E SGROSSATURA*  
**FINITION HAUTEMENT  
POSITIVE JUSQU'À L'ÉBAUCHE**

**-AWI  
WIPER**

- WIPER geometry
- Very good surface quality achievable
- For finish machining steels, stainless steels and aluminium
- *Geometria WIPER*
- *Rettificata, per un'ottima finitura superficiale*
- *Per la finitura di acciai, acciai inossidabili e alluminio*
- Géométrie WIPER
- Permet d'obtenir de très bons états de surface
- Pour la finition d'aciers, d'aciers inoxydables et de l'aluminium



single sided  
su un lato  
d'un côté



| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
|--|---|---|---|--|---|
| P  | M | K   | N | S  | H |
| ●  | ● | ○   | ● | ○  | ○ |



# PS2-GEOMETRY IN TEST – FINISH MACHINING STEEL.

## Starting situation:

When a housing ( $\varnothing$  40 mm) made of 42CrMo4 (1.7227) is turned, a longer tool life and a shorter machining time are specified.

## Competitor cutting data:

Vc 180 m/min  
ap 0.11 mm  
f 0.5 mm

## Competition



**Optimisation measures:  
Use of ARNO PS2 geometry and adaptation of cutting values.**

## ARNO cutting data:

Vc 200 m/min  
ap 0.5 mm  
f 0.2 mm

## ARNO



## Details:

Holder: KMH01-C2-30x20x70-IK  
Tool holder: SDJCL 2020X11-IK-UN  
Indexable insert: DCMT 11T304EN-PS2 AP2320  
Coolant: emulsion

## Result:

**50% shorter machining time and 20% longer tool life were achieved; costs were reduced by 15% due to more favourable ARNO indexable insert.**

# AWI GEOMETRY IN TEST – FINISH MACHINING STAINLESS STEEL.

## Starting situation:

When stainless steel Stahl X5CrNi18-10 (1.4301) is turned at  $\varnothing$  20 mm, a surface finish quality of Rz 3.5 and an increase in the tool life of the indexable insert are specified.

## Competitor cutting data:

Vc 216 m/min  
ap 0.15 mm  
f 0.06 mm

## Competition



## Optimisation measures:

Use of ARNO AWI geometry and increase in rotating speed and feed rate.

## ARNO cutting data:

Vc 250 m/min  
ap 0.15 mm  
f 0.1 mm

## ARNO



## Details:

Holder: KMH01-C2-30x20x70-IK  
Tool holder: SVJCL 2020x11-IK-UN  
Indexable insert: VCGT 110308FN-AWI AL10  
Coolant: oil

## Result:

An Rz value of 1.8 was achieved; at the same time, costs and time were saved (machine approx. 48% of work step for outer contour) and the indexable insert tool life was increased.

# GEOMETRIA PS2 IN TEST – FINITURA DI ACCIAIO.

## Situazione di partenza:

Durante la tornitura di un particolare ( $\varnothing$  40 mm) in 42CrMo4 (1.7227) si deve ottenere una durata maggiore e un tempo di lavorazione più breve.

## Dati di taglio concorrenza:

Vc 180 m/min  
ap 0,11 mm  
f 0,5 mm

## Concorrenza



## Interventi di ottimizzazione Impiego della geometria ARNO PS2 e adattamento dei valori di taglio

## Dati di taglio ARNO:

Vc 200 m/min  
ap 0,5 mm  
f 0,2 mm

## ARNO



## Dettagli:

Adattatore: KMH01-C2-30x20x70-IK  
Portainseri: SDJCL 2020X11-IK-UN  
Inserto: DCMT 11T304EN-PS2 AP2320  
Refrigerante: Emulsione

## Risultato:

**sono stati raggiunti un tempo di lavorazione ridotto del 50% e una durata maggiore del 20%, i costi sono stati ridotti del 15% grazie all'inserto Arno più performante.**

# GEOMETRIA AWI IN TEST – FINITURA DI ACCIAIO INOSSIDABILE.

## Situazione di partenza:

Durante la tornitura di acciaio inossidabile X5CrNi18-10 (1.4301) per un  $\varnothing$  di 20 mm il valore superficiale di Rz 3,5 dovrà essere garantito e la durata dell'inserto dovrà essere aumentata.

## Dati di taglio concorrenza:

|    |           |
|----|-----------|
| Vc | 216 m/min |
| ap | 0,15 mm   |
| f  | 0,06 mm   |

## Concorrenza



**Interventi di ottimizzazione**  
Impiego della geometria AWI ARNO e aumento del numero di giri e dell'avanzamento.

## Dati di taglio ARNO:

|    |           |
|----|-----------|
| Vc | 250 m/min |
| ap | 0,15 mm   |
| f  | 0,1 mm    |

## ARNO



## Dettagli:

|                |                        |
|----------------|------------------------|
| Adattatore:    | KMH01-C2-30x20x70-IK   |
| Portainseriti: | SVJCL 2020x11-IK-UN    |
| Inserto:       | VCGT 110308FN-AWI AL10 |
| Refrigerante:  | olio                   |

## Risultato:

**è stato raggiunto il valore Rz di 1,8, contemporaneamente sono stati ridotti costi e tempi (lavorazione ca. 48% della fase di tornitura profilo esterno) e la durata dell'inserto è stata aumentata.**

# GÉOMÉTRIE PS2 À L'ESSAI – FINITION DE L'ACIER.

## Situation de départ :

On vise une durée de vie plus longue et un temps d'usinage réduit lors du tournage d'un boîtier (ø 40 mm) en 42CrMo4 (1.7227).

## Données de coupe de la concurrence :

Vc 180 m/min  
ap 0,11 mm  
f 0,5 mm

## Concurrence



**Mesures d'optimisation :  
utilisation de la géométrie PS2 ARNO et ajustement des valeurs de coupe.**

## Données de coupe ARNO :

Vc 200 m/min  
ap 0,5 mm  
f 0,2 mm

## ARNO



## Détails :

Support : KMH01-C2-30x20x70-IK  
Support de serrage : SDJCL 2020X11-IK-UN  
Plaquette de coupe amovible : DCMT 11T304EN-PS2 AP2320  
Refroidissement : Émulsion

## Résultat :

**Temps d'usinage réduit de 50 % et durée de vie prolongée de 20 %. Les coûts ont également été réduits de 15 % grâce aux plaquettes de coupe amovibles plus abordables d'Arno.**

# GÉOMÉTRIE AWI À L'ESSAI – FINITION DE L'ACIER INOXYDABLE.

## Situation de départ :

Lors du tournage d'un acier inoxydable X5CrNi18-10 (1.4301) de  $\varnothing$  20 mm, on vise une valeur de surface de Rz 3,5. La durée de vie de la plaquette de coupe amovible doit aussi être augmentée.

## Données de coupe de la concurrence :

Vc 216 m/min  
ap 0,15 mm  
f 0,06 mm

## Concurrence



**Mesures d'optimisation :**  
utilisation de la géométrie AWI ARNO et augmentation de la vitesse de rotation et de l'avance.

## Données de coupe ARNO :

Vc 250 m/min  
ap 0,15 mm  
f 0,1 mm

## ARNO



## Détails :

Support : KMH01-C2-30x20x70-IK  
Support de serrage : SVJCL 2020x11-IK-UN  
Plaquette de coupe amovible : VCGT 110308FN-AWI AL10  
Refroidissement : Huile

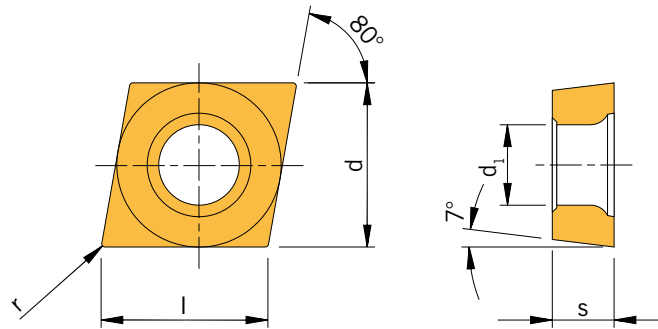
## Résultat :

Une valeur Rz de 1,8 a été atteinte tout en économisant de l'argent et du temps (env. 48 % de l'opération d'usinage du contour extérieur). La durée de vie de la plaquette de coupe amovible a également été prolongée.

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   | HC     |        |        |        |        |         |  |  |  |   |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|--|--|--|---|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |  |  |  |   |
| CCGT 060202EN                      | 0,20 | 0,04 - 0,10    | 0,10 - 0,6     |      |      |        |        | ◆    |        |        |        |        |        |         |  |  |  |   |
| CCGT 060204EN                      | 0,40 | 0,06 - 0,12    | 0,20 - 0,6     |      |      |        |        | ◆    |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T302EN                      | 0,20 | 0,04 - 0,10    | 0,10 - 1,0     |      |      |        |        | ◆    |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T304EN                      | 0,40 | 0,06 - 0,12    | 0,20 - 1,0     |      |      |        | ◆      | ◆    |        |        |        |        |        |         |  |  |  |   |
| CCGT 060204FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 3,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T304EN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 4,0     |      |      |        |        |      |        |        |        |        |        |         |  |  |  | ◆ |
| CCGT 09T304FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 4,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T308EN-ACB                  | 0,80 | 0,10 - 0,35    | 0,80 - 4,0     |      |      |        |        |      |        |        |        |        |        |         |  |  |  | ◆ |
| CCGT 09T308FN-ACB                  | 0,80 | 0,10 - 0,35    | 0,80 - 4,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120404EN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 5,0     |      |      |        |        |      |        |        |        |        |        |         |  |  |  | ◆ |
| CCGT 120404FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 5,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120408EN-ACB                  | 0,80 | 0,10 - 0,35    | 0,80 - 5,0     |      |      |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120408FN-ACB                  | 0,80 | 0,10 - 0,35    | 0,80 - 5,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 0602005FN-ALU                 | 0,05 | 0,02 - 0,06    | 0,05 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 060201FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,50 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 060202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 2,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 060204FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 3,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T301FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,50 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T302FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 2,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T304FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 4,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T308FN-ALU                  | 0,80 | 0,10 - 0,35    | 0,80 - 4,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 09T3005FN-ALU                 | 0,05 | 0,02 - 0,06    | 0,50 - 1,5     |      |      |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120401FN-ALU                  | 0,10 | 0,05 - 0,12    | 0,50 - 2,0     | ◆    |      |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120402FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 2,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120404FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 5,0     | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| CCGT 120408FN-ALU                  | 0,80 | 0,10 - 0,35    | 0,80 - 5,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |





# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   |        | HC     |        |        |        |         |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |
| CCGT 0602005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,10 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |
| CCGT 060201EN-ASF                  | 0,10 | 0,02 - 0,06    | 0,10 - 1,5     |      |      |        |        |      |        |        |        |        |        |         |
| CCGT 060201FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,10 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |
| CCGT 060202EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     |      |      |        |        |      |        | ◆      |        | ◆      |        |         |
| CCGT 060202FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     | ◆    | ◆    |        |        |      |        |        |        |        | ◆      |         |
| CCGT 060204EN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     |      |      |        |        |      |        | ◆      |        | ◆      |        |         |
| CCGT 060204FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     | ◆    | ◆    |        |        |      |        |        |        |        | ◆      |         |
| CCGT 09T301FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,10 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |
| CCGT 09T302EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     |      |      |        |        |      |        | ◆      |        | ◆      |        |         |
| CCGT 09T302FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |
| CCGT 09T304EN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     |      |      |        |        |      |        | ◆      |        | ◆      |        |         |
| CCGT 09T304FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     | ◆    | ◆    |        |        |      |        |        |        |        | ◆      |         |
| CCGT 09T308FN-ASF                  | 0,80 | 0,10 - 0,30    | 0,30 - 3,0     |      | ◆    |        |        |      |        |        |        |        | ◆      |         |
| CCGT 09T3005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,10 - 1,5     | ◆    | ◆    |        |        |      |        |        |        |        |        |         |
| CCGT 060202FN-AWI                  | 0,20 | 0,10 - 0,30    | 0,30 - 3,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 060204FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,50 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 060208FN-AWI                  | 0,80 | 0,15 - 0,50    | 0,70 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 09T302FN-AWI                  | 0,20 | 0,10 - 0,30    | 0,30 - 3,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 09T304FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,50 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 09T308FN-AWI                  | 0,80 | 0,15 - 0,50    | 0,70 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 120404FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,50 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 120408FN-AWI                  | 0,80 | 0,15 - 0,50    | 0,70 - 4,0     | ◆    |      |        |        |      |        |        |        |        |        |         |
| CCGT 060201FN-AZ                   | 0,10 | 0,05 - 0,15    | 0,80 - 2,5     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 060202FN-AZ                   | 0,20 | 0,05 - 0,15    | 0,80 - 2,5     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 060204FN-AZ                   | 0,40 | 0,05 - 0,15    | 0,80 - 2,5     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 09T302FN-AZ                   | 0,20 | 0,08 - 0,28    | 1,50 - 3,5     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 09T304FN-AZ                   | 0,40 | 0,08 - 0,28    | 1,50 - 3,5     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 060202FL-FS                   | 0,20 | 0,04 - 0,12    | 0,10 - 1,0     |      |      |        |        | ◆    |        |        |        |        |        |         |
| CCGT 0602005FN-PS                  | 0,05 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 060201EN-PS                   | 0,10 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 060201FN-PS                   | 0,10 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 060202EN-PS                   | 0,20 | 0,04 - 0,10    | 0,10 - 0,6     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 060202FN-PS                   | 0,20 | 0,04 - 0,10    | 0,10 - 0,6     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 060204EN-PS                   | 0,40 | 0,06 - 0,12    | 0,20 - 0,6     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 060204FN-PS                   | 0,40 | 0,06 - 0,12    | 0,20 - 0,6     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 09T301EN-PS                   | 0,10 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 09T301FN-PS                   | 0,10 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 09T302EN-PS                   | 0,20 | 0,04 - 0,10    | 0,10 - 1,0     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 09T302FN-PS                   | 0,20 | 0,04 - 0,10    | 0,10 - 1,0     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 09T304EN-PS                   | 0,40 | 0,06 - 0,12    | 0,20 - 1,0     |      |      |        |        |      |        |        | ◆      |        |        |         |
| CCGT 09T304FN-PS                   | 0,40 | 0,06 - 0,12    | 0,20 - 1,0     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| CCGT 09T3005FN-PS                  | 0,05 | 0,02 - 0,06    | 0,10 - 0,5     |      |      |        |        |      | ◆      |        | ◆      |        |        |         |

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# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   |        | HC     |        |        |        |         |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |
| CCGT 060201FL-U                    | 0,10 | 0,04 - 0,10    | 0,10 - 0,8     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 060201FR-U                    | 0,10 | 0,04 - 0,10    | 0,10 - 0,8     |      |      |        |        | ◆    | ◆      |        |        |        |        |         |
| CCGT 060202FL-U                    | 0,20 | 0,04 - 0,12    | 0,10 - 1,0     |      |      |        |        | ◆    | ◆      |        |        |        |        |         |
| CCGT 060202FR-U                    | 0,20 | 0,04 - 0,12    | 0,10 - 1,0     |      |      |        |        |      | ◆      |        |        |        |        |         |
| CCGT 09T302FL-U                    | 0,20 | 0,04 - 0,12    | 0,10 - 1,0     |      |      |        |        | ◆    | ◆      |        |        |        |        |         |
| CCGT 09T302FR-U                    | 0,20 | 0,04 - 0,12    | 0,10 - 1,0     |      |      |        |        |      | ◆      |        |        |        |        |         |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| M | ○ | ○ | ● | ● | ● | ○ | ● | ● | ● | ● | ○ | ○ | ○ |
| K | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |   |   | ○ |   |   | ○ | ○ |   |
| S | ○ | ○ | ● |   |   |   |   | ● |   | ● | ● | ● |   |
| H |   |   |   |   |   |   |   | ○ |   |   | ○ |   |   |

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|  | HC  |      |      |      |      | HU   |      |        |        |
|--|-----|------|------|------|------|------|------|--------|--------|
|  | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 | AK1010 | AK1020 |
|  |     |      |      |      |      |      |      |        |        |
|  |     |      |      |      |      |      |      |        |        |
|  |     |      |      |      |      |      |      |        |        |
|  |     |      |      |      |      |      |      |        |        |
|  |     |      |      |      |      |      |      |        |        |

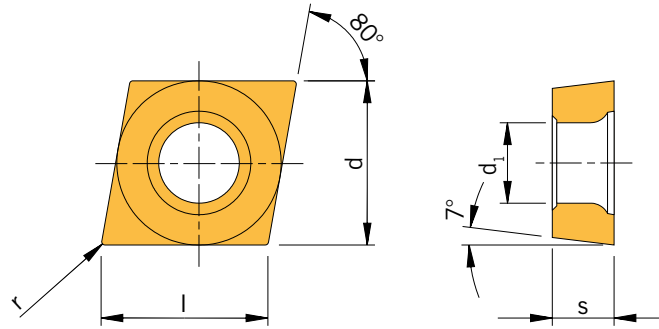
|  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
|--|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
|  | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            |                                  |                                  |                                  |                                  |                                  |
|  | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            |                                  |                                  |                                  |                                  |                                  |
|  | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            |                                  | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            |
|  | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> |
|  | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            |                                  | <input type="radio"/>            | <input type="radio"/>            |                                  | <input type="radio"/>            |

- **Main application**  
Applicazione principale  
Application principale
- **Secondary application**  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCGW



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| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| CCGW 060202EN                      | 0,2 | 0,02 - 0,05    | 0,08 - 1,5     | ◆            |
| CCGW 060204EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 1,5     | ◆            |
| CCGW 09T304EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 2,0     | ◆            |
| CCGW 09T308EN                      | 0,8 | 0,02 - 0,05    | 0,08 - 2,0     | ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

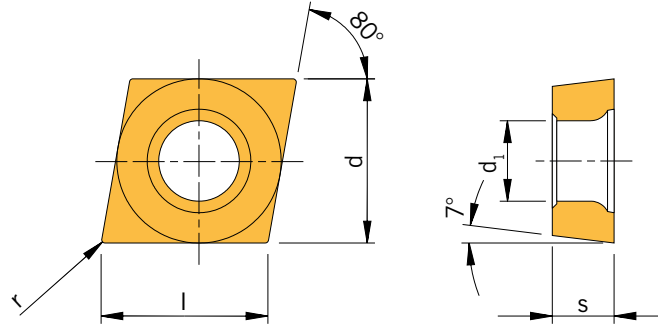
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCGX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HU   |
|------------------------------------|-----|----------------|----------------|--------|------|
|                                    |     |                |                | AM5025 | AK20 |
| CCGX 060200F L/R                   | 0,0 | 0,04 - 0,10    | 0,05 - 0,4     | ◆      | ◆    |
| CCGX 060201F L/R                   | 0,1 | 0,04 - 0,10    | 0,10 - 0,8     | ◆      | ◆    |
| CCGX 060202F L/R                   | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |
| CCGX 060204F L/R                   | 0,4 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |
| CCGX 09T300F L/R                   | 0,0 | 0,04 - 0,10    | 0,05 - 0,4     | ◆      | ◆    |
| CCGX 09T301F L/R                   | 0,1 | 0,04 - 0,10    | 0,10 - 0,8     | ◆      | ◆    |
| CCGX 09T302F L/R                   | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |
| CCGX 09T304F L/R                   | 0,4 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

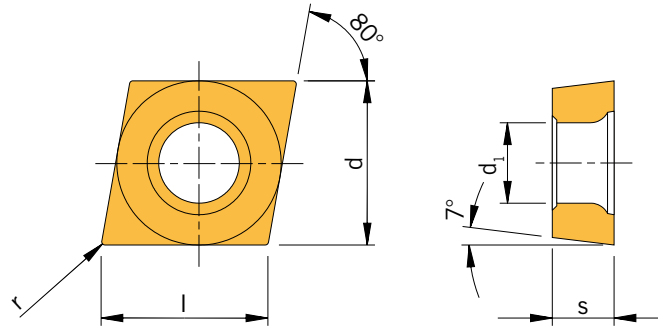
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

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# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        | CC     | CU   | HC     |        |        | CC     | HC    |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|-------|--------|--------|
|                                    |     |                |                | AP2110 | AP2310 | AP2320 | AP2335 | AP6510 | ACE6 | AP6010 | AM2130 | AM5110 | AM5120 | AC90C | AK2110 | AK2310 |
| CCMT 060202EN-AM                   | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        |        |        |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 060204EN-AM                   | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     |        |        | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 060208EN-AM                   | 0,8 | 0,12 - 0,25    | 0,50 - 2,0     |        |        | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 09T302EN-AM                   | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        |        |        |        |      |        |        |        |        |       |        |        |
| CCMT 09T304EN-AM                   | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     |        |        | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 09T308EN-AM                   | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     |        | ◆      | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 120404EN-AM                   | 0,4 | 0,12 - 0,25    | 0,40 - 3,5     |        |        | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 120408EN-AM                   | 0,8 | 0,12 - 0,32    | 0,50 - 3,5     |        |        | ◆      | ◆      |        |      |        | ◆      |        | ◆      |       |        |        |
| CCMT 060202EN-AQ                   | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        |        |        |        | ◆    |        |        |        |        |       |        |        |
| CCMT 060204EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     |        |        |        |        |        | ◆    |        |        |        | ◆      |       |        |        |
| CCMT 09T302EN-AQ                   | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        |        |        |        | ◆    |        |        |        |        |       |        |        |
| CCMT 09T304EN-AQ                   | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     |        |        |        |        | ◆      | ◆    | ◆      |        |        |        |       |        |        |
| CCMT 09T308EN-AQ                   | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     |        |        |        |        | ◆      | ◆    |        |        |        |        |       |        |        |
| CCMT 060202EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        |        |        |        |      | ◆      | ◆      |        | ◆      |       |        |        |
| CCMT 060204EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     |        | ◆      | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       | ◆      |        |
| CCMT 09T302EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,30 - 2,0     |        |        | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       |        |        |
| CCMT 09T304EN-PM1                  | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     | ◆      |        | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       |        |        |
| CCMT 09T308EN-PM1                  | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     |        |        | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       |        | ◆      |
| CCMT 120404EN-PM1                  | 0,4 | 0,12 - 0,25    | 0,40 - 3,5     |        |        | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       |        |        |
| CCMT 120408EN-PM1                  | 0,8 | 0,12 - 0,32    | 0,50 - 3,5     |        |        | ◆      |        |        |      | ◆      | ◆      | ◆      | ◆      |       |        |        |
| CCMT 060202EN-PMC                  | 0,2 | 0,04 - 0,16    | 0,28 - 1,8     |        |        |        |        | ◆      |      |        |        |        |        |       |        |        |
| CCMT 060204EN-PMC                  | 0,4 | 0,06 - 0,18    | 0,30 - 2,0     |        |        |        |        | ◆      | ◆    |        |        |        |        |       |        |        |
| CCMT 09T304EN-PMC                  | 0,4 | 0,08 - 0,20    | 0,30 - 2,0     |        |        |        |        | ◆      |      |        |        |        |        |       |        |        |
| CCMT 120404EN-PMC                  | 0,4 | 0,10 - 0,25    | 0,30 - 2,5     |        |        |        |        | ◆      |      |        |        |        |        |       |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbone avec revêtement  
CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ● |   | ○ | ○ | ● | ○ | ○ |
| M |   |   |   |   | ● | ● | ○ | ● | ● | ● | ● |   |   |
| K | ○ |   |   |   | ○ | ○ | ○ |   | ○ | ○ | ○ | ● | ● |
| N |   |   |   |   |   |   |   |   | ○ | ○ |   |   |   |
| S |   |   |   |   |   |   |   |   | ● | ● |   |   |   |
| H |   |   |   |   |   |   |   |   | ○ | ○ |   |   |   |



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        | CC     | CU   | HC     |        |        | CC     | HC    |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|-------|--------|
|                                    |     |                |                | AP2110 | AP2310 | AP2320 | AP2335 | AP6510 | ACE6 | AP6010 | AM2130 | AM5110 | AM5120 | AC90C | AK2110 |
| CCMT 060202EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     |        | ◆      | ◆      |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 060204EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,10 - 1,5     |        |        | ◆      |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 09T302EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     |        | ◆      | ◆      |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 09T304EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,10 - 1,5     |        | ◆      | ◆      |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 060202EN-PMT1                 | 0,2 | 0,05 - 0,20    | 0,20 - 1,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 060204EN-PMT1                 | 0,4 | 0,06 - 0,20    | 0,20 - 1,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 09T302EN-PMT1                 | 0,2 | 0,05 - 0,20    | 0,30 - 2,0     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |       |        |
| CCMT 09T304EN-PMT1                 | 0,4 | 0,06 - 0,20    | 0,30 - 2,0     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |       |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

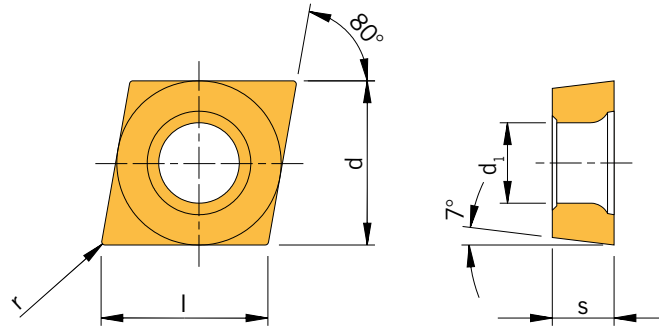
|   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ● | ○ | ○ |
| M |   |   |   |   | ● | ● | ○ | ● | ● | ● | ● |   |
| K | ○ |   |   |   | ○ | ○ | ○ |   | ○ | ○ | ○ | ● |
| N |   |   |   |   |   |   |   |   | ○ | ○ |   |   |
| S |   |   |   |   |   |   |   |   | ● | ● |   |   |
| H |   |   |   |   |   |   |   |   | ○ | ○ |   |   |



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCXT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |
|------------------------------------|-----|----------------|----------------|--------|
|                                    |     |                |                | AM5020 |
| CCXT 060202EN-AEC                  | 0,2 | 0,05 - 0,12    | 0,5 - 2        | ◆      |
| CCXT 060204EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 3        | ◆      |
| CCXT 09T304EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 4        | ◆      |
| CCXT 120404EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 5        | ◆      |



HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

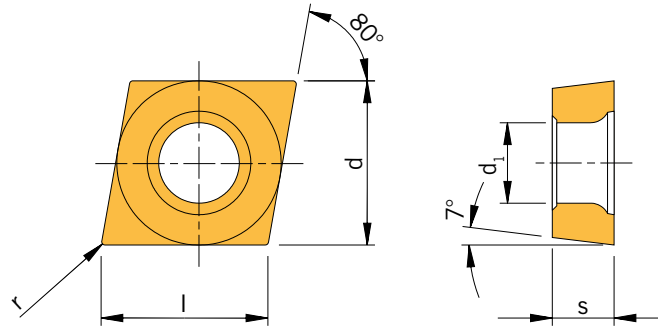
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CCMX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM35C |
|------------------------------------|-----|----------------|----------------|-------------|
| CCMX 120404EN                      | 0,4 | 0,08 - 0,14    | 0,1 - 3        | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ○ |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

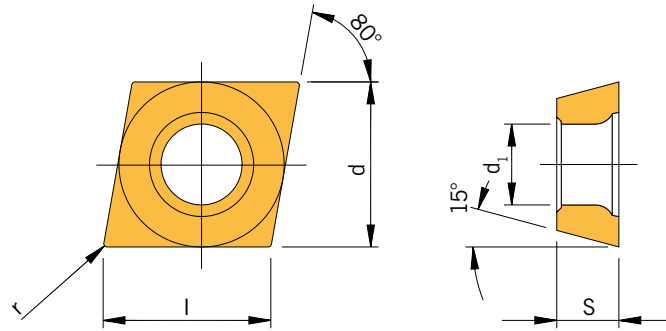
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CDGT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM15C | HU<br>AK20 |
|------------------------------------|-----|----------------|----------------|-------------|------------|
| CDGT 040102F L/R                   | 0,2 | 0,04 - 0,12    | 0,1 - 1        | ◆           | ◆          |
| CDGT 040104F L/R                   | 0,4 | 0,04 - 0,12    | 0,1 - 1        | ◆           |            |
|                                    |     |                |                |             |            |
|                                    |     |                |                |             |            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

**!** Please note: Left-hand grooving insert → Holder right-hand design, Right-hand grooving insert → Holder left-hand design  
Attenzione: inserto sinistro → portautensile destro, inserto destro → portautensile sinistro  
À noter : plaquette à gauche → support à droite, plaquette à droite → support à gauche

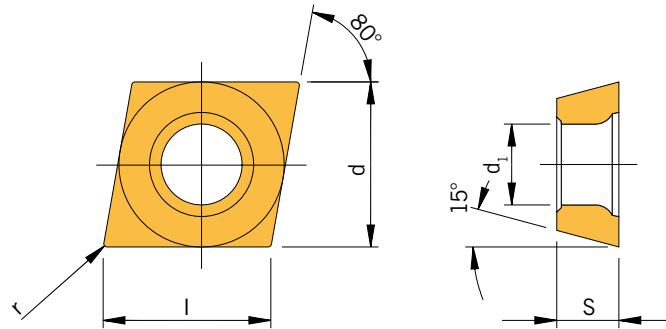
|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S |   | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CDGW



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM15C | HU<br>AK20 |
|------------------------------------|-----|----------------|----------------|-------------|------------|
| CDGW 040102EN                      | 0,2 | 0,02 - 0,05    | 0,06 - 1       | ◆           | ◆          |
|                                    |     |                |                |             |            |
|                                    |     |                |                |             |            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S |   | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

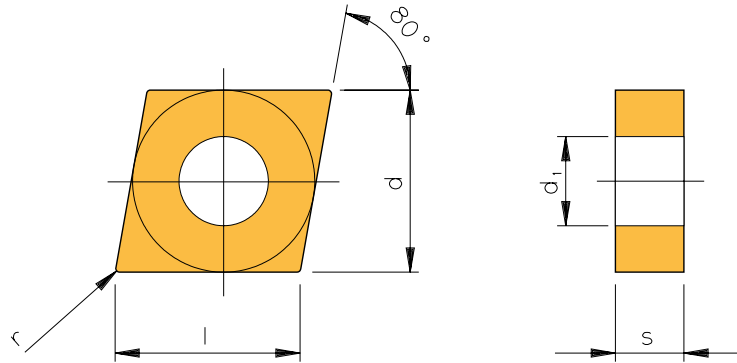
4

# ISO Indexable inserts Ultra-hard cutting materials

Inserti a fissaggio meccanico-ISO Materiali Extra duri

Plaquettes de coupe amovibles ISO Matériaux de coupe ultra-durs

## CNGA



4



| Designation<br>Articolo<br>Article | l    | d    | s    | d <sub>1</sub> | r   | HC<br>AH4205 |
|------------------------------------|------|------|------|----------------|-----|--------------|
| CNGA 120402EN                      | 12,9 | 12,7 | 4,76 | 5,5            | 0,2 | ◆            |
| CNGA 120404EN                      | 12,9 | 12,7 | 4,76 | 5,5            | 0,4 | ◆            |
| CNGA 120408EN                      | 12,9 | 12,7 | 4,76 | 5,5            | 0,8 | ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

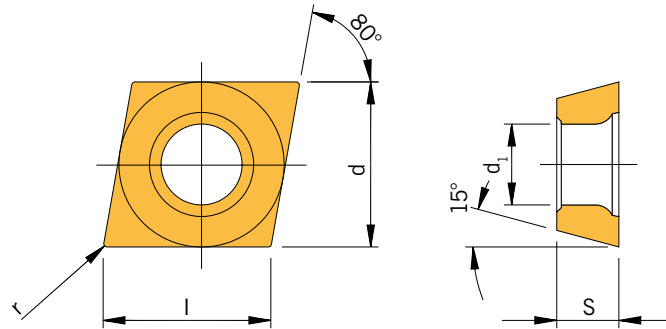
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CDMT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | CU     | HC     |
|------------------------------------|-----|----------------|----------------|--------|--------|
|                                    |     |                |                | AP6010 | AM5130 |
| CDMT 040102EN-PM1                  | 0,2 | 0,08 - 0,20    | 0,4 - 1,5      | ◆      |        |
|                                    |     |                |                |        |        |
|                                    |     |                |                |        |        |
| CDMT 040104EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      | ◆      | ◆      |
|                                    |     |                |                |        |        |
|                                    |     |                |                |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ○ | ○ |
| K | ○ | ○ |
| N |   | ● |
| S |   | ● |
| H |   | ○ |

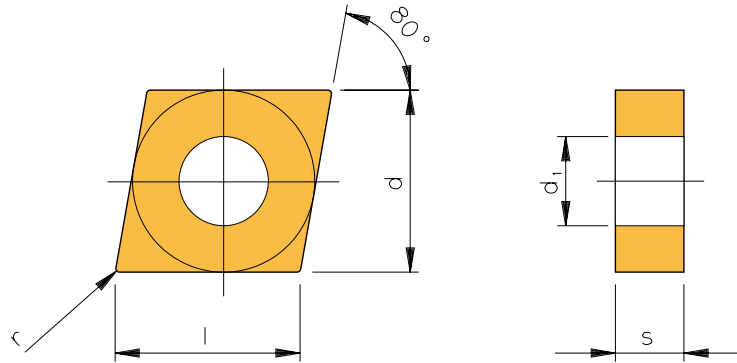
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CNGG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| CNGG 120402EN-NFS                  | 0,2 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| CNGG 120404EN-NFS                  | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| CNGG 120408EN-NFS                  | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
|                                    |     |                |                |              |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

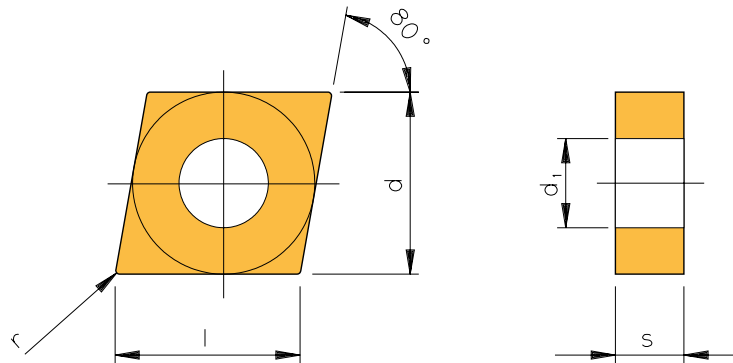
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CNGP



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HU     |
|------------------------------------|-----|----------------|----------------|--------|--------|
|                                    |     |                |                | AM5025 | AK1020 |
| CNGP 120402FN-EX                   | 0,2 | 0,05 - 0,25    | 0,03 - 3,0     | ◆      | ◆      |
| CNGP 120404FN-EX                   | 0,4 | 0,05 - 0,25    | 0,05 - 3,5     | ◆      | ◆      |
| CNGP 120408FN-EX                   | 0,8 | 0,05 - 0,25    | 0,05 - 4,0     | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

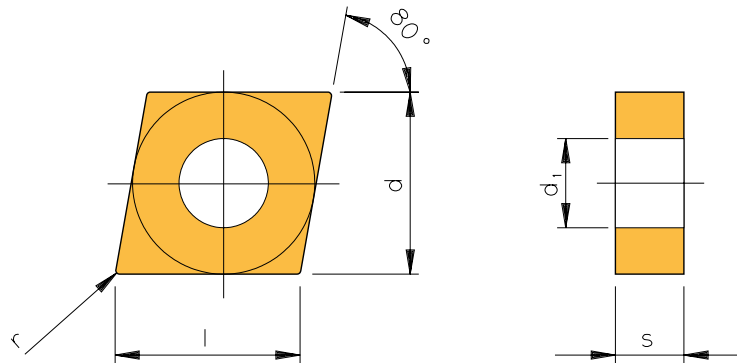
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CNMG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        | CC     | CU     | HC     |        |      |        |        |        |        |  |  |  |  |  |  |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--|--|--|--|--|--|
|                                    |     |                |                | AP2025 | AP2310 | AP2320 | AP2335 | AP2420 | AP6510 | ACE6 | AM2110 | AM2130 | AM5110 | AM5120 |  |  |  |  |  |  |
| CNMG 120404EN-AQ                   | 0,4 | 0,12 - 0,25    | 0,4 - 3,5      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-AQ                   | 0,8 | 0,12 - 0,32    | 0,5 - 3,5      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 090304EN-NA                   | 0,4 | 0,10 - 0,20    | 0,5 - 2,0      | ◆      |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 090308EN-NA                   | 0,8 | 0,15 - 0,32    | 0,8 - 2,0      | ◆      |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120404EN-NFT                  | 0,4 | 0,08 - 0,17    | 0,4 - 1,5      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-NFT                  | 0,8 | 0,10 - 0,20    | 0,5 - 2,0      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120404EN-NM2                  | 0,4 | 0,10 - 0,20    | 0,5 - 3,0      |        |        | ◆      |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-NM2                  | 0,8 | 0,15 - 0,32    | 0,8 - 3,0      |        | ◆      | ◆      | ◆      | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120412EN-NM2                  | 1,2 | 0,15 - 0,35    | 0,8 - 3,5      |        | ◆      | ◆      |        | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 160608EN-NM2                  | 0,8 | 0,15 - 0,35    | 0,8 - 4,5      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-NMG1                 | 0,8 | 0,20 - 0,40    | 0,8 - 6,0      |        | ◆      | ◆      | ◆      | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120412EN-NMG1                 | 1,2 | 0,25 - 0,60    | 1,0 - 6,0      |        |        | ◆      | ◆      | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 160612EN-NMG1                 | 1,2 | 0,25 - 0,60    | 1,2 - 8,0      |        |        | ◆      | ◆      | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 190612EN-NMG1                 | 1,2 | 0,25 - 0,65    | 1,2 - 10,0     |        |        |        |        | ◆      |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 190616EN-NMG1                 | 1,6 | 0,35 - 0,80    | 1,6 - 10,0     |        |        |        | ◆      |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120404EN-NMR                  | 0,4 | 0,08 - 0,20    | 0,5 - 4,0      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-NMR                  | 0,8 | 0,12 - 0,30    | 0,8 - 4,0      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120412EN-NMR                  | 1,2 | 0,15 - 0,32    | 1,0 - 4,0      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120404EN-NMT                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120408EN-NMT                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |
| CNMG 120412EN-NMT                  | 1,2 | 0,10 - 0,20    | 0,5 - 1,6      |        |        |        |        |        |        |      |        |        |        |        |  |  |  |  |  |  |



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        |        | CC     | CU   | HC     |        |        |        |   |   |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|---|---|
|                                    |     |                |                | AP2025 | AP2310 | AP2320 | AP2335 | AP2420 | AP6510 | ACE6 | AM2110 | AM2130 | AM5110 | AM5120 |   |   |
| CNMG 120408EN-NMT1                 | 0,8 | 0,12 - 0,30    | 0,8 - 4,0      |        |        |        |        |        |        |      |        |        |        | ◆      | ◆ | ◆ |
| CNMG 120412EN-NMT1                 | 1,2 | 0,15 - 0,32    | 1,0 - 4,0      |        |        |        |        |        |        |      |        |        |        | ◆      |   | ◆ |
| CNMG 120404EN-NS1                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        | ◆      |        |        |        |      |        | ◆      |        |        |   |   |
| CNMG 120408EN-NS1                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        | ◆      |        |        |        |      |        |        |        |        |   |   |
| CNMG 120404EN-VA                   | 0,4 | 0,20 - 0,40    | 1,5 - 4,0      |        |        |        |        |        |        |      |        |        |        |        |   | ◆ |
| CNMG 120408EN-VA                   | 0,8 | 0,20 - 0,40    | 1,5 - 4,0      |        |        |        |        |        |        |      |        |        |        |        |   | ◆ |

4

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

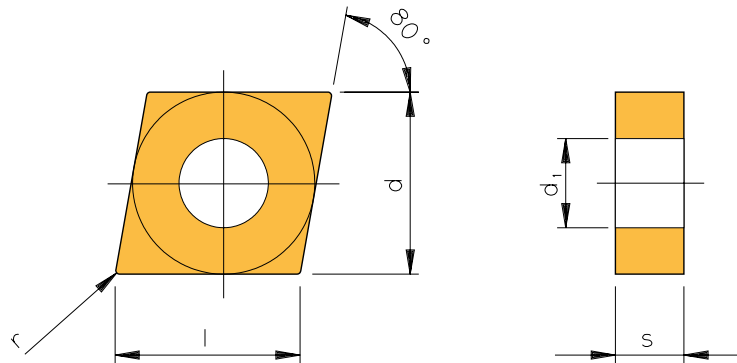
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ |   |   | ○ | ○ |
| M | ○ |   |   |   |   |   |   | ● | ● | ● | ● | ● | ● | ● | ● |
| K | ● |   |   |   |   |   | ○ | ○ |   |   |   |   |   | ○ | ○ |
| N |   |   |   |   |   |   |   |   |   |   |   |   |   | ○ | ○ |
| S | ○ |   |   |   |   |   |   |   |   |   |   |   |   | ● | ● |
| H |   |   |   |   |   |   |   |   |   |   |   |   |   | ○ | ○ |



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CNMM



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        | HC     |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 |
| CNMM 120408EN-NR1                  | 0,8 | 0,30 - 0,5     | 0,8 - 7        | ◆      | ◆      | ◆      |
| CNMM 120412EN-NR1                  | 1,2 | 0,35 - 0,7     | 1,2 - 7        | ◆      |        | ◆      |
| CNMM 160612EN-NR1                  | 1,2 | 0,35 - 0,7     | 1,2 - 9        | ◆      | ◆      | ◆      |
| CNMM 160616EN-NR1                  | 1,6 | 0,40 - 0,9     | 1,6 - 9        |        |        | ◆      |
| CNMM 190616EN-NR1                  | 1,6 | 0,40 - 0,9     | 1,6 - 10       | ◆      | ◆      |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● | ● | ● |   |
| M |   |   |   | ● |
| K |   |   |   |   |
| N |   |   |   |   |
| S |   |   |   |   |
| H |   |   |   |   |

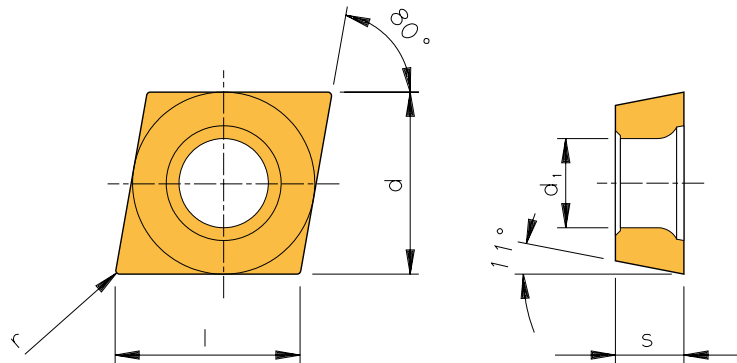
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CPET



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM15C |
|------------------------------------|-----|----------------|----------------|-------------|
| CPET 05T102FR                      | 0,2 | 0,02 - 0,05    | 0,08 - 1,5     | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K | ○ |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

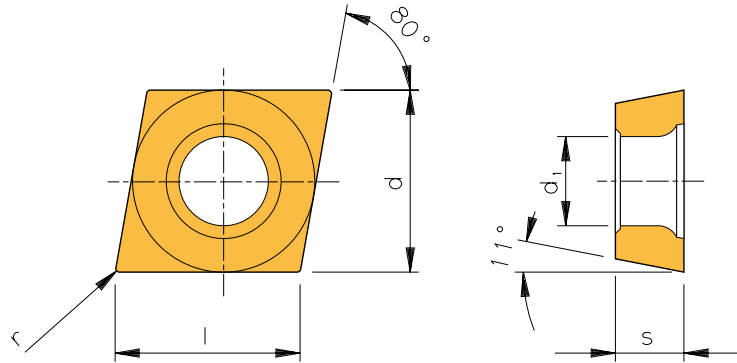
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CPGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      | CU   | HC    |        | HC  |      |      |      | HU   | HU   |      |
|------------------------------------|------|----------------|----------------|------|------|------|-------|--------|-----|------|------|------|------|------|------|
|                                    |      |                |                | AL10 | AL20 | ACE6 | AM15C | AM5025 | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 |
| CPGT 05T101FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,10 - 1,5     | ◆    | ◆    |      |       |        |     | ◆    | ◆    |      |      | ◆    | ◆    |
| CPGT 05T102EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     |      |      |      |       | ◆      |     |      |      |      |      |      | ◆    |
| CPGT 05T102FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     | ◆    | ◆    |      |       |        |     | ◆    | ◆    |      |      | ◆    | ◆    |
| CPGT 05T104EN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     |      |      |      |       | ◆      |     |      |      |      |      | ◆    | ◆    |
| CPGT 05T104FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     | ◆    | ◆    |      |       |        |     | ◆    | ◆    |      |      | ◆    | ◆    |
| CPGT 05T1005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,10 - 1,5     |      |      | ◆    |       |        |     |      | ◆    |      |      | ◆    | ◆    |
| CPGT 05T102EN                      | 0,20 | 0,02 - 0,05    | 0,08 - 1,5     |      |      | ◆    | ◆     |        |     |      |      |      |      |      |      |
| CPGT 05T104EN                      | 0,40 | 0,02 - 0,05    | 0,08 - 1,5     |      |      | ◆    | ◆     |        |     |      |      |      |      |      |      |
| CPGT 05T101FN-ALU                  | 0,10 | 0,04 - 0,10    | 0,10 - 1,5     |      |      |      |       |        |     |      | ◆    |      |      | ◆    |      |
| CPGT 05T102FN-ALU                  | 0,20 | 0,04 - 0,10    | 0,20 - 1,5     | ◆    | ◆    |      |       |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| CPGT 05T104FN-ALU                  | 0,40 | 0,04 - 0,10    | 0,40 - 1,5     | ◆    | ◆    |      |       |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| CPGT 05T1005FN-ALU                 | 0,05 | 0,04 - 0,10    | 0,10 - 1,5     |      |      |      |       |        | ◆   | ◆    |      | ◆    |      | ◆    | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ○ | ○ |  | ○ | ○ | ○ | ○ |   |   |   |   |   |
| M | ○ | ○ | ● | ● | ● |  | ○ | ○ | ○ | ○ |   |   |   |   |   |
| K | ● | ● | ○ | ● | ○ |  |   |   | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |  | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| S | ○ | ○ |   |   | ● |  | ○ | ○ | ○ | ○ |   |   |   | ○ | ○ |
| H |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |

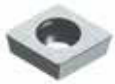
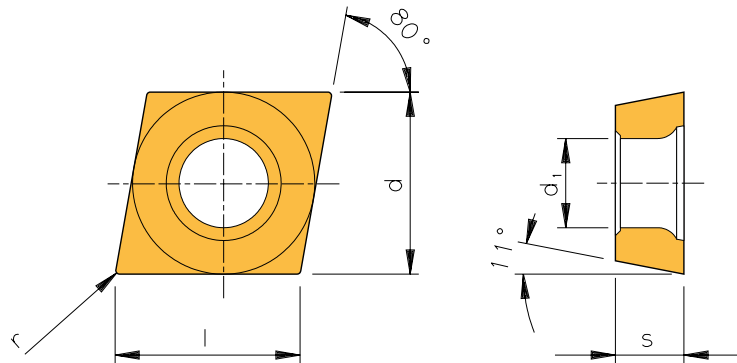
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CPGW



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM15C |
|------------------------------------|-----|----------------|----------------|-------------|
| <b>CPGW 05T102EN</b>               | 0,2 | 0,02 - 0,05    | 0,08 - 2       | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K | ○ |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

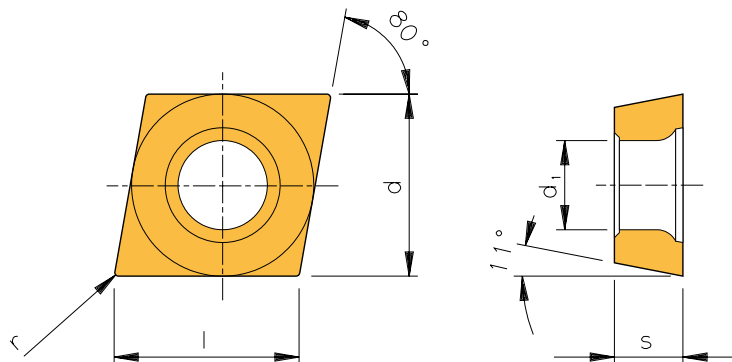
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## CPMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | CU     | HC     |
|------------------------------------|-----|----------------|----------------|--------|--------|
|                                    |     |                |                | AP6010 | AM5130 |
| CPMT 05T102EN-PM1                  | 0,2 | 0,08 - 0,20    | 0,4 - 1,5      | ◆      | ◆      |
| CPMT 05T104EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,4 - 1,5      | ◆      | ◆      |
|                                    |     |                |                |        |        |
|                                    |     |                |                |        |        |
| CPMT 05T102EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,1 - 1,0      | ◆      | ◆      |
| CPMT 05T104EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      | ◆      | ◆      |
|                                    |     |                |                |        |        |
|                                    |     |                |                |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

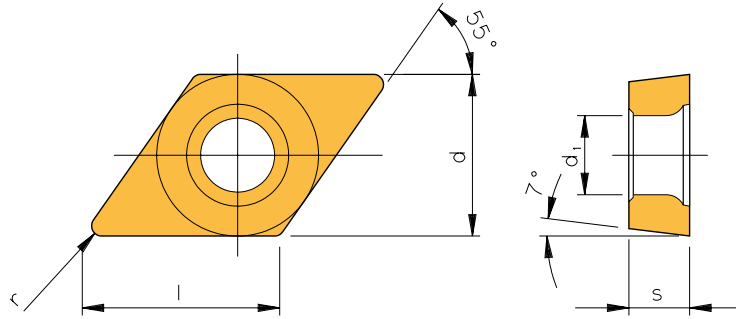
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ○ | ○ |
| K | ○ | ○ |
| N |   | ● |
| S |   | ● |
| H |   | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# Indexable inserts ISO Indexable inserts

Inserti a fissaggio meccanico Inserti a fissaggio meccanico-ISO  
 Plaquettes de coupe amovibles Plaquettes de coupe amovibles ISO

## DCFT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HU<br>AK10 |
|------------------------------------|-----|----------------|----------------|------------|
| DCFT 070202FN-ASF                  | 0,2 | 0,05 - 0,12    | 0,2 - 2        | ◆          |
|                                    |     |                |                |            |
|                                    |     |                |                |            |

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K | ○ |
| N | ● |
| S | ○ |
| H |   |

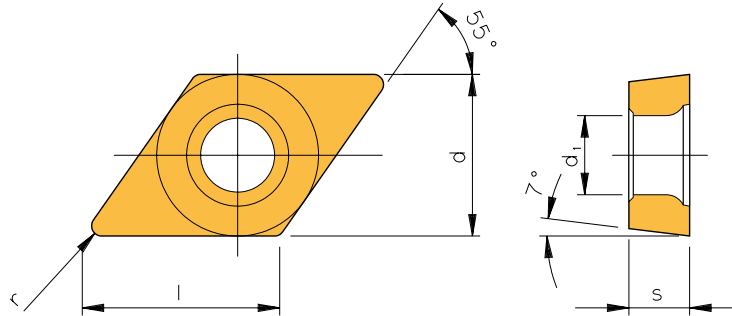
● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DCGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   | HC     |        |        |        |        |         |  |  |  |   |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|--|--|--|---|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |  |  |  |   |
| DCGT 04T002EN                      | 0,20 | 0,02 - 0,06    | 0,1 - 1,0      |      |      |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 070202EN                      | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        | ◆    |        |        |        |        |        |         |  |  |  |   |
| DCGT 070204EN                      | 0,40 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        | ◆    |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T302EN                      | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        | ◆    | ◆      |        |        |        |        |         |  |  |  |   |
| DCGT 11T304EN                      | 0,40 | 0,05 - 0,16    | 0,1 - 1,5      |      |      |        | ◆      | ◆    | ◆      |        |        |        |        |         |  |  |  |   |
| DCGT 070204FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,6 - 2,5      | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T304EN-ACB                  | 0,40 | 0,08 - 0,25    | 0,6 - 3,0      |      |      |        |        |      |        |        |        |        |        |         |  |  |  | ◆ |
| DCGT 11T304FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,6 - 3,0      | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T308EN-ACB                  | 0,80 | 0,10 - 0,30    | 0,8 - 3,5      |      |      |        |        |      |        |        |        |        |        |         |  |  |  | ◆ |
| DCGT 11T308FN-ACB                  | 0,80 | 0,10 - 0,30    | 0,8 - 3,5      | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 0702005FN-ALU                 | 0,05 | 0,02 - 0,06    | 0,5 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 070201FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,5 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 070202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,5 - 2,0      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 070204FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,6 - 2,5      | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T301FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,5 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T302FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,5 - 2,0      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T304FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,6 - 3,0      | ◆    | ◆    | ◆      |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T308FN-ALU                  | 0,80 | 0,10 - 0,30    | 0,8 - 3,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T312FN-ALU                  | 1,20 | 0,10 - 0,30    | 0,8 - 3,5      |      |      |        |        |      |        |        |        |        |        |         |  |  |  |   |
| DCGT 11T3005FN-ALU                 | 0,05 | 0,02 - 0,06    | 0,5 - 1,5      |      |      |        |        |      |        |        |        |        |        |         |  |  |  |   |



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   |        | HC     |        |        |        |         |   |  |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|---|--|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |   |  |
| DCGT 0702005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 0702008FN-ASF                 | 0,08 | 0,02 - 0,06    | 0,1 - 1,5      |      |      |        |        |      |        |        |        |        | ◆      |         |   |  |
| DCGT 070201EN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      |      |      |        |        |      |        |        |        | ◆      |        |         |   |  |
| DCGT 070201FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 0702015EN-ASF                 | 0,15 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        | ◆      | ◆      |         |   |  |
| DCGT 0702015FN-ASF                 | 0,15 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        |        | ◆      |         |   |  |
| DCGT 070202EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        | ◆      | ◆      | ◆       |   |  |
| DCGT 070202FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      | ◆    | ◆    |        |        |      |        |        |        |        |        |         | ◆ |  |
| DCGT 070204EN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      |      |      |        |        |      |        |        |        | ◆      | ◆      | ◆       |   |  |
| DCGT 070204FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         | ◆ |  |
| DCGT 11T301EN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      |      |      |        |        |      |        |        |        | ◆      |        |         |   |  |
| DCGT 11T301FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T302EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        | ◆      | ◆      | ◆       |   |  |
| DCGT 11T302FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T304EN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      |      |      |        |        |      |        |        |        | ◆      | ◆      | ◆       |   |  |
| DCGT 11T304FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         | ◆ |  |
| DCGT 11T308EN-ASF                  | 0,80 | 0,10 - 0,30    | 0,3 - 3,0      |      |      |        |        |      |        |        |        | ◆      |        | ◆       |   |  |
| DCGT 11T308FN-ASF                  | 0,80 | 0,10 - 0,30    | 0,3 - 3,0      | ◆    | ◆    |        |        |      |        |        |        |        |        |         | ◆ |  |
| DCGT 11T3005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T3008FN-ASF                 | 0,08 | 0,02 - 0,06    | 0,1 - 1,5      |      |      |        |        |      |        |        |        |        |        | ◆       |   |  |
| DCGT 11T3015EN-ASF                 | 0,15 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        | ◆      |        |         |   |  |
| DCGT 11T3015FN-ASF                 | 0,15 | 0,05 - 0,12    | 0,2 - 2,0      |      |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T3035EN-ASF                 | 0,35 | 0,08 - 0,25    | 0,2 - 2,5      |      |      |        |        |      |        |        |        | ◆      |        |         |   |  |
| DCGT 070202FN-AWI                  | 0,20 | 0,10 - 0,30    | 0,3 - 3,0      | ◆    |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 070204FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,5 - 4,0      | ◆    |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 070208FN-AWI                  | 0,80 | 0,15 - 0,50    | 0,5 - 4,0      | ◆    |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T302FN-AWI                  | 0,20 | 0,10 - 0,30    | 0,3 - 3,0      | ◆    |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T304FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,5 - 4,0      | ◆    |      |        |        |      |        |        |        |        |        |         |   |  |
| DCGT 11T308FN-AWI                  | 0,80 | 0,15 - 0,50    | 0,5 - 4,0      | ◆    |      |        |        |      |        |        |        | ◆      |        |         |   |  |
| DCGT 070201FN-AZ                   | 0,10 | 0,08 - 0,22    | 1,0 - 3,0      |      |      |        |        |      |        | ◆      |        |        |        |         |   |  |
| DCGT 070202FN-AZ                   | 0,20 | 0,08 - 0,22    | 1,0 - 3,0      |      |      |        |        |      |        | ◆      |        |        |        |         |   |  |
| DCGT 070204FN-AZ                   | 0,40 | 0,08 - 0,22    | 1,0 - 3,0      |      |      |        |        |      |        | ◆      |        |        |        |         |   |  |
| DCGT 11T302FN-AZ                   | 0,20 | 0,10 - 0,35    | 1,5 - 3,8      |      |      |        |        |      |        | ◆      |        |        |        |         |   |  |
| DCGT 11T304FN-AZ                   | 0,40 | 0,10 - 0,35    | 1,5 - 3,8      |      |      |        |        |      |        | ◆      |        |        |        |         |   |  |
| DCGT 11T302FR-FS                   | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        |      | ◆      |        |        |        |        |         |   |  |
| DCGT 11T304FR-FS                   | 0,40 | 0,05 - 0,16    | 0,1 - 1,5      |      |      |        |        |      | ◆      |        |        |        |        |         |   |  |

4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CC     | CU   |        | HC     |        |        |        |         |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|------|--------|--------|--------|--------|--------|---------|
|                                    |      |                |                | AL10 | AL20 | AP5210 | AP6510 | ACE6 | AP6010 | AM5015 | AM5020 | AM5025 | AM5110 | AM5120+ |
| DCGT 0702005FN-PS                  | 0,05 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| DCGT 0702008FN-PS                  | 0,08 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070201EN-PS                   | 0,10 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070201FN-PS                   | 0,10 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| DCGT 0702015FN-PS                  | 0,15 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070202EN-PS                   | 0,20 | 0,04 - 0,10    | 0,1 - 0,6      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070202FN-PS                   | 0,20 | 0,04 - 0,10    | 0,1 - 0,6      |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| DCGT 070204EN-PS                   | 0,40 | 0,06 - 0,18    | 0,3 - 2,0      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070204FN-PS                   | 0,40 | 0,06 - 0,18    | 0,3 - 2,0      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 11T301EN-PS                   | 0,10 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 11T301FN-PS                   | 0,10 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      | ◆      |        | ◆      |        |        |         |
| DCGT 11T302EN-PS                   | 0,20 | 0,04 - 0,10    | 0,1 - 0,6      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 11T302FN-PS                   | 0,20 | 0,04 - 0,10    | 0,1 - 0,6      |      |      |        |        |      | ◆      |        |        |        |        |         |
| DCGT 11T304FN-PS                   | 0,40 | 0,08 - 0,20    | 0,3 - 2,0      |      |      |        |        |      | ◆      |        |        |        |        |         |
| DCGT 11T3005FN-PS                  | 0,05 | 0,02 - 0,06    | 0,1 - 0,5      |      |      | ◆      |        |      | ◆      |        | ◆      |        |        |         |
| DCGT 11T3008FN-PS                  | 0,08 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 11T3015FN-PS                  | 0,15 | 0,02 - 0,06    | 0,1 - 0,5      |      |      |        |        |      |        |        | ◆      |        |        |         |
| DCGT 070202FL-U                    | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        | ◆    | ◆      |        |        |        |        |         |
| DCGT 070202FR-U                    | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        |      | ◆      |        |        |        |        |         |
| DCGT 11T302FL-U                    | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        |      | ◆      |        |        |        |        |         |
| DCGT 11T302FR-U                    | 0,20 | 0,04 - 0,12    | 0,1 - 1,0      |      |      |        |        |      | ◆      |        |        |        |        |         |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| M | ○ | ○ | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ○ | ○ | ○ |
| K | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |   |   | ○ |   |   |   | ○ | ○ | ○ |
| S | ○ | ○ | ● |   |   |   | ● |   | ● | ● | ● | ● | ○ | ○ |
| H |   |   |   |   |   |   |   | ○ |   |   |   | ○ | ○ | ○ |

4



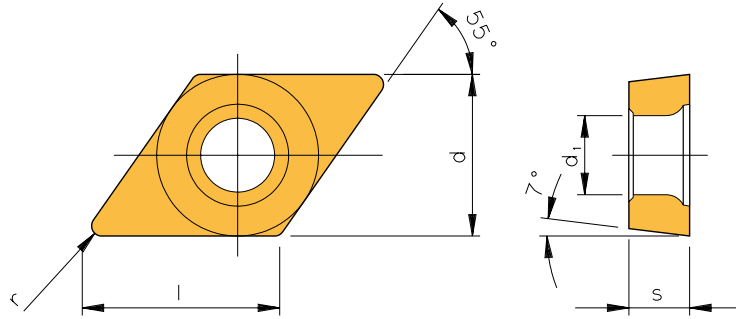




# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DCGW



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| DCGW 070202EN                      | 0,2 | 0,02 - 0,05    | 0,08 - 1,5     | ◆            |
| DCGW 070204EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 1,5     | ◆            |
| DCGW 11T302EN                      | 0,2 | 0,02 - 0,05    | 0,08 - 2,0     | ◆            |
| DCGW 11T304EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 2,0     | ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

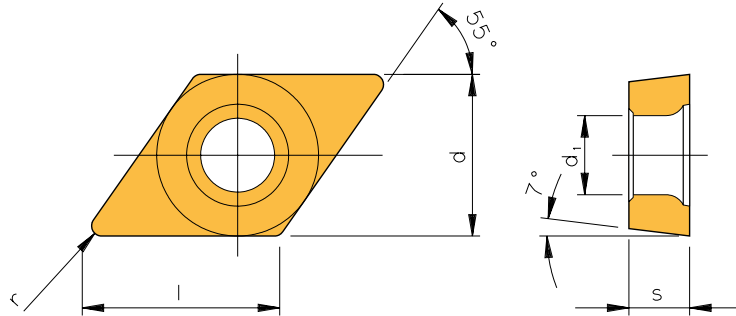
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DCGX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HU   |
|------------------------------------|-----|----------------|----------------|--------|------|
|                                    |     |                |                | AM5025 | AK20 |
| DCGX 070200F L/R                   | 0,0 | 0,02 - 0,04    | 0,04 - 0,6     | ◆      | ◆    |
| DCGX 070201F L/R                   | 0,1 | 0,02 - 0,06    | 0,10 - 1,0     | ◆      | ◆    |
| DCGX 070202F L/R                   | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |
| DCGX 11T300F L/R                   | 0,0 | 0,02 - 0,04    | 0,04 - 0,6     | ◆      | ◆    |
| DCGX 11T301F L/R                   | 0,1 | 0,04 - 0,06    | 0,10 - 1,0     | ◆      | ◆    |
| DCGX 11T302F L/R                   | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆    |
| DCGX 11T304F L/R                   | 0,4 | 0,05 - 0,16    | 0,10 - 1,5     | ◆      | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

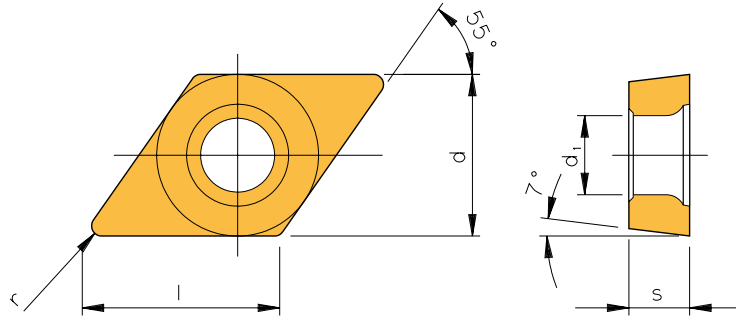
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        | CC     | CU     | HC     |      |        |        | CC     | HC     |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2310 | AP2320 | AP2335 | AP2625 | AP6510 | ACE6 | AP6010 | AM2130 | AM5110 | AM5120 | AM5130 |
| DCMT 070202EN-AM                   | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        |        |        |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 070204EN-AM                   | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     |        | ◆      | ◆      |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 070208EN-AM                   | 0,8 | 0,12 - 0,25    | 0,50 - 2,0     |        | ◆      |        |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 11T302EN-AM                   | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        |        |        |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 11T304EN-AM                   | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     | ◆      | ◆      | ◆      | ◆      |        | ◆    |        | ◆      |        |        |        |
| DCMT 11T308EN-AM                   | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     | ◆      | ◆      | ◆      |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 070202EN-AQ                   | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        |        |        | ◆      |        |      |        |        |        |        |        |
| DCMT 070204EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     |        |        |        | ◆      | ◆      |      |        |        |        |        |        |
| DCMT 11T302EN-AQ                   | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        |        |        | ◆      | ◆      |      |        |        | ◆      |        |        |
| DCMT 11T304EN-AQ                   | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     |        |        |        | ◆      | ◆      |      |        |        |        |        |        |
| DCMT 11T308EN-AQ                   | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     |        |        |        | ◆      | ◆      | ◆    |        |        |        |        |        |
| DCMT 070202EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        | ◆      |        |        |        | ◆    |        |        |        |        |        |
| DCMT 070204EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,40 - 2,0     | ◆      | ◆      |        |        |        | ◆    |        | ◆      | ◆      | ◆      |        |
| DCMT 11T302EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,40 - 2,0     |        | ◆      |        |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 11T304EN-PM1                  | 0,4 | 0,08 - 0,25    | 0,40 - 3,0     | ◆      | ◆      |        |        |        | ◆    |        | ◆      | ◆      | ◆      | ◆      |
| DCMT 11T308EN-PM1                  | 0,8 | 0,12 - 0,32    | 0,50 - 3,0     | ◆      | ◆      |        |        |        | ◆    |        | ◆      |        |        |        |
| DCMT 070204EN-PMC                  | 0,4 | 0,06 - 0,18    | 0,30 - 2,0     |        |        |        | ◆      |        |      |        |        |        |        |        |
| DCMT 11T302EN-PMC                  | 0,2 | 0,04 - 0,16    | 0,28 - 1,8     |        |        |        | ◆      |        |      |        |        |        |        |        |
| DCMT 11T304EN-PMC                  | 0,4 | 0,08 - 0,20    | 0,30 - 2,0     |        |        |        | ◆      |        |      |        |        |        |        |        |
| DCMT 11T304EN-PMS                  | 0,4 | 0,08 - 0,20    | 0,30 - 2,0     |        |        |        |        |        |      |        | ◆      |        |        |        |
| DCMT 070202EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     |        | ◆      |        |        |        | ◆    | ◆      | ◆      |        |        |        |
| DCMT 070204EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,10 - 1,5     | ◆      | ◆      |        |        |        | ◆    | ◆      | ◆      |        |        |        |
| DCMT 11T302EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,10 - 1,0     | ◆      | ◆      |        |        |        | ◆    | ◆      | ◆      |        |        |        |
| DCMT 11T304EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,10 - 1,5     | ◆      | ◆      |        |        |        | ◆    | ◆      | ◆      |        |        |        |



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        | CC     | CU   | HC     |        |        |        | CC     | HC    |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|-------|--------|
|                                    |     |                |                | AP2310 | AP2320 | AP2335 | AP2625 | AP6510 | ACE6 | AP6010 | AM2130 | AM5110 | AM5120 | AM5130 | AC90C | AK2310 |
| DCMT 070202EN-PMT1                 | 0,2 | 0,08 - 0,15    | 0,40 - 1,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |        |       |        |
| DCMT 070204EN-PMT1                 | 0,4 | 0,08 - 0,22    | 0,40 - 2,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |        |       |        |
| DCMT 11T302EN-PMT1                 | 0,2 | 0,08 - 0,15    | 0,40 - 1,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |        |       |        |
| DCMT 11T304EN-PMT1                 | 0,4 | 0,08 - 0,22    | 0,40 - 2,5     |        |        |        |        |        |      |        | ◆      | ◆      | ◆      |        |       |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

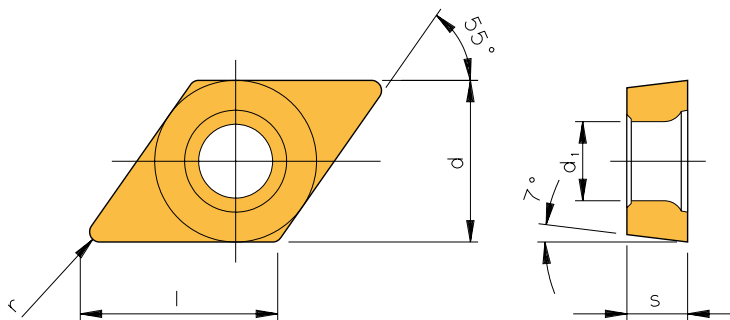
|                         | P | M | K | N | S | H |
|-------------------------|---|---|---|---|---|---|
| ● Main application      | ● | ● | ● | ● | ● | ● |
| ○ Secondary application | ○ | ○ | ○ | ○ | ○ | ○ |

● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DCXT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |
|------------------------------------|-----|----------------|----------------|--------|
|                                    |     |                |                | AM5020 |
| DCXT 070202EN-AEC                  | 0,2 | 0,05 - 0,12    | 0,5 - 2,0      | ◆      |
| DCXT 070204EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 2,5      | ◆      |
| DCXT 11T302EN-AEC                  | 0,2 | 0,05 - 0,12    | 0,5 - 2,0      | ◆      |
| DCXT 11T304EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 3,0      | ◆      |
| DCXT 11T308EN-AEC                  | 0,8 | 0,10 - 0,30    | 0,8 - 3,5      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

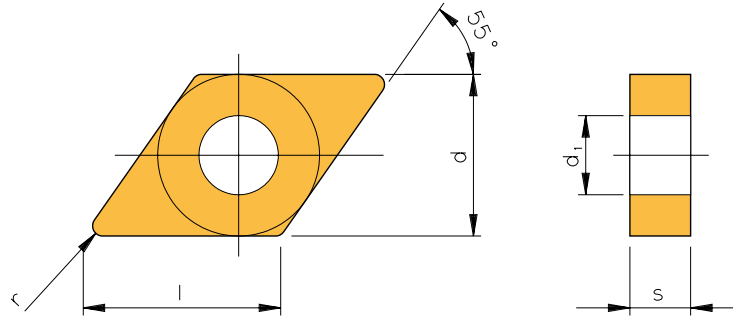
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DNGA



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |
|------------------------------------|-----|----------------|----------------|--------|
|                                    |     |                |                | AH4205 |
| DNGA 150602EN                      | 0,2 | 0,02 - 0,05    | 0,08 - 3       | ◆      |
| DNGA 150604EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆      |
| DNGA 150608EN                      | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

● Main application  
Applicazione principale  
Application principale

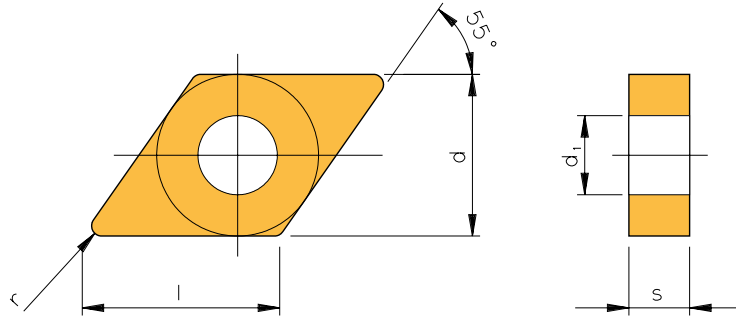
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DNGG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| DNGG 150602EN-NFS                  | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| DNGG 150604EN-NFS                  | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| DNGG 150608EN-NFS                  | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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| K |   |
| N |   |
| S |   |
| H | ● |

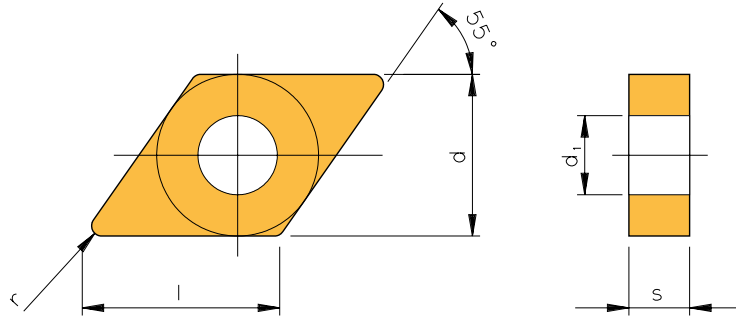
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DNGP



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HU     |
|------------------------------------|-----|----------------|----------------|--------|--------|
|                                    |     |                |                | AM5025 | AK1020 |
| DNGP 110402FN-EX                   | 0,2 | 0,05 - 0,25    | 0,03 - 3,0     | ◆      |        |
| DNGP 110404FN-EX                   | 0,4 | 0,05 - 0,25    | 0,05 - 3,5     | ◆      | ◆      |
| DNGP 150602FN-EX                   | 0,2 | 0,06 - 0,28    | 0,03 - 3,0     | ◆      |        |
| DNGP 150604FN-EX                   | 0,4 | 0,06 - 0,28    | 0,05 - 3,5     | ◆      | ◆      |
| DNGP 150608FN-EX                   | 0,8 | 0,06 - 0,28    | 0,06 - 3,5     | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

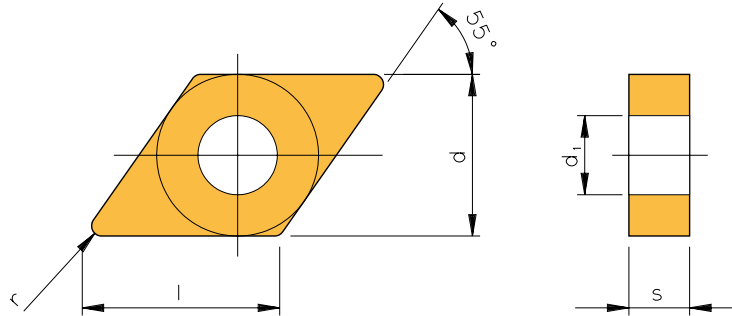
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO


## DNMG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        | CU     | HC     |      |        |        | HC     | HU     | HU     |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2310 | AP2320 | AP2335 | AP2420 | ACE6 | AM2130 | AM5110 | AM5120 | AM5130 | AK2310 |
| <b>DNMG 110404EN-AQ</b>            | 0,4 | 0,08 - 0,25    | 0,4 - 3,0      |        |        |        |        |      |        |        |        |        |        |
| <b>DNMG 150604ER-K</b>             | 0,4 | 0,22 - 0,40    | 1,0 - 3,5      |        | ◆      |        |        |      |        |        |        |        |        |
| <b>DNMG 150608ER-K</b>             | 0,8 | 0,22 - 0,40    | 1,2 - 4,0      |        | ◆      |        |        |      |        |        |        |        |        |
| <b>DNMG 150404EN-NFT</b>           | 0,4 | 0,06 - 0,16    | 0,4 - 1,5      |        |        |        |        | ◆    | ◆      |        |        |        |        |
| <b>DNMG 150408EN-NFT</b>           | 0,8 | 0,08 - 0,19    | 0,5 - 2,0      |        |        |        |        | ◆    | ◆      |        |        |        |        |
| <b>DNMG 150604EN-NFT</b>           | 0,4 | 0,06 - 0,16    | 0,4 - 1,5      |        |        |        | ◆      | ◆    | ◆      |        |        | ◆      | ◆      |
| <b>DNMG 150608EN-NFT</b>           | 0,8 | 0,08 - 0,19    | 0,5 - 2,0      |        |        |        | ◆      | ◆    | ◆      |        |        | ◆      | ◆      |
| <b>DNMG 110404EN-NM2</b>           | 0,4 | 0,10 - 0,18    | 0,5 - 2,0      |        | ◆      |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 110408EN-NM2</b>           | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      |        | ◆      |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150408EN-NM2</b>           | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      |        |        |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150604EN-NM2</b>           | 0,4 | 0,10 - 0,18    | 0,5 - 2,5      |        | ◆      |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150608EN-NM2</b>           | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      |        | ◆      |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150612EN-NM2</b>           | 1,2 | 0,18 - 0,30    | 0,8 - 3,0      |        |        |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 110408EN-NMG1</b>          | 0,8 | 0,18 - 0,35    | 0,8 - 4,0      |        |        |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150608EN-NMG1</b>          | 0,8 | 0,15 - 0,35    | 0,8 - 5,0      |        | ◆      | ◆      | ◆      |      |        |        | ◆      |        |        |
| <b>DNMG 150612EN-NMG1</b>          | 1,2 | 0,20 - 0,55    | 1,0 - 5,0      |        | ◆      |        | ◆      |      |        |        |        |        |        |
| <b>DNMG 150604EN-NMR</b>           | 0,4 | 0,08 - 0,22    | 0,4 - 2,5      |        |        |        | ◆      |      | ◆      |        |        |        |        |
| <b>DNMG 150608EN-NMR</b>           | 0,8 | 0,12 - 0,28    | 0,6 - 4,0      |        |        |        | ◆      |      | ◆      |        |        |        |        |

| Designation<br>Articolo<br>Article  | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        | CU   | HC     |        |        |        | HC     | HU     | HU     |
|---|-----|----------------|----------------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|
|   |     |                |                | AP2310 | AP2320 | AP2335 | AP2420 | ACE6 | AM2130 | AM5110 | AM5120 | AM5130 | AK2310 | AS1010 | AS1020 |
|  DNMG 110404EN-NMT | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |      | ◆      | ◆      | ◆      | ◆      |        |        |        |
| DNMG 110408EN-NMT   | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |      |        |        | ◆      |        |        |        |        |
| DNMG 150404EN-NMT   | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |      |        |        | ◆      |        |        |        |        |
| DNMG 150408EN-NMT   | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |      |        |        | ◆      | ◆      |        |        |        |
| DNMG 150604EN-NMT   | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |      | ◆      | ◆      | ◆      | ◆      |        |        |        |
| DNMG 150608EN-NMT   | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |      | ◆      | ◆      | ◆      | ◆      |        |        |        |
| DNMG 110402EN-NMT1  | 0,2 | 0,08 - 0,15    | 0,4 - 1,5      |        |        |        |        |      |        | ◆      | ◆      |        |        |        |        |
| DNMG 110404EN-NMT1  | 0,4 | 0,08 - 0,22    | 0,4 - 2,5      |        |        |        |        |      |        | ◆      | ◆      |        |        |        |        |
| DNMG 110408EN-NMT1  | 0,8 | 0,12 - 0,28    | 0,6 - 3,2      |        |        |        |        |      |        |        | ◆      |        |        |        |        |
| DNMG 150608EN-NMT1  | 0,8 | 0,12 - 0,28    | 0,6 - 4,0      |        |        |        |        |      | ◆      | ◆      | ◆      |        | ◆      | ◆      |        |
| DNMG 150612EN-NMT1  | 1,2 | 0,15 - 0,30    | 0,8 - 4,0      |        |        |        |        |      | ◆      | ◆      | ◆      |        | ◆      | ◆      |        |
| DNMG 150404EN-NS1   | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |      |        |        |        | ◆      |        |        |        |
| DNMG 150408EN-NS1   | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |      |        |        |        | ◆      |        |        |        |
| DNMG 150604EN-NS1   | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      | ◆      | ◆      |        |        |      |        |        |        |        |        |        |        |
| DNMG 150608EN-NS1   | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        | ◆      |        |        |      |        |        |        |        |        |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● |   | ○ | ○ | ○ | ○ |   |   |
| M |   |   |   |   | ● | ● | ● | ● | ○ |   | ○ | ○ |
| K |   |   |   |   | ○ |   | ○ | ○ | ○ | ● |   |   |
| N |   |   |   |   |   |   | ○ | ○ | ● |   |   |   |
| S |   |   |   |   |   |   | ● | ● | ● |   | ● | ● |
| H |   |   |   |   |   |   | ○ | ○ | ○ |   |   |   |

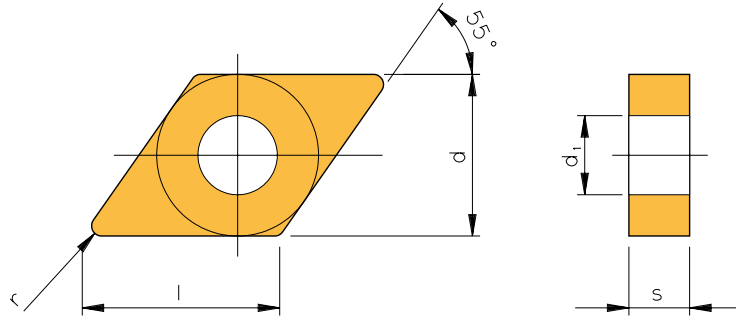
● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## DNMP



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM25C |
|------------------------------------|-----|----------------|----------------|-------------|
| DNMP 150604ER                      | 0,4 | 0,2 - 0,6      | 0,5 - 5        | ◆           |
| DNMP 150608ER                      | 0,8 | 0,2 - 0,6      | 0,5 - 5        | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S |   |
| H |   |

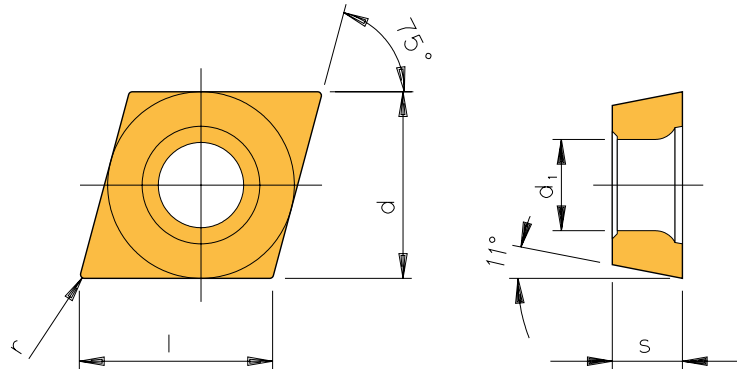
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## EPMT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM25C |
|------------------------------------|-----|----------------|----------------|-------------|
| <b>EPMT 08M304EN</b>               | 0,4 | 0,02 - 0,05    | 0,08 - 1,5     | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

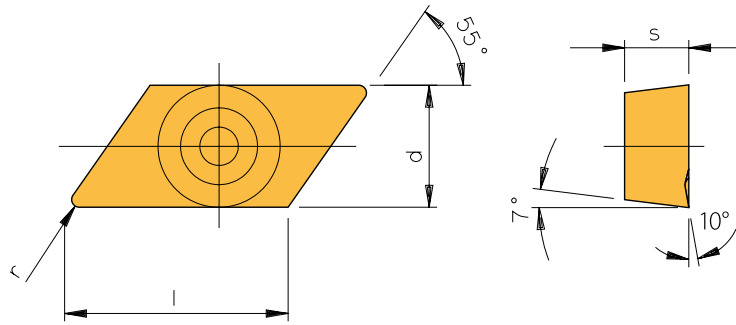
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

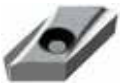
# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## KCGX



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM35C | HU<br>AK10 |
|------------------------------------|-----|----------------|----------------|-------------|------------|
| KCGX 110302E L/R                   | 0,2 | 0,20 - 0,6     | 0,5 - 5        | ◆           |            |
| KCGX 110302F L/R                   | 0,2 | 0,20 - 0,6     | 0,5 - 5        |             | ◆          |
| KCGX 110304E L/R                   | 0,4 | 0,20 - 0,6     | 0,5 - 5        | ◆           |            |
| KCGX 110308E L/R                   | 0,8 | 0,20 - 0,6     | 0,5 - 5        | ◆           |            |
| KCGX 110302FL-18                   | 0,2 | 0,15 - 0,5     | 0,5 - 6        |             | ◆          |
| KCGX 110302FR-18                   | 0,2 | 0,15 - 0,5     | 0,5 - 6        |             | ◆          |
| KCGX 110304FL-18                   | 0,4 | 0,15 - 0,5     | 0,5 - 6        |             | ◆          |
| KCGX 110304FR-18                   | 0,4 | 0,15 - 0,5     | 0,5 - 6        |             | ◆          |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

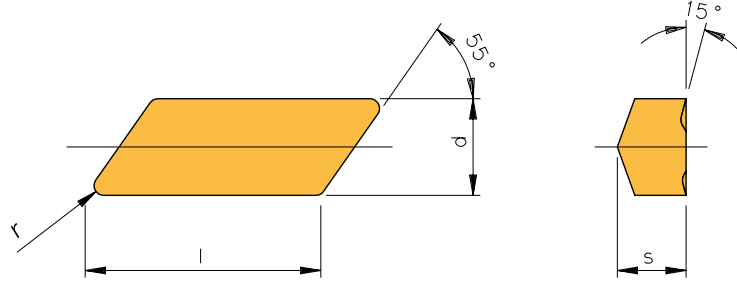
|   |   |   |
|---|---|---|
| P | ● |   |
| M | ○ |   |
| K |   | ○ |
| N |   | ● |
| S |   | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## KNMX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM35C |
|------------------------------------|-----|----------------|----------------|-------------|
| <b>KNMX 190504ER</b>               | 0,4 | 0,20 - 0,6     | 0,5 - 5        | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
| <b>KNMX 190504EL-A</b>             | 0,4 | 0,15 - 0,5     | 0,5 - 6        | ◆           |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ○ |
| K |   |
| N |   |
| S |   |
| H |   |

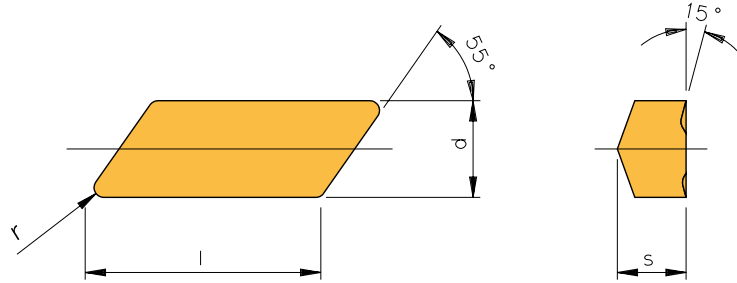
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## KNUX



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AP2025 |
|------------------------------------|-----|----------------|----------------|--------------|
| <b>KNUX 160405ER-N11</b>           | 0,5 | 0,2 - 0,6      | 0,5 - 5        | ◆            |
|                                    |     |                |                |              |
|                                    |     |                |                |              |
|                                    |     |                |                |              |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ○ |
| K | ● |
| N |   |
| S | ○ |
| H |   |

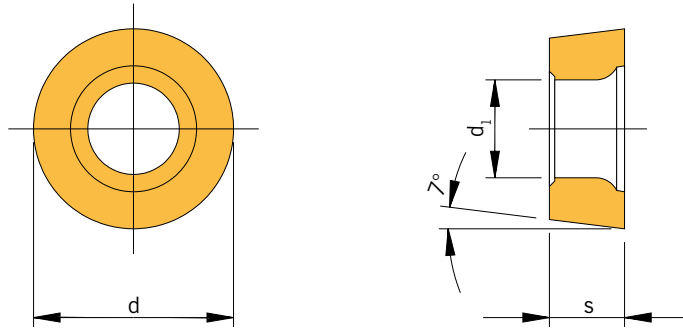
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## RCGT



| Designation<br>Articolo<br>Article | $f_n$       | $a_p$     | HC   |      |        | HC  |      |      |      | HU   |      |      |
|------------------------------------|-------------|-----------|------|------|--------|-----|------|------|------|------|------|------|
|                                    |             |           | AL10 | AL20 | AP5210 | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 |
| RCGT 0602MOFN-ACB                  | 0,10 - 0,55 | 0,6 - 2,5 | ◆    | ◆    |        | ◆   |      |      | ◆    |      | ◆    | ◆    |
| RCGT 0803MOFN-ACB                  | 0,12 - 0,60 | 0,7 - 3,0 | ◆    | ◆    |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| RCGT 10T3MOFN-ACB                  | 0,15 - 0,70 | 0,8 - 4,0 |      |      |        | ◆   |      | ◆    |      |      | ◆    | ◆    |
| RCGT 1003MOFN-ACB                  | 0,15 - 0,70 | 0,8 - 4,0 | ◆    | ◆    |        | ◆   | ◆    |      |      |      | ◆    | ◆    |
| RCGT 1204MOFN-ACB                  | 0,18 - 0,80 | 1,0 - 5,0 |      |      | ◆      | ◆   | ◆    |      | ◆    |      | ◆    | ◆    |
| RCGT 10T3MOEN-ALU                  | 0,15 - 0,70 | 0,8 - 4,0 |      |      | ◆      |     |      |      |      |      | ◆    |      |
| RCGT 1003MOFN-ALU                  | 0,15 - 0,70 | 0,8 - 4,0 | ◆    | ◆    |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| RCGT 1204MOFN-ALU                  | 0,18 - 0,80 | 1,0 - 5,0 | ◆    |      |        | ◆   | ◆    | ◆    | ◆    |      | ◆    | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |   |   |   |   |   |   |  |   |   |
|---|---|---|---|---|---|---|---|---|--|---|---|
| P | ● | ● | ● |   | ○ | ○ | ○ | ○ |  |   |   |
| M | ○ | ○ | ● |   | ○ | ○ | ○ | ○ |  |   |   |
| K | ● | ● | ○ |   | ○ | ○ | ○ | ○ |  | ○ | ○ |
| N |   |   |   | ● | ● | ● | ● | ● |  | ● | ● |
| S | ○ | ○ | ● |   | ○ | ○ | ○ | ○ |  | ○ | ○ |
| H |   |   |   |   |   |   |   |   |  |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

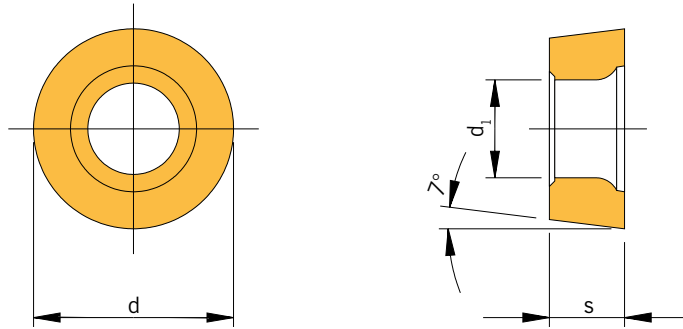
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## RCMT



4



| Designation<br>Articolo<br>Article | $f_n$       | $a_p$     | HC     |        |        |        |
|------------------------------------|-------------|-----------|--------|--------|--------|--------|
|                                    |             |           | AP2320 | AP2335 | AM2130 | AM5120 |
| RCMT 0602MOEN-AM                   | 0,06 - 0,35 | 0,4 - 2,0 | ◆      | ◆      |        |        |
| RCMT 0803MOEN-AM                   | 0,08 - 0,45 | 0,6 - 2,5 | ◆      | ◆      | ◆      |        |
| RCMT 1003MOEN-AM                   | 0,10 - 0,60 | 0,8 - 3,5 | ◆      | ◆      |        | ◆      |
| RCMT 1204MOEN-AM                   | 0,10 - 0,80 | 1,0 - 4,0 | ◆      | ◆      |        | ◆      |
| RCMT 1606MOEN-AM                   | 0,12 - 1,00 | 1,4 - 5,0 | ◆      | ◆      |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● | ● |   | ○ |
| M |   |   | ● | ● |
| K |   |   |   | ○ |
| N |   |   |   | ○ |
| S |   |   |   | ● |
| H |   |   |   | ○ |

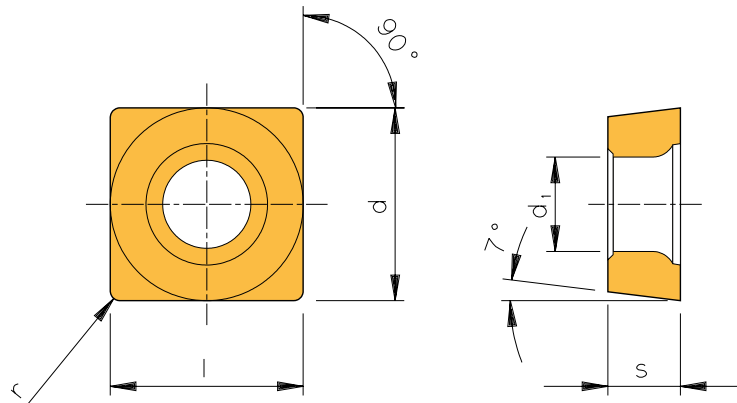
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SCGT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC   |      | HC  |      |      |      | HU   |      |
|------------------------------------|-----|----------------|----------------|------|------|-----|------|------|------|------|------|
|                                    |     |                |                | AL10 | AL20 | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 |
| SCGT 09T304FN-ALU                  | 0,4 | 0,08 - 0,25    | 0,6 - 4        | ◆    | ◆    | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    |
| SCGT 09T308FN-ALU                  | 0,8 | 0,10 - 0,35    | 0,7 - 4        | ◆    | ◆    | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    |
| SCGT 120404FN-ALU                  | 0,4 | 0,10 - 0,40    | 0,4 - 6        | ◆    | ◆    | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    |
| SCGT 120412FN-ALU                  | 1,2 | 0,10 - 0,40    | 1,0 - 6        | ◆    | ◆    | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    |
| SCGT 120416FN-ALU                  | 1,6 | 0,10 - 0,40    | 1,2 - 6        | ◆    | ◆    | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ○ | ○ | ○ | ○ |   |   |
| M | ○ | ○ |   | ○ | ○ | ○ | ○ |   |
| K | ● | ● |   | ○ | ○ | ○ | ○ | ○ |
| N |   |   | ● | ● | ● | ● | ● | ● |
| S | ○ | ○ |   | ○ | ○ | ○ | ○ | ○ |
| H |   |   |   |   |   |   |   |   |

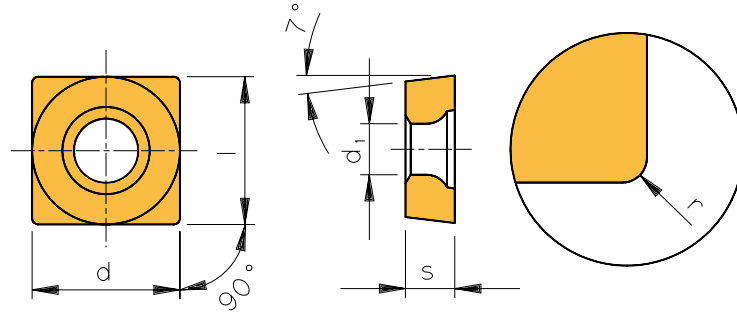
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2035 | AP2310 | AP2320 | AP2335 | AM2035 | AM2130 | AM5120 |
| SCMT 09T304EN-AM                   | 0,4 | 0,08 - 0,25    | 0,4 - 3,0      |        |        | ◆      | ◆      |        | ◆      | ◆      |
| SCMT 09T308EN-AM                   | 0,8 | 0,12 - 0,32    | 0,5 - 3,0      |        |        | ◆      | ◆      |        | ◆      |        |
| SCMT 120404EN-AM                   | 0,4 | 0,08 - 0,25    | 0,4 - 3,0      | ◆      |        |        |        |        | ◆      |        |
| SCMT 120408EN-AM                   | 0,8 | 0,12 - 0,32    | 0,5 - 3,5      |        | ◆      | ◆      | ◆      |        | ◆      | ◆      |
| SCMT 120408EN-PMS                  | 0,8 | 0,12 - 0,32    | 0,5 - 2,5      | ◆      |        |        |        |        |        |        |
| SCMT 120412EN-PMS                  | 1,2 | 0,12 - 0,32    | 0,5 - 2,5      | ◆      |        |        |        |        |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

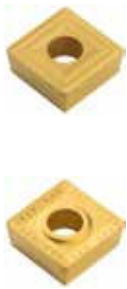
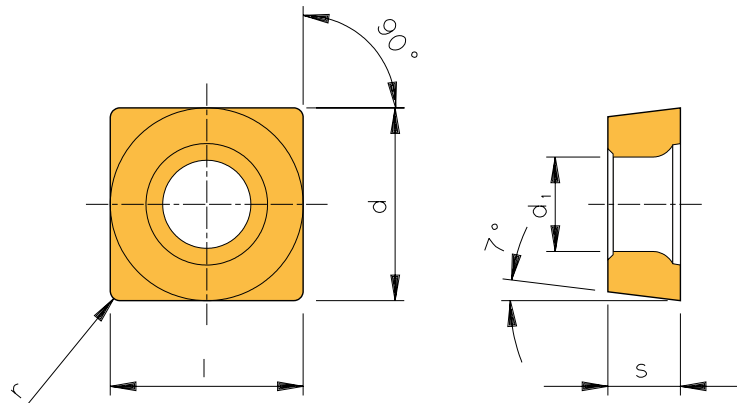
|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ○ | ○ |
| M | ○ |   |   |   | ● | ● |
| K |   |   |   |   |   | ○ |
| N |   |   |   |   |   | ○ |
| S | ○ |   |   |   | ● | ● |
| H |   |   |   |   |   | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SCMX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC              |                |
|------------------------------------|-----|----------------|----------------|-----------------|----------------|
|                                    |     |                |                | AP2025<br>AR27C | AM35C<br>AM350 |
| SCMX 120408EN                      | 0,8 | 0,12 - 0,32    | 0,5 - 2,5      | ◆               | ◆              |
| SCMX 190612EN                      | 1,2 | 0,12 - 0,32    | 0,5 - 2,5      | ◆               |                |
| SCMX 120408EN-AM                   | 0,8 | 0,12 - 0,32    | 0,5 - 3,5      |                 | ◆ ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● | ○ | ● | ○ |
| M | ○ | ○ | ○ | ● |
| K | ● | ● |   |   |
| N |   |   |   |   |
| S | ○ |   |   | ○ |
| H |   |   |   |   |

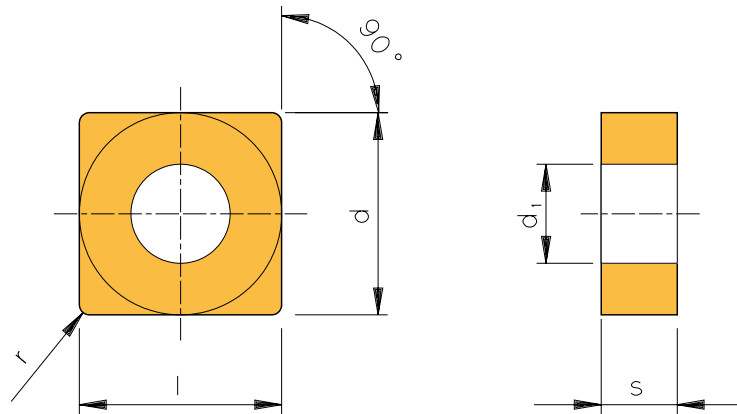
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SNGA



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| SNGA 120404EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| SNGA 120408EN                      | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
|                                    |     |                |                |              |
|                                    |     |                |                |              |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

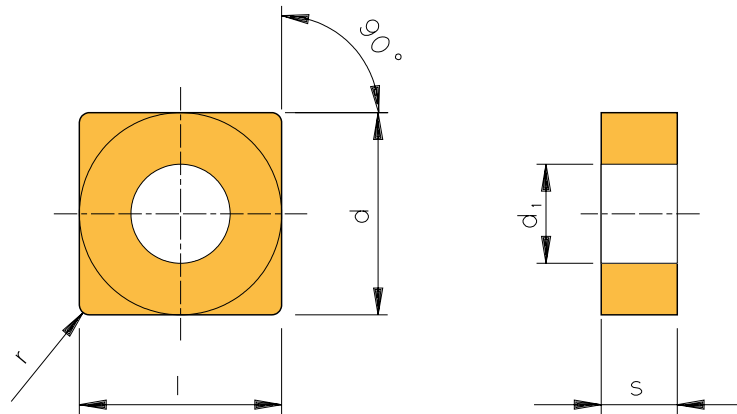
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SNMG



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>b</sub> | HC     |        |        |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 | AM2130 | AM5110 | AK2110 |
| SNMG 120408EN-NM2                  | 0,8 | 0,15 - 0,25    | 0,8 - 3        | ◆      |        |        | ◆      | ◆      |        |
| SNMG 120408EN-NMG1                 | 0,8 | 0,20 - 0,50    | 0,8 - 5        | ◆      | ◆      |        | ◆      |        |        |
| SNMG 120412EN-NMG1                 | 1,2 | 0,25 - 0,65    | 1,0 - 6        |        | ◆      | ◆      | ◆      |        | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| P | ● | ● | ● |   | ○ | ○ |
| M |   |   |   | ● | ● |   |
| K |   |   |   |   | ○ | ● |
| N |   |   |   |   | ○ |   |
| S |   |   |   |   | ● |   |
| H |   |   |   |   | ○ |   |

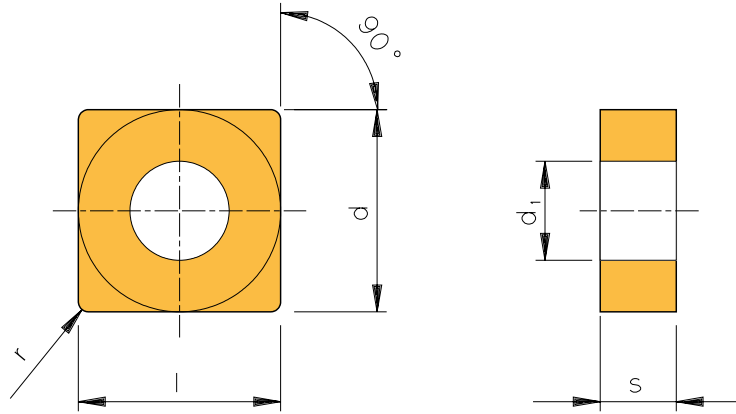
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SNMM



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC          |
|------------------------------------|-----|----------------|----------------|-------------|
| SNMM 190616EN-NR1                  | 1,6 | 0,25 - 1,2     | 0,8 - 12       | AM5130<br>◆ |
|                                    |     |                |                |             |
|                                    |     |                |                |             |
|                                    |     |                |                |             |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ○ |
| K | ○ |
| N | ● |
| S | ● |
| H | ○ |

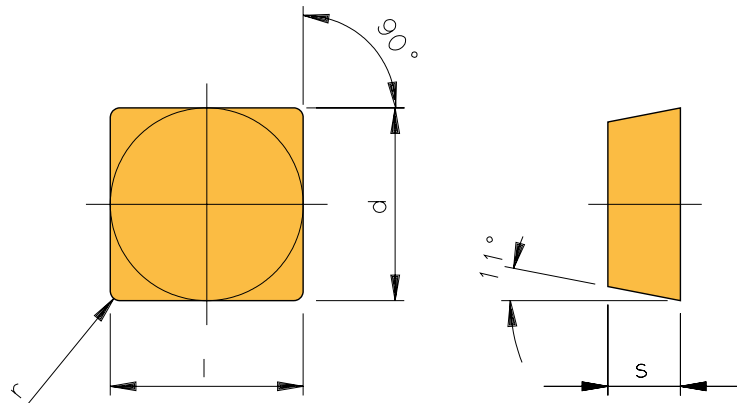
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## SPMR



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HC    |
|------------------------------------|-----|----------------|----------------|--------|-------|
|                                    |     |                |                | AP2025 | AM35C |
| SPMR 120304EN                      | 0,4 | 0,12 - 0,32    | 0,5 - 2,5      | ◆      |       |
| SPMR 120308EL                      | 0,8 | 0,12 - 0,32    | 0,5 - 2,5      |        | ◆     |
| SPMR 120308EN                      | 0,8 | 0,12 - 0,32    | 0,5 - 2,5      |        | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ● |
| M | ○ | ○ |
| K | ● |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

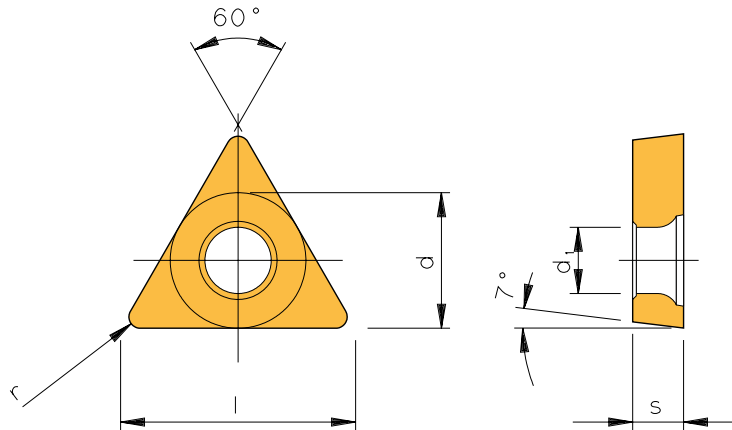
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TCGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      | HC     |        | HC  |      |      |      | HU   |      |      |
|------------------------------------|------|----------------|----------------|------|------|--------|--------|-----|------|------|------|------|------|------|
|                                    |      |                |                | AL10 | AL20 | AM5015 | AM5025 | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 |
| TCGT 16T304FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,6 - 4,0      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 110204FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,6 - 3,0      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    |      |      |      | ◆    |
| TCGT 06T101FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,5 - 1,0      | ◆    | ◆    |        |        |     |      | ◆    |      |      |      | ◆    |
| TCGT 06T102FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,6 - 1,2      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 090202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,6 - 1,6      | ◆    | ◆    |        |        |     | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 090204FN-ALU                  | 0,40 | 0,08 - 0,16    | 0,6 - 1,6      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 090208FN-ALU                  | 0,80 | 0,08 - 0,16    | 0,6 - 1,6      |      |      |        |        |     |      |      |      |      |      | ◆    |
| TCGT 16T301FN-ALU                  | 0,10 | 0,05 - 0,12    | 0,5 - 2,0      | ◆    | ◆    |        |        | ◆   |      | ◆    |      |      |      | ◆    |
| TCGT 16T302FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,5 - 2,0      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 16T304FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,6 - 4,0      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 16T308FN-ALU                  | 0,80 | 0,10 - 0,35    | 0,8 - 4,0      | ◆    | ◆    |        |        |     | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 110201FN-ALU                  | 0,10 | 0,02 - 0,06    | 0,5 - 1,5      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    |      |      |      | ◆    |
| TCGT 110202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,6 - 2,0      | ◆    | ◆    |        |        |     | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 110204FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,6 - 3,0      | ◆    | ◆    |        |        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |
| TCGT 06T102FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      | ◆    | ◆    |        |        |     |      |      |      |      |      | ◆    |
| TCGT 090202EN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      |      |      | ◆      | ◆      |     |      |      |      |      |      | ◆    |
| TCGT 16T301FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |     |      | ◆    |      |      |      | ◆    |
| TCGT 16T302FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      | ◆    | ◆    |        |        |     |      | ◆    |      |      |      | ◆    |
| TCGT 16T304FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      | ◆    | ◆    |        |        |     |      | ◆    |      |      |      | ◆    |
| TCGT 110201FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    | ◆    |        |        |     |      | ◆    |      |      |      | ◆    |
| TCGT 110202FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,2 - 2,0      | ◆    | ◆    |        |        |     | ◆    | ◆    |      |      |      | ◆    |
| TCGT 110204FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,2 - 2,5      | ◆    | ◆    |        |        |     | ◆    | ◆    |      |      |      | ◆    |
| TCGT 1102005FN-ASF                 | 0,05 | 0,02 - 0,06    | 0,1 - 1,5      | ◆    |      |        |        |     |      |      |      |      |      | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

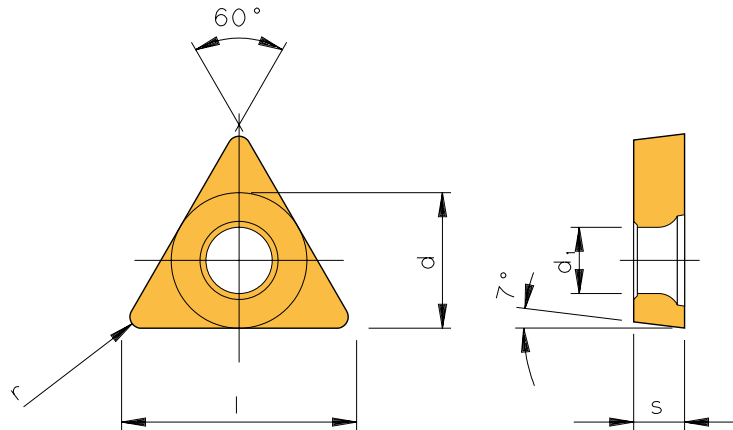
|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ○ |   | ○ | ○ | ○ | ○ |   |   |
| M | ○ | ○ | ● | ● |   | ○ | ○ | ○ | ○ |   |   |
| K | ● | ● | ○ | ○ |   | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   | ○ |   | ● | ● | ● | ● | ● | ● | ● |
| S | ○ | ○ | ● | ● |   | ○ | ○ | ○ | ○ | ○ | ○ |
| H |   |   | ○ |   |   |   |   |   |   |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TCGW



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | Material |
|------------------------------------|-----|----------------|----------------|----------|
| TCGW 090204FN                      | 0,4 | 0,02 - 0,05    | 0,08 - 3       | HU       |
| TCGW 110202FN                      | 0,2 | 0,02 - 0,05    | 0,08 - 3       | AK1020   |
|                                    |     |                |                | ◆        |
|                                    |     |                |                | ◆        |
|                                    |     |                |                |          |
|                                    |     |                |                |          |



HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K | ○ |
| N | ● |
| S | ○ |
| H |   |

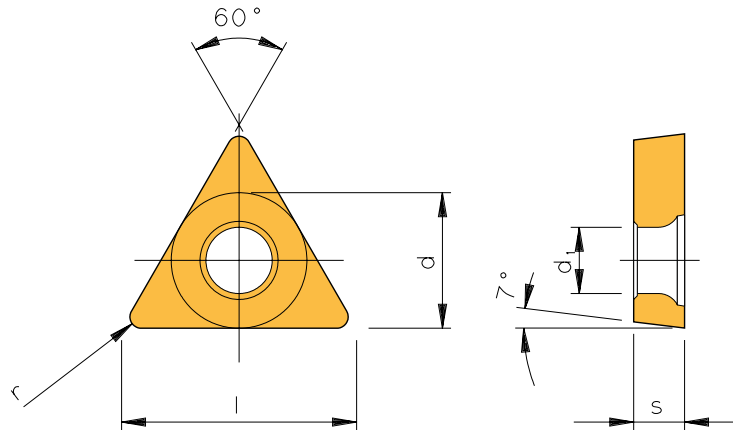
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        | CU   |        | HC    |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|------|--------|-------|--------|--------|--------|
|                                    |     |                |                | AP2035 | AP2310 | AP2320 | AP2335 | ACE6 | AP6010 | AM350 | AM2035 | AM2130 | AM5120 |
| TCMT 06T104EN-AM                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        |        |        |      |        | ◆     |        |        |        |
| TCMT 16T304EN-AM                   | 0,4 | 0,08 - 0,25    | 0,4 - 3,0      |        |        | ◆      | ◆      |      |        |       |        | ◆      | ◆      |
| TCMT 16T308EN-AM                   | 0,8 | 0,12 - 0,32    | 0,5 - 3,0      |        |        | ◆      | ◆      |      |        |       |        | ◆      | ◆      |
| TCMT 110204EN-AM                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        | ◆      | ◆      | ◆      |      |        |       |        | ◆      | ◆      |
| TCMT 110208EN-AM                   | 0,8 | 0,12 - 0,30    | 0,5 - 2,0      | ◆      |        |        |        |      |        |       | ◆      |        |        |
| TCMT 110204EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        |        |        |      | ◆      |       |        |        |        |
| TCMT 110208EN-AQ                   | 0,8 | 0,12 - 0,30    | 0,5 - 2,0      |        |        |        |        | ◆    |        |       |        |        |        |
| TCMT 16T304EN-PM1                  | 0,4 | 0,08 - 0,25    | 0,4 - 3,0      |        |        | ◆      |        |      |        |       |        | ◆      | ◆      |
| TCMT 16T308EN-PM1                  | 0,8 | 0,12 - 0,32    | 0,5 - 3,0      |        |        | ◆      |        |      |        |       |        | ◆      | ◆      |
| TCMT 110202EN-PM1                  | 0,2 | 0,08 - 0,20    | 0,4 - 1,5      |        |        | ◆      |        |      |        |       |        |        |        |
| TCMT 110204EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        | ◆      |        | ◆    |        |       |        | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

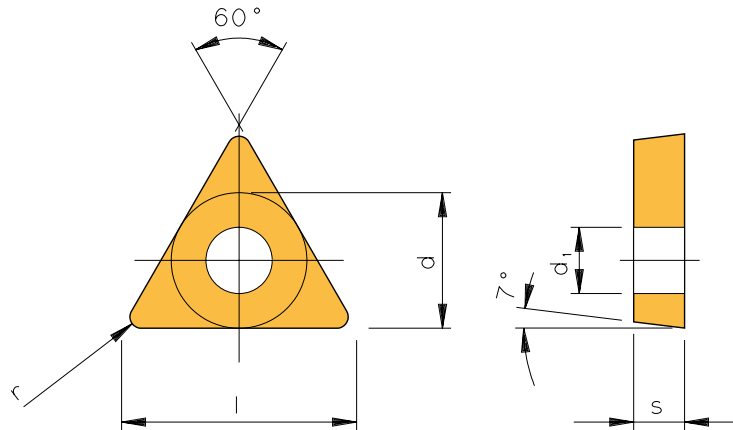
|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ |
| M | ○ |   |   |   | ● | ○ | ● | ● | ● |
| K |   |   |   |   | ○ | ○ |   |   | ○ |
| N |   |   |   |   |   |   |   |   | ○ |
| S | ○ |   |   |   |   |   | ○ | ● | ● |
| H |   |   |   |   |   |   |   |   | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TCMX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC    | HC    |
|------------------------------------|-----|----------------|----------------|-------|-------|
|                                    |     |                |                | AR27C | AM35C |
| TCMX 160404EN                      | 0,4 | 0,08 - 0,2     | 0,6 - 3        | ◆     | ◆     |
| TCMX 160408EN                      | 0,8 | 0,12 - 0,3     | 1,0 - 4        | ◆     | ◆     |
| TCMX 160412EN                      | 1,2 | 0,12 - 0,3     | 1,0 - 4        | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ○ | ● |
| M | ○ | ○ |
| K | ● |   |
| N |   |   |
| S |   |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

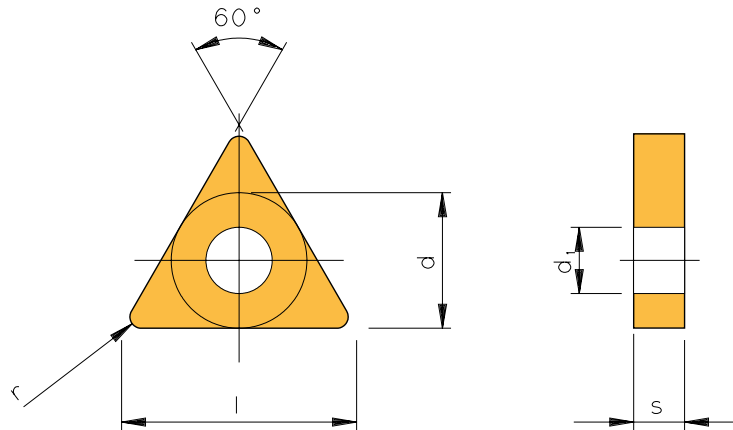
○ Secondary application  
Applicazione secondaria  
Application secondaire



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TNMG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        | HU     |        |        |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 | AM2130 | AM5110 | AM5120 | AM5130 | AS1010 | AS1020 |
| TNMG 160404EN-NFT                  | 0,4 | 0,08 - 0,17    | 0,4 - 1,5      |        |        |        | ◆      | ◆      | ◆      |        | ◆      | ◆      |
| TNMG 160408EN-NFT                  | 0,8 | 0,10 - 0,20    | 0,5 - 2,0      |        |        |        | ◆      | ◆      | ◆      |        | ◆      | ◆      |
| TNMG 160404EN-NM2                  | 0,4 | 0,10 - 0,18    | 0,5 - 2,0      | ◆      |        | ◆      |        |        |        |        |        |        |
| TNMG 160408EN-NM2                  | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      | ◆      |        | ◆      | ◆      |        |        |        |        |        |
| TNMG 160408EN-NMG1                 | 0,8 | 0,20 - 0,40    | 0,8 - 5,0      |        | ◆      | ◆      | ◆      |        |        |        |        |        |
| TNMG 160412EN-NMG1                 | 1,2 | 0,25 - 0,55    | 1,0 - 5,0      |        |        | ◆      |        |        |        |        |        |        |
| TNMG 160404EN-NMR                  | 0,4 | 0,08 - 0,20    | 0,6 - 3,0      |        |        |        | ◆      |        | ◆      |        |        |        |
| TNMG 160408EN-NMR                  | 0,8 | 0,12 - 0,30    | 1,0 - 4,0      |        |        |        | ◆      |        | ◆      |        |        |        |
| TNMG 160408EN-NS1                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      | ◆      |        |        |        |        |        |        |        |        |
| TNMG 160404EN-NMT                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        | ◆      | ◆      | ◆      | ◆      |        |        |
| TNMG 160408EN-NMT                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        | ◆      | ◆      | ◆      | ◆      |        |        |

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        | HC     |        |        | HU     |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 | AM2130 | AM5110 | AM5120 | AM5130 | AS1010 |
| TNMG 160408EN-NMT1                 | 0,8 | 0,12 - 0,30    | 1,0 - 4,0      |        |        |        | ◆      | ◆      | ◆      | ◆      | ◆      |
| TNMG 160412EN-NMT1                 | 1,2 | 0,15 - 0,30    | 1,0 - 4,0      |        |        |        | ◆      | ◆      |        | ◆      | ◆      |
|                                    |     |                |                |        |        |        |        |        |        |        |        |
|                                    |     |                |                |        |        |        |        |        |        |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● |   | ○ | ○ | ○ |   |   |
| M |   |   |   | ● | ● | ● | ○ | ○ | ○ |
| K |   |   |   |   | ○ | ○ | ○ |   |   |
| N |   |   |   |   | ○ | ○ | ● |   |   |
| S |   |   |   |   | ● | ● | ● | ● | ● |
| H |   |   |   |   | ○ | ○ | ○ |   |   |

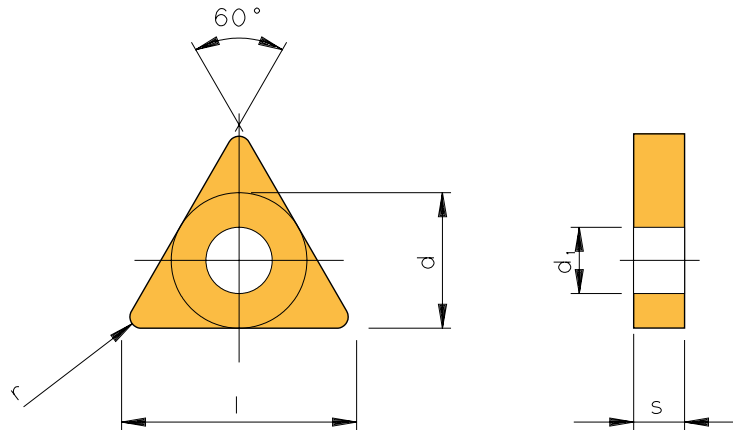
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TNGA



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AH4205 |
|------------------------------------|-----|----------------|----------------|--------------|
| TNGA 160402EN                      | 0,2 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| TNGA 160404EN                      | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆            |
| TNGA 160408EN                      | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

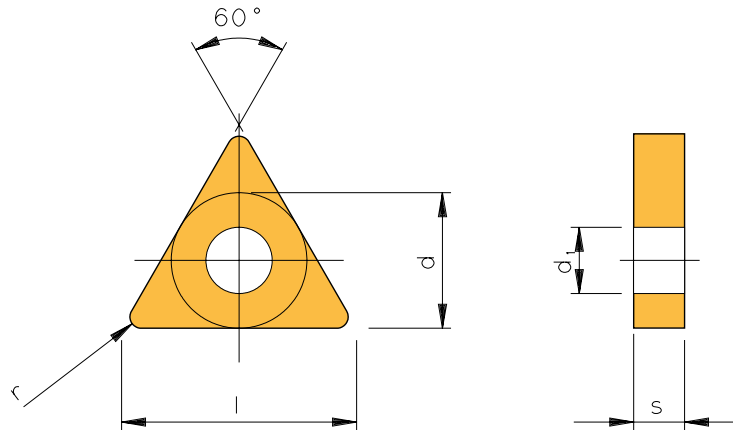
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TNGG



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |
|------------------------------------|-----|----------------|----------------|--------|
|                                    |     |                |                | AH4205 |
| TNGG 160402EN-NFS                  | 0,2 | 0,02 - 0,05    | 0,08 - 3       | ◆      |
| TNGG 160404EN-NFS                  | 0,4 | 0,02 - 0,05    | 0,08 - 3       | ◆      |
| TNGG 160408EN-NFS                  | 0,8 | 0,02 - 0,05    | 0,08 - 3       | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

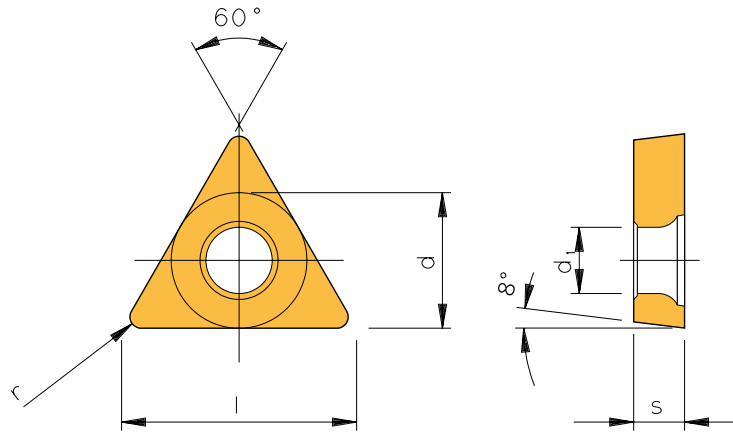
4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TOGT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM5015 | HU<br>AK20 |
|------------------------------------|-----|----------------|----------------|--------------|------------|
| TOGT 06T102EN-ASF                  | 0,2 | 0,05 - 0,12    | 0,2 - 2        | ◆            | ◆          |
| TOGT 090202EN-ASF                  | 0,2 | 0,05 - 0,12    | 0,2 - 2        | ◆            | ◆          |
|                                    |     |                |                |              |            |
|                                    |     |                |                |              |            |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● |   |
| K | ○ | ○ |
| N | ○ | ● |
| S | ● | ○ |
| H | ○ |   |

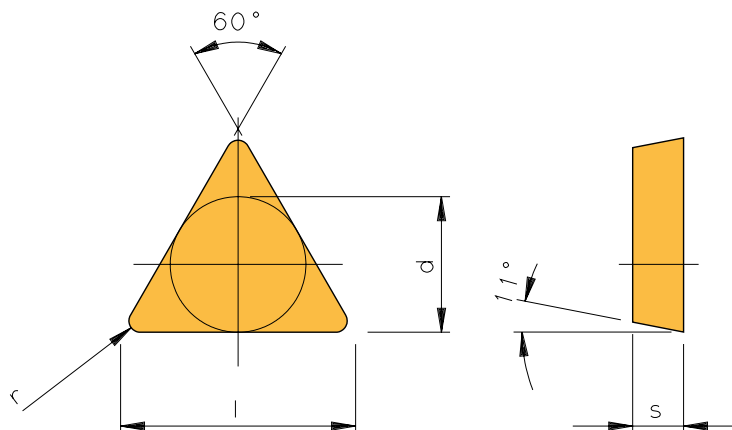
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TPMR



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC    |
|------------------------------------|-----|----------------|----------------|-------|
|                                    |     |                |                | AM35C |
| TPMR 110304EL                      | 0,4 | 0,08 - 0,2     | 0,6 - 3        | ◆     |
| TPMR 110304EN                      | 0,4 | 0,08 - 0,2     | 0,6 - 3        | ◆     |
| TPMR 160304E L/R                   | 0,4 | 0,08 - 0,2     | 0,6 - 3        | ◆     |
| TPMR 160304EN                      | 0,4 | 0,08 - 0,2     | 0,6 - 3        | ◆     |
| TPMR 160308EL                      | 0,8 | 0,12 - 0,3     | 1,0 - 4        | ◆     |
| TPMR 160308EN                      | 0,8 | 0,12 - 0,3     | 1,0 - 4        | ◆     |



HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ○ |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

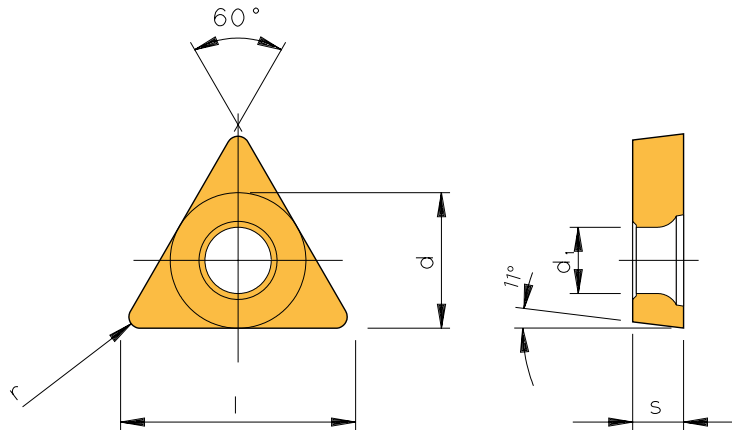
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TPMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | CC<br>AP6510 |
|------------------------------------|-----|----------------|----------------|--------------|
| TPMT 090202EN-AQ                   | 0,2 | 0,08 - 0,2     | 0,2 - 1,5      | ◆            |
|                                    |     |                |                |              |
|                                    |     |                |                |              |
|                                    |     |                |                |              |

CC = Cermet coated / Cermet rivestito / Cermet avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S |   |
| H |   |

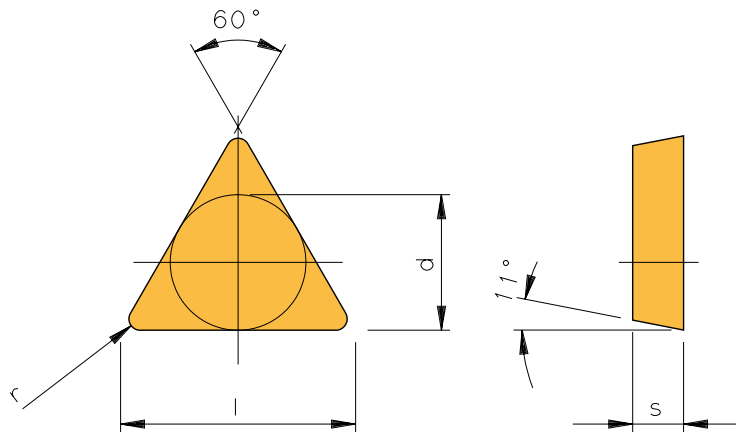
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## TPUN



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | Material   |
|------------------------------------|-----|----------------|----------------|------------|
| TPUN 160308EN                      | 0,8 | 0,02 - 0,05    | 0,08 - 3       | HU<br>AK10 |
|                                    |     |                |                | ◆          |
|                                    |     |                |                |            |
|                                    |     |                |                |            |

4

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K | ○ |
| N | ● |
| S | ○ |
| H |   |

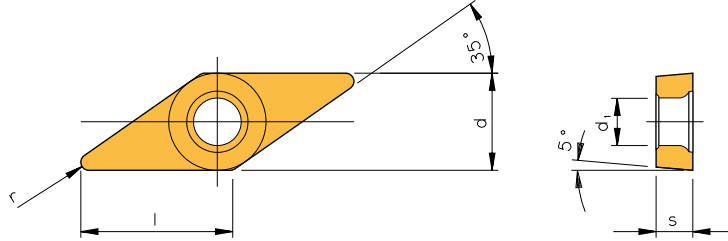
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VBMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | CC<br>AP6510 | CU<br>ACE6 |
|------------------------------------|-----|----------------|----------------|--------------|------------|
| VBMT 110304EN-AQ                   | 0,4 | 0,08 - 0,2     | 0,4 - 1,5      |              | ◆          |
| VBMT 160404EN-AQ                   | 0,4 | 0,08 - 0,2     | 0,4 - 2,0      | ◆            |            |
|                                    |     |                |                |              |            |
|                                    |     |                |                |              |            |

CC = Cermet coated / Cermet rivestito / Cermet avec revêtement  
CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |
|---|---|---|
| P | ● | ● |
| M | ● | ● |
| K | ○ | ○ |
| N |   |   |
| S |   |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

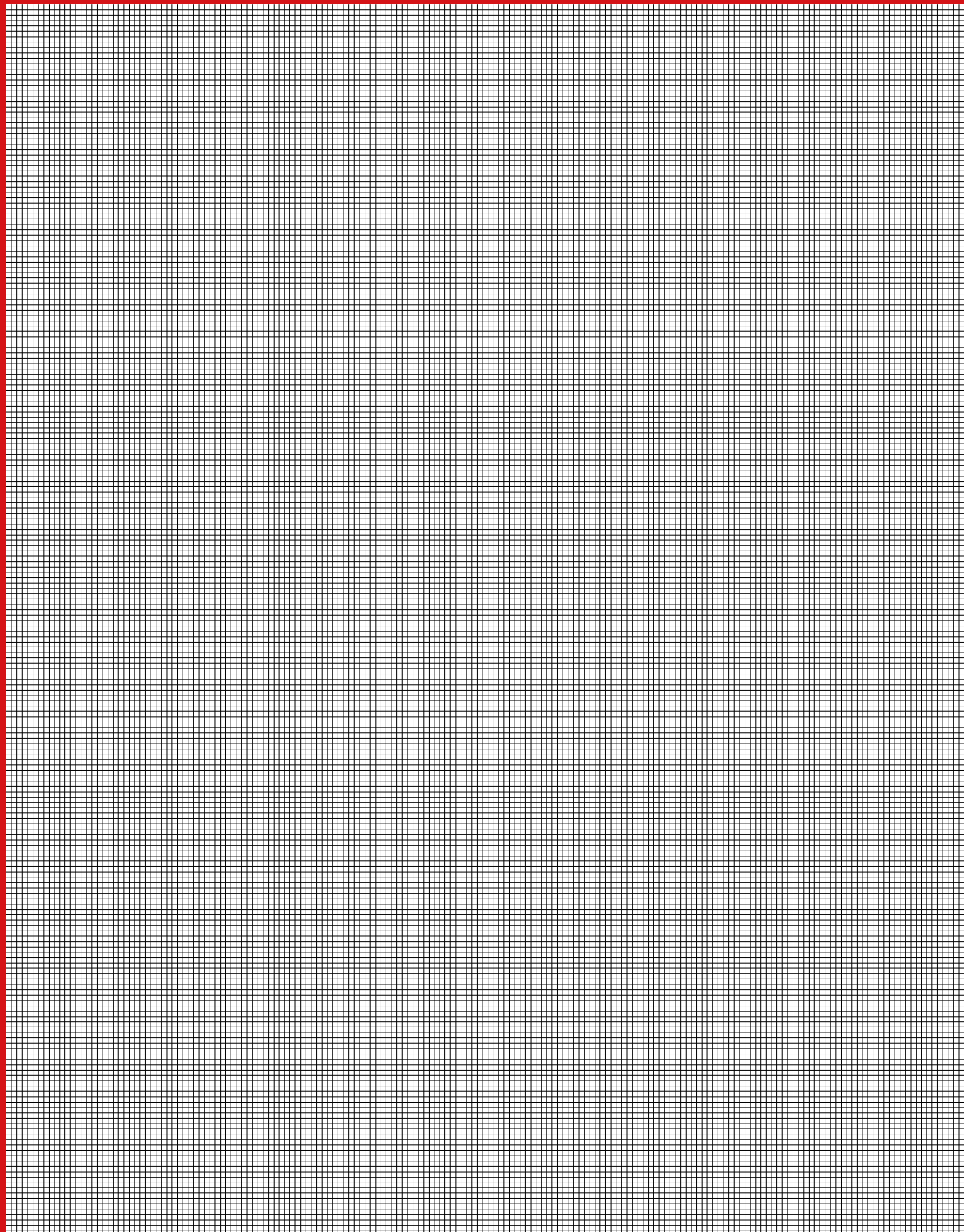
**For more information see**

*Per maggiori informazioni visita il sito*

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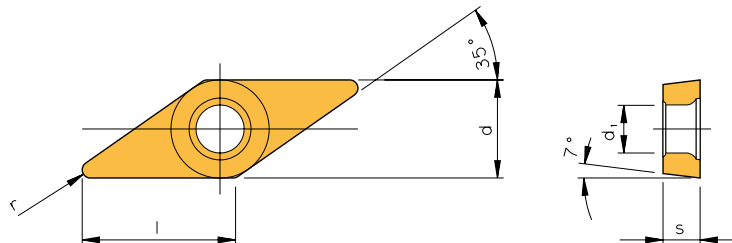
[www.arno.de](http://www.arno.de)



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VCGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CU   | HC     |       |        |        |        |        |        |
|------------------------------------|------|----------------|----------------|------|------|--------|------|--------|-------|--------|--------|--------|--------|--------|
|                                    |      |                |                | AL10 | AL20 | AP5210 | ACE6 | AP6010 | AM15C | AM5015 | AM5020 | AM5025 | AM5110 | AM5120 |
| VCGT 070202EN                      | 0,20 | 0,050 - 0,15   | 0,40 - 1,0     |      |      |        |      |        | ◆     |        |        |        |        |        |
| VCGT 070204EN                      | 0,40 | 0,050 - 0,15   | 0,40 - 1,0     |      |      |        |      |        | ◆     |        |        |        |        |        |
|                                    |      |                |                |      |      |        |      |        |       |        |        |        |        |        |
|                                    |      |                |                |      |      |        |      |        |       |        |        |        |        |        |
| VCGT 110304FN-ACB                  | 0,40 | 0,080 - 0,25   | 0,60 - 2,5     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |
| VCGT 110308FN-ACB                  | 0,80 | 0,100 - 0,35   | 0,80 - 3,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |
| VCGT 130304FN-ACB                  | 0,40 | 0,080 - 0,25   | 0,60 - 3,0     | ◆    |      |        |      |        |       |        |        |        |        |        |
| VCGT 130308FN-ACB                  | 0,80 | 0,080 - 0,25   | 0,60 - 3,0     |      | ◆    |        |      |        |       |        |        |        |        |        |
| VCGT 160404FN-ACB                  | 0,40 | 0,080 - 0,25   | 0,60 - 3,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |
| VCGT 160408FN-ACB                  | 0,80 | 0,100 - 0,35   | 0,80 - 3,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |
| VCGT 160412FN-ACB                  | 1,20 | 0,100 - 0,45   | 1,00 - 3,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |
| VCGT 220520FN-ACB                  | 2,00 | 0,100 - 0,45   | 1,00 - 3,5     |      |      |        |      |        |       |        |        |        |        |        |
| VCGT 220530FN-ACB                  | 3,00 | 0,100 - 0,45   | 1,00 - 3,5     |      | ◆    |        |      |        |       |        |        |        |        |        |

| HC     | HC  |      |      |      |      | HU   |      |        |        |
|--------|-----|------|------|------|------|------|------|--------|--------|
| AM5220 | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 | AK1010 | AK1020 |
|        |     |      |      |      |      |      | ◆    |        |        |
|        |     |      |      |      |      |      |      |        |        |
|        |     |      |      |      |      |      |      |        |        |
|        |     |      |      |      |      |      |      |        |        |
|        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |        |        |
|        |     | ◆    | ◆    | ◆    |      | ◆    | ◆    |        |        |
|        |     | ◆    | ◆    | ◆    |      | ◆    | ◆    |        |        |
|        | ◆   | ◆    | ◆    | ◆    |      | ◆    | ◆    |        |        |
|        | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    |        |        |
|        | ◆   | ◆    | ◆    | ◆    |      | ◆    | ◆    |        |        |
|        | ◆   |      | ◆    |      | ◆    | ◆    | ◆    |        |        |
|        | ◆   |      | ◆    |      | ◆    | ◆    | ◆    |        |        |



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CU   |        | HC    |        |        |        |        |        |   |   |
|------------------------------------|------|----------------|----------------|------|------|--------|------|--------|-------|--------|--------|--------|--------|--------|---|---|
|                                    |      |                |                | AL10 | AL20 | AP5210 | ACE6 | AP6010 | AM15C | AM5015 | AM5020 | AM5025 | AM5110 | AM5120 |   |   |
| VCGT 0702005FN-ALU                 | 0,05 | 0,020 - 0,06   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 070201FN-ALU                  | 0,10 | 0,020 - 0,06   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 070202FN-ALU                  | 0,20 | 0,050 - 0,08   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 070204FN-ALU                  | 0,40 | 0,080 - 0,12   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 110301FN-ALU                  | 0,10 | 0,020 - 0,06   | 0,50 - 1,5     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 110302FN-ALU                  | 0,20 | 0,050 - 0,12   | 0,50 - 2,0     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 110304FN-ALU                  | 0,40 | 0,080 - 0,25   | 0,60 - 2,5     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 110308FN-ALU                  | 0,80 | 0,100 - 0,35   | 0,80 - 3,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 130301FN-ALU                  | 0,10 | 0,020 - 0,06   | 0,50 - 1,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 130302FN-ALU                  | 0,20 | 0,050 - 0,12   | 0,50 - 2,0     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 130304FN-ALU                  | 0,40 | 0,080 - 0,25   | 0,60 - 3,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 130308FN-ALU                  | 0,80 | 0,080 - 0,25   | 0,60 - 3,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160401FN-ALU                  | 0,10 | 0,020 - 0,06   | 0,50 - 1,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160402FN-ALU                  | 0,20 | 0,050 - 0,12   | 0,50 - 2,0     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 160404FN-ALU                  | 0,40 | 0,080 - 0,25   | 0,60 - 3,5     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 160408FN-ALU                  | 0,80 | 0,100 - 0,35   | 0,80 - 3,5     | ◆    | ◆    | ◆      |      |        |       |        |        |        |        |        |   |   |
| VCGT 160412FN-ALU                  | 1,20 | 0,100 - 0,45   | 1,00 - 3,5     |      |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 220520FN-ALU                  | 2,00 | 0,100 - 0,45   | 1,00 - 3,5     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 220530FN-ALU                  | 3,00 | 0,100 - 0,45   | 1,00 - 3,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 1103005FN-ALU                 | 0,05 | 0,020 - 0,06   | 0,50 - 1,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 1303005FN-ALU                 | 0,05 | 0,020 - 0,06   | 0,50 - 1,5     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 0702005FN-ASF                 | 0,05 | 0,020 - 0,06   | 0,10 - 1,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 070201FN-ASF                  | 0,10 | 0,020 - 0,06   | 0,10 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 0702015EN-ASF                 | 0,15 | 0,020 - 0,06   | 0,10 - 1,0     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 070202EN-ASF                  | 0,20 | 0,050 - 0,08   | 0,20 - 1,0     |      |      |        |      |        |       |        |        |        | ◆      |        |   |   |
| VCGT 070202FN-ASF                  | 0,20 | 0,050 - 0,08   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 070204EN-ASF                  | 0,40 | 0,080 - 1,20   | 0,20 - 1,0     |      |      |        |      |        |       |        |        |        |        | ◆      |   |   |
| VCGT 070204FN-ASF                  | 0,40 | 0,080 - 1,20   | 0,20 - 1,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 110301EN-ASF                  | 0,10 | 0,020 - 0,06   | 0,10 - 1,5     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 110301FN-ASF                  | 0,10 | 0,020 - 0,06   | 0,10 - 1,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   | ◆ |
| VCGT 110302EN-ASF                  | 0,20 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       | ◆      | ◆      | ◆      |        |        |   |   |
| VCGT 110302FN-ASF                  | -    | 0,050 - 0,12   | 0,20 - 2,0     | ◆    | ◆    |        |      |        |       |        |        |        |        | ◆      | ◆ |   |
| VCGT 110304EN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     |      |      |        |      |        |       | ◆      | ◆      | ◆      |        |        |   |   |
| VCGT 110304FN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     | ◆    | ◆    |        |      |        |       |        |        |        |        | ◆      | ◆ |   |
| VCGT 130301FN-ASF                  | 0,10 | 0,050 - 0,12   | 0,20 - 2,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 130302EN-ASF                  | 0,20 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 130302FN-ASF                  | 0,20 | 0,050 - 0,12   | 0,20 - 2,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 130304EN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 130304FN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160401FN-ASF                  | 0,10 | 0,050 - 0,12   | 0,20 - 2,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160402EN-ASF                  | 0,20 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       | ◆      |        |        | ◆      |        |   |   |
| VCGT 160402FN-ASF                  | 0,20 | 0,050 - 0,12   | 0,20 - 2,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160404EN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     |      |      |        |      |        |       | ◆      |        |        | ◆      |        |   |   |
| VCGT 160404FN-ASF                  | 0,40 | 0,080 - 0,25   | 0,20 - 2,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160408EN-ASF                  | 0,80 | 0,100 - 0,30   | 0,30 - 3,0     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 160408FN-ASF                  | 0,80 | 0,100 - 0,30   | 0,30 - 3,0     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 1103005FN-ASF                 | 0,05 | 0,020 - 0,06   | 0,10 - 1,5     | ◆    | ◆    |        |      |        |       |        |        |        |        |        |   | ◆ |
| VCGT 1103008FN-ASF                 | 0,08 | 0,020 - 0,06   | 0,10 - 1,5     |      |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 1103015EN-ASF                 | 0,15 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       | ◆      |        | ◆      |        |        |   |   |
| VCGT 1103015FN-ASF                 | 0,15 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       |        |        | ◆      |        |        |   |   |
| VCGT 1103035EN-ASF                 | 0,35 | 0,080 - 0,25   | 0,20 - 2,5     |      |      |        |      |        |       | ◆      |        |        |        |        |   |   |
| VCGT 1303005FN-ASF                 | 0,05 | 0,050 - 0,12   | 0,20 - 2,0     |      |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 110302FN-AWI                  | 0,20 | 0,100 - 0,30   | 0,30 - 3,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 110304FN-AWI                  | 0,40 | 0,120 - 0,40   | 0,50 - 4,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 110308FN-AWI                  | 0,80 | 0,150 - 0,50   | 0,70 - 4,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160404FN-AWI                  | 0,40 | 0,120 - 0,40   | 0,50 - 4,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |
| VCGT 160408FN-AWI                  | 0,80 | 0,150 - 0,50   | 0,70 - 4,0     | ◆    |      |        |      |        |       |        |        |        |        |        |   |   |










4



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

| Designation<br>Articolo<br>Article   | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      |        | CU   |        | HC    |        |        |        |        |        |  |  |   |
|--|------|----------------|----------------|------|------|--------|------|--------|-------|--------|--------|--------|--------|--------|--|--|---|
|  |      |                |                | AL10 | AL20 | AP5210 | ACE6 | AP6010 | AM15C | AM5015 | AM5020 | AM5025 | AM5110 | AM5120 |  |  |   |
|  VCGT 110301FN-AZ   | 0,10 | 0,100 - 0,30   | 1,50 - 3,5     |      |      |        | ◆    |        |       |        |        |        |        |        |  |  |   |
| VCGT 110302FN-AZ   | 0,20 | 0,100 - 0,30   | 1,50 - 3,5     |      |      |        | ◆    |        |       |        |        |        |        |        |  |  |   |
| VCGT 110304FN-AZ   | 0,40 | 0,100 - 0,30   | 1,50 - 3,5     |      |      |        | ◆    |        |       |        |        |        |        |        |  |  |   |
|  VCGT 110301FL-PF2  | 0,10 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       |        |        |        |        |        |  |  |   |
| VCGT 110301FR-PF2  | 0,10 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 110302FL-PF2  | 0,20 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 110302FR-PF2  | 0,20 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 1103003FL-PF2   | 0,03 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 1103003FR-PF2   | 0,03 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 1103008FL-PF2   | 0,08 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
| VCGT 1103008FR-PF2   | 0,08 | 0,015 - 0,12   | 0,02 - 2,0     |      |      |        |      |        |       | ◆      |        |        |        |        |  |  |   |
|  VCGT 050101EN-PS2  | 0,10 | 0,040 - 0,15   | 0,05 - 1,0     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  | ◆ |
| VCGT 050102EN-PS2  | 0,20 | 0,040 - 0,20   | 0,10 - 2,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  | ◆ |
| VCGT 050104EN-PS2  | 0,40 | 0,050 - 0,16   | 0,10 - 1,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  | ◆ |
|  VCGT 110301FN-PS | 0,10 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      | ◆      |       |        | ◆      |        |        |        |  |  |   |
| VCGT 110302FN-PS   | 0,20 | 0,040 - 0,10   | 0,20 - 1,5     |      |      |        |      | ◆      |       |        | ◆      |        |        |        |  |  |   |
| VCGT 110304FN-PS   | 0,40 | 0,060 - 0,18   | 0,30 - 2,0     |      |      |        |      | ◆      |       |        | ◆      |        |        |        |  |  |   |
| VCGT 160401FN-PS   | 0,10 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      |        |       |        | ◆      |        |        |        |  |  |   |
| VCGT 160402FN-PS   | 0,20 | 0,040 - 0,10   | 0,20 - 1,5     |      |      |        |      |        |       |        | ◆      |        |        |        |  |  |   |
| VCGT 160404FN-PS   | 0,40 | 0,080 - 0,20   | 0,30 - 2,0     |      |      |        |      |        |       |        | ◆      |        |        |        |  |  |   |
| VCGT 1103005FN-PS  | 0,05 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      | ◆      |       |        | ◆      |        |        |        |  |  |   |
| VCGT 1103008FN-PS  | 0,08 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      |        |       |        | ◆      |        |        |        |  |  |   |
| VCGT 1103015FN-PS  | 0,15 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      |        |       |        | ◆      |        |        |        |  |  |   |
| VCGT 1604005FN-PS  | 0,05 | 0,040 - 0,10   | 0,10 - 1,0     |      |      |        |      |        |       |        |        | ◆      |        |        |  |  |   |
|  VCGT 110301FL-U  | 0,10 | 0,040 - 0,15   | 0,05 - 1,0     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
| VCGT 110301FR-U  | 0,10 | 0,040 - 0,15   | 0,05 - 1,0     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
| VCGT 110302FL-U  | 0,20 | 0,040 - 0,20   | 0,10 - 2,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
| VCGT 110302FR-U  | 0,20 | 0,040 - 0,20   | 0,10 - 2,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
|  VCGT 160404FL-Y  | 0,40 | 0,050 - 0,16   | 0,10 - 1,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
| VCGT 160404FR-Y  | 0,40 | 0,050 - 0,16   | 0,10 - 1,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |
|  VCGT 070202FR    | 0,20 | 0,040 - 0,20   | 0,10 - 2,5     |      |      |        |      | ◆      |       |        |        |        |        |        |  |  |   |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

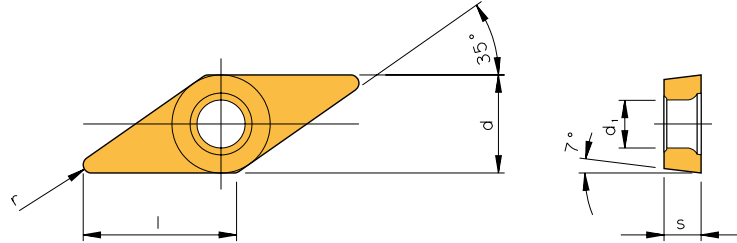
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| M | ○ | ○ | ● | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| K | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |   | ○ |   |   |   |   |   |   | ○ |   | ○ |   |
| S | ○ | ○ | ● |   |   |   | ● |   | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| H |   |   |   |   |   |   |   |   | ○ |   |   |   |   | ○ |   | ○ |   |



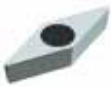
# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VCGW



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HU   |
|------------------------------------|-----|----------------|----------------|------|
| VCGW 070201EN                      | 0,1 | 0,02 - 0,05    | 0,04 - 1,0     | AK20 |
| VCGW 070202EN                      | 0,2 | 0,02 - 0,05    | 0,04 - 1,0     | ◆    |
|                                    |     |                |                |      |
|                                    |     |                |                |      |

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K | ○ |
| N | ● |
| S | ○ |
| H |   |

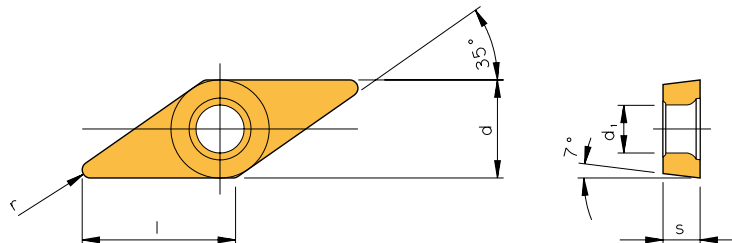
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VCGX



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | HU   |
|------------------------------------|-----|----------------|----------------|--------|------|
|                                    |     |                |                | AM5025 | AK20 |
| VCGX 110301F L/R                   | 0,1 | 0,04 - 0,15    | 0,05 - 1,0     | ◆      | ◆    |
| VCGX 110302F L/R                   | 0,2 | 0,04 - 0,20    | 0,10 - 2,5     | ◆      | ◆    |
| VCGX 110304F L/R                   | 0,4 | 0,06 - 0,20    | 0,15 - 2,5     | ◆      | ◆    |
| VCGX 130301FR                      | 0,1 | 0,04 - 0,15    | 0,05 - 1,5     | ◆      | ◆    |
| VCGX 130302F L/R                   | 0,2 | 0,04 - 0,15    | 0,05 - 1,5     | ◆      | ◆    |
| VCGX 130304F L/R                   | 0,4 | 0,04 - 0,20    | 0,10 - 3,0     | ◆      | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

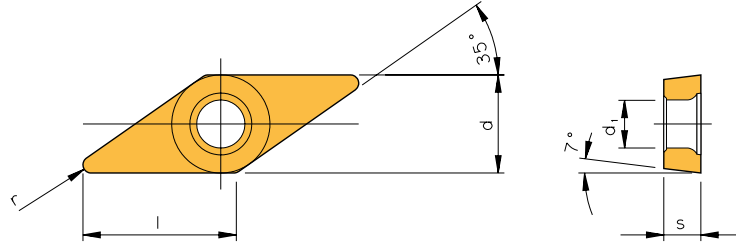
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |        |        | CU   |        | HC     |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2025 | AP2035 | AP2310 | AP2320 | AP2335 | ACE6 | AP6010 | AM2035 | AM2130 | AM5110 | AM5120 |
| VCMT 110302EN-AM                   | 0,2 | 0,05 - 0,15    | 0,4 - 1,5      |        |        |        | ◆      | ◆      |      |        |        | ◆      |        | ◆      |
| VCMT 110304EN-AM                   | 0,4 | 0,08 - 0,20    | 0,4 - 1,5      |        |        |        | ◆      | ◆      |      |        |        | ◆      |        | ◆      |
| VCMT 110308EN-AM                   | 0,8 | 0,12 - 0,25    | 0,5 - 1,5      | ◆      | ◆      |        |        |        |      |        |        |        |        |        |
| VCMT 160404EN-AM                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        | ◆      | ◆      | ◆      |      |        |        | ◆      |        | ◆      |
| VCMT 160408EN-AM                   | 0,8 | 0,12 - 0,30    | 0,5 - 2,0      |        |        |        | ◆      | ◆      |      |        |        | ◆      |        | ◆      |
| VCMT 160412EN-AM                   | 1,2 | 0,12 - 0,32    | 0,5 - 2,0      | ◆      |        |        |        |        |      |        |        | ◆      |        |        |
| VCMT 110304EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,4 - 1,5      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 160404EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 070202EN-PM1                  | 0,2 | 0,05 - 0,15    | 0,4 - 1,0      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 070204EN-PM1                  | 0,4 | 0,05 - 0,15    | 0,4 - 1,0      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 110302EN-PM1                  | 0,2 | 0,05 - 0,15    | 0,4 - 1,5      |        |        |        |        |        | ◆    |        |        | ◆      | ◆      | ◆      |
| VCMT 110304EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,4 - 1,5      |        |        | ◆      | ◆      |        | ◆    |        |        | ◆      | ◆      | ◆      |
| VCMT 160404EN-PM1                  | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        | ◆      | ◆      |        | ◆    |        |        | ◆      | ◆      | ◆      |
| VCMT 160408EN-PM1                  | 0,8 | 0,12 - 0,30    | 0,5 - 2,0      |        |        |        | ◆      |        | ◆    |        |        | ◆      | ◆      | ◆      |
| VCMT 070202EN-PS2                  | 0,2 | 0,04 - 0,20    | 0,1 - 2,5      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 070204EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      |        |        |        |        |        | ◆    |        |        |        |        |        |
| VCMT 110302EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,1 - 1,0      |        |        | ◆      | ◆      |        |      |        |        |        | ◆      | ◆      |
| VCMT 110304EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      |        |        | ◆      | ◆      |        |      |        |        | ◆      | ◆      | ◆      |
| VCMT 160404EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      |        |        | ◆      | ◆      |        |      |        |        | ◆      | ◆      | ◆      |
| VCMT 110302EN-PMT1                 | 0,2 | 0,08 - 0,20    | 0,4 - 2,0      |        |        |        |        |        |      |        |        | ◆      | ◆      | ◆      |
| VCMT 110304EN-PMT1                 | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        |        |        |        |        |      |        |        | ◆      | ◆      | ◆      |
| VCMT 160404EN-PMT1                 | 0,4 | 0,12 - 0,25    | 0,8 - 3,0      |        |        |        |        |        |      |        |        | ◆      | ◆      | ◆      |
| VCMT 160408EN-PMT1                 | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      |        |        |        |        |        |      |        |        | ◆      | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| M | ○ | ○ |   |   |   | ● | ○ | ● | ● | ● |
| K | ● |   |   |   |   | ○ | ○ |   | ○ | ○ |
| N |   |   |   |   |   |   |   |   | ○ | ○ |
| S | ○ | ○ |   |   |   |   |   | ● | ● | ● |
| H |   |   |   |   |   |   |   |   | ○ | ○ |

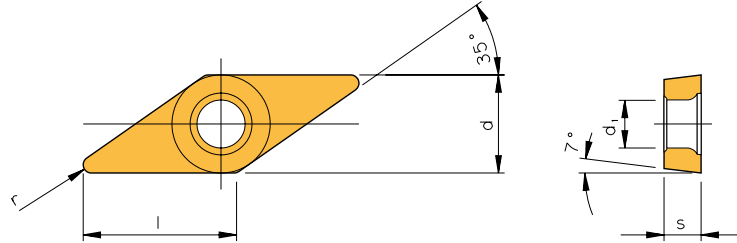




# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VCXT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM5020 | HU<br>AK10 |
|------------------------------------|-----|----------------|----------------|--------------|------------|
| VCXT 110302EN-AEC                  | 0,2 | 0,05 - 0,12    | 0,5 - 2,0      | ◆            |            |
| VCXT 160404EN-AEC                  | 0,4 | 0,08 - 0,25    | 0,6 - 3,5      | ◆            |            |
| VCXT 160408EN-AEC                  | 0,8 | 0,10 - 0,35    | 0,8 - 3,5      | ◆            |            |
| VCXT 160408FN-AEC                  | 0,8 | 0,10 - 0,35    | 0,8 - 3,5      |              | ◆          |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

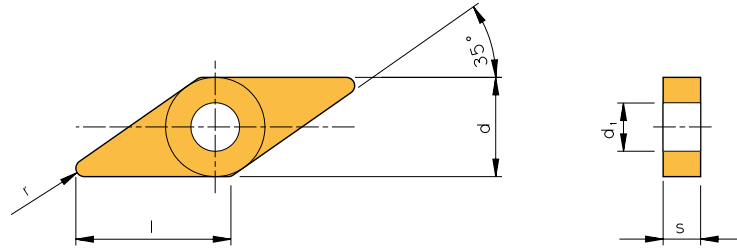
|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K |   | ○ |
| N |   | ● |
| S |   | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VNGP



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM5025 | HU<br>AK1020 |
|------------------------------------|-----|----------------|----------------|--------------|--------------|
| VNGP 160402FN-EX                   | 0,2 | 0,05 - 0,25    | 0,03 - 3,0     | ◆            |              |
| VNGP 160404FN-EX                   | 0,4 | 0,05 - 0,25    | 0,05 - 3,5     | ◆            | ◆            |
|                                    |     |                |                |              |              |
|                                    |     |                |                |              |              |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

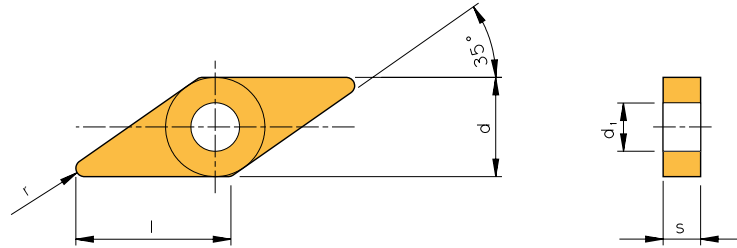
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VNMG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     | CC     | HC     |        |        | HU     |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP6510 | AM2130 | AM5110 | AM5120 | AS1010 | AS1020 |
| VNMG 160404EN-AQ                   | 0,4 | 0,08 - 0,20    | 0,4 - 2,0      |        | ◆      |        |        |        |        |        |
| VNMG 160408EN-AQ                   | 0,8 | 0,12 - 0,30    | 0,5 - 2,0      |        | ◆      |        |        |        |        |        |
| VNMG 160404EN-NFT                  | 0,4 | 0,05 - 0,15    | 0,2 - 1,5      |        |        | ◆      | ◆      | ◆      | ◆      | ◆      |
| VNMG 160408EN-NFT                  | 0,8 | 0,07 - 0,18    | 0,3 - 2,0      |        |        | ◆      | ◆      | ◆      | ◆      | ◆      |
| VNMG 160404EN-NM2                  | 0,4 | 0,10 - 0,18    | 0,5 - 2,0      | ◆      |        | ◆      |        |        |        |        |
| VNMG 160408EN-NMR                  | 0,8 | 0,15 - 0,25    | 0,8 - 3,0      |        |        | ◆      |        |        |        |        |
| VNMG 160404EN-NS1                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      | ◆      |        |        |        |        |        |        |

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 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 CC = Cermet coated / Cermet rivestito / Cermet avec revêtement

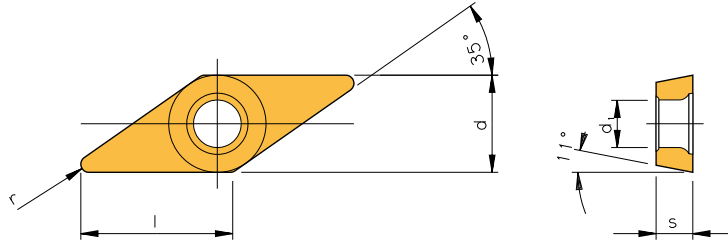
|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| P | ● | ● | ○ | ○ |   |   |
| M |   | ● | ● | ● | ○ | ○ |
| K |   | ○ | ○ | ○ |   |   |
| N |   |   | ○ | ○ |   |   |
| S |   |   | ● | ● | ● | ● |
| H |   |   | ○ | ○ |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## VPGT



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC  |      |      | HU   |      |
|------------------------------------|-----|----------------|----------------|-----|------|------|------|------|
|                                    |     |                |                | AD2 | AT10 | AT20 | AK10 | AK20 |
| VPGT 220512FN-ACB                  | 1,2 | 0,1 - 0,45     | 1,0 - 3,5      |     |      | ◆    |      | ◆    |
| VPGT 220516EN-ACB                  | 1,6 | 0,1 - 0,45     | 1,0 - 3,5      |     |      |      |      | ◆    |
| VPGT 220516FN-ACB                  | 1,6 | 0,1 - 0,45     | 1,0 - 3,5      |     | ◆    |      |      | ◆    |
| VPGT 220512FN-ALU                  | 1,2 | 0,1 - 0,45     | 1,0 - 3,5      |     |      |      | ◆    | ◆    |
| VPGT 220516FN-ALU                  | 1,6 | 0,1 - 0,45     | 1,0 - 3,5      | ◆   |      |      | ◆    | ◆    |
| VPGT 220530FN-ALU                  | 3,0 | 0,1 - 0,45     | 1,0 - 3,5      |     |      |      |      | ◆    |
| VPGT 220512FN-ASF                  | 1,2 | 0,1 - 0,30     | 0,3 - 3,0      |     |      |      | ◆    |      |

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|   |   |   |   |   |
|---|---|---|---|---|
| P | ○ | ○ |   |   |
| M | ○ | ○ |   |   |
| K | ○ | ○ | ○ | ○ |
| N | ● | ● | ● | ● |
| S | ○ | ○ | ○ | ○ |
| H |   |   |   |   |

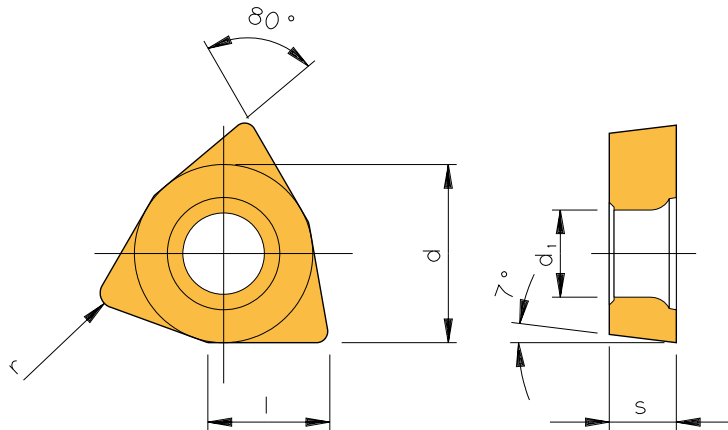
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## WCGT



4



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      | CU   | HC    |       | HC  |      |      |      |      | HU   | HU   |   |
|------------------------------------|------|----------------|----------------|------|------|------|-------|-------|-----|------|------|------|------|------|------|---|
|                                    |      |                |                | AL10 | AL20 | ACE6 | AM15C | AM35C | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 |   |
| WCGT 020102EN                      | 0,20 | 0,05 - 0,12    | 0,20 - 1,0     |      |      | ◆    | ◆     |       |     |      |      |      |      |      |      |   |
| WCGT 020104EN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      | ◆    | ◆     |       |     |      |      |      |      |      |      |   |
| WCGT 030204FN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       |       |     |      |      |      |      |      |      |   |
| WCGT 030204SN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      | ◆ |
| WCGT 050304SN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      |   |
| WCGT 060304FN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      | ◆ |
| WCGT 060304SN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      | ◆ |
| WCGT 07T304FN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      | ◆ |
| WCGT 07T304SN                      | 0,40 | 0,05 - 0,12    | 0,20 - 1,0     |      |      |      |       | ◆     |     |      |      |      |      |      |      |   |
| WCGT 040204FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 2,5     |      |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 080404FN-ACB                  | 0,40 | 0,08 - 0,25    | 0,60 - 4,0     |      | ◆    |      |       |       |     | ◆    |      |      | ◆    |      | ◆    | ◆ |
| WCGT 0201005FN-ALU                 | 0,05 | 0,05 - 0,12    | 0,50 - 1,5     |      | ◆    |      |       |       |     |      |      |      |      |      |      | ◆ |
| WCGT 020101FN-ALU                  | 0,10 | 0,05 - 0,12    | 0,50 - 1,5     |      | ◆    |      |       |       |     |      |      |      |      |      |      | ◆ |
| WCGT 020102FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 1,5     |      | ◆    |      |       |       |     |      | ◆    |      |      |      |      | ◆ |
| WCGT 030202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 1,5     | ◆    |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 030204FN-ALU                  | 0,40 | 0,08 - 0,20    | 0,60 - 1,5     | ◆    | ◆    |      |       |       | ◆   | ◆    |      | ◆    |      |      | ◆    | ◆ |
| WCGT 040201FN-ALU                  | 0,10 | 0,05 - 0,12    | 0,50 - 2,0     |      |      |      |       |       | ◆   | ◆    |      |      |      |      | ◆    | ◆ |
| WCGT 040202FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,50 - 2,0     | ◆    | ◆    |      |       |       | ◆   | ◆    |      | ◆    | ◆    |      | ◆    | ◆ |
| WCGT 040204FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 2,5     | ◆    |      |      |       |       | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    | ◆ |
| WCGT 06T301FN-ALU                  | 0,10 | 0,05 - 0,12    | 0,60 - 2,0     |      |      |      |       |       | ◆   |      | ◆    |      |      |      | ◆    | ◆ |
| WCGT 06T302FN-ALU                  | 0,20 | 0,05 - 0,12    | 0,60 - 2,0     | ◆    | ◆    |      |       |       | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    | ◆ |
| WCGT 06T304FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 3,0     | ◆    | ◆    |      |       |       | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    | ◆ |
| WCGT 080404FN-ALU                  | 0,40 | 0,08 - 0,25    | 0,60 - 4,0     | ◆    | ◆    |      |       |       | ◆   | ◆    | ◆    | ◆    | ◆    | ◆    | ◆    | ◆ |
| WCGT 080408FN-ALU                  | 0,80 | 0,10 - 0,35    | 0,80 - 4,0     | ◆    |      |      |       |       | ◆   |      | ◆    |      |      |      | ◆    |   |
| WCGT 040202FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     | ◆    | ◆    |      |       |       | ◆   | ◆    |      |      |      |      | ◆    | ◆ |
| WCGT 040204FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     | ◆    |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 06T301FN-ASF                  | 0,10 | 0,02 - 0,06    | 0,10 - 1,5     |      |      |      |       |       |     |      |      |      |      |      | ◆    | ◆ |
| WCGT 06T302FN-ASF                  | 0,20 | 0,05 - 0,12    | 0,20 - 2,0     |      |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 06T304FN-ASF                  | 0,40 | 0,08 - 0,25    | 0,20 - 2,5     | ◆    | ◆    |      |       |       | ◆   | ◆    |      |      |      |      | ◆    | ◆ |
| WCGT 040204FN-AWI                  | 0,40 | 0,08 - 0,20    | 0,20 - 1,2     | ◆    |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 040208FN-AWI                  | 0,80 | 0,08 - 0,20    | 0,20 - 1,2     |      |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |
| WCGT 080404FN-AWI                  | 0,40 | 0,12 - 0,40    | 0,50 - 4,0     | ◆    |      |      |       |       | ◆   |      |      |      |      |      | ◆    | ◆ |



| Designation<br>Articolo<br>Article | r    | f <sub>n</sub> | a <sub>p</sub> | HC   |      | CU   | HC    |       | HC  |      |      |      |      | HU   | HU   |
|------------------------------------|------|----------------|----------------|------|------|------|-------|-------|-----|------|------|------|------|------|------|
|                                    |      |                |                | AL10 | AL20 | ACE6 | AM15C | AM35C | AD2 | AT10 | AT20 | PVD1 | PVD2 | AK10 | AK20 |
| WCGT 020101F L/R                   | 0,10 | 0,02 - 0,05    | 0,08 - 1,5     |      |      | ◆    | ◆     |       |     |      |      |      |      |      |      |
| WCGT 020102F L/R                   | 0,20 | 0,02 - 0,05    | 0,08 - 1,5     |      |      | ◆    | ◆     |       |     |      |      |      |      |      |      |
|                                    |      |                |                |      |      |      |       |       |     |      |      |      |      |      |      |
|                                    |      |                |                |      |      |      |       |       |     |      |      |      |      |      |      |

**HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement**  
**HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement**  
**CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement**

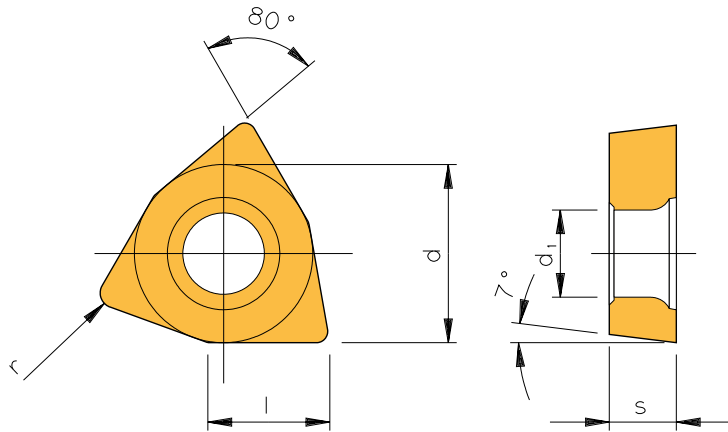
|   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ○ | ● |  | ○ | ○ | ○ | ○ |   |   |   |   |   |
| M | ○ | ○ | ● | ● | ○ |  | ○ | ○ | ○ | ○ |   |   |   |   |   |
| K | ● | ● | ○ | ○ |   |  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |  | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| S | ○ | ○ |   |   |   |  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| H |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |

● **Main application**  
*Applicazione principale*  
 Application principale  
 ○ **Secondary application**  
*Applicazione secondaria*  
 Application secondaire

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## WCMT



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        | CU     | HC    |      | HC     |       |        |        |        |        |        |  |  |  |  |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|-------|------|--------|-------|--------|--------|--------|--------|--------|--|--|--|--|
|                                    |     |                |                | AP2035 | AP2320 | AP2335 | AR27C | ACE6 | AP6010 | AM35C | AM2030 | AM2130 | AM5025 | AM5120 | AM5130 |  |  |  |  |
| WCMT 020104EN                      | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 030204SN                      | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        | ◆      |        |        |        |  |  |  |  |
| WCMT 050304SN                      | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        | ◆      |        |        |        |  |  |  |  |
| WCMT 060304SN                      | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        | ◆      |        |        |        |  |  |  |  |
| WCMT 07T304SN                      | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 020102EN                      | 0,2 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 030202EN-AM                   | 0,2 | 0,05 - 0,12    | 0,3 - 1,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 040204EN-AM                   | 0,4 | 0,08 - 0,25    | 0,4 - 2,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 06T304EN-AM                   | 0,4 | 0,08 - 0,25    | 0,4 - 2,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 06T308EN-AM                   | 0,8 | 0,12 - 0,32    | 0,5 - 2,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 080404EN-AM                   | 0,4 | 0,08 - 0,25    | 0,5 - 3,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 080408EN-AM                   | 0,8 | 0,10 - 0,35    | 0,6 - 3,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 020102EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 020102EN-PM1                  | 0,2 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |
| WCMT 020104EN-PM1                  | 0,4 | 0,08 - 0,25    | 0,3 - 1,5      |        |        |        |       |      |        |       |        |        |        |        |        |  |  |  |  |



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        |       | CU   |        | HC    |        |        |        |        |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|-------|------|--------|-------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2035 | AP2320 | AP2335 | AR27C | ACE6 | AP6010 | AM35C | AM2030 | AM2130 | AM5025 | AM5120 | AM5130 |
| WCMT 020102EN-PS2                  | 0,2 | 0,04 - 0,12    | 0,1 - 1,0      |        |        |        |       | ◆    |        |       |        |        |        |        | ◆      |
| WCMT 020104EN-PS2                  | 0,4 | 0,05 - 0,16    | 0,1 - 1,5      |        |        |        |       | ◆    |        |       |        |        |        |        |        |
|                                    |     |                |                |        |        |        |       |      |        |       |        |        |        |        |        |
|                                    |     |                |                |        |        |        |       |      |        |       |        |        |        |        |        |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 CU = Cermet uncoated / Cermet non rivestito / Cermet sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | ● | ● | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| M | ○ |   |   | ○ | ● | ○ | ○ | ● | ● | ● | ● | ● | ● | ○ | ○ |
| K |   |   |   | ● | ○ | ○ |   |   |   |   | ○ | ○ | ○ | ○ | ○ |
| N |   |   |   |   |   |   |   |   |   |   |   |   | ○ | ● | ○ |
| S | ○ |   |   |   |   |   |   |   | ● |   | ● | ● | ● | ● | ○ |
| H |   |   |   |   |   |   |   |   |   |   |   |   | ○ | ○ | ○ |

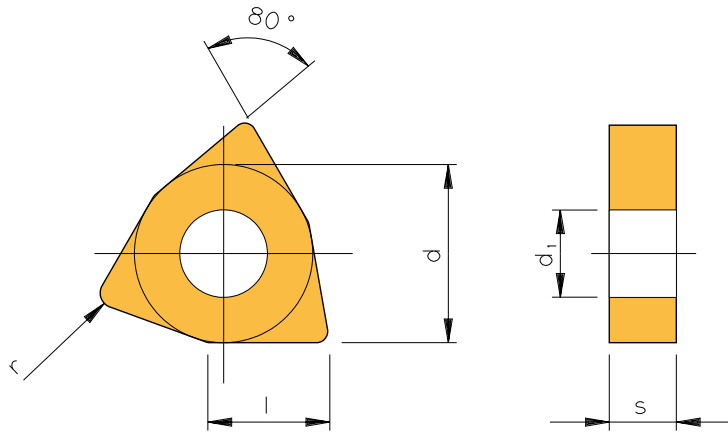
● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## WNGP



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC<br>AM5025 | HU<br>AK1020 |
|------------------------------------|-----|----------------|----------------|--------------|--------------|
| WNGP 080404FN-EX                   | 0,4 | 0,05 - 0,25    | 0,05 - 3,5     | ◆            | ◆            |
| WNGP 080408FN-EX                   | 0,8 | 0,05 - 0,25    | 0,05 - 4,0     | ◆            | ◆            |
|                                    |     |                |                |              |              |
|                                    |     |                |                |              |              |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K | ○ | ○ |
| N |   | ● |
| S | ● | ○ |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

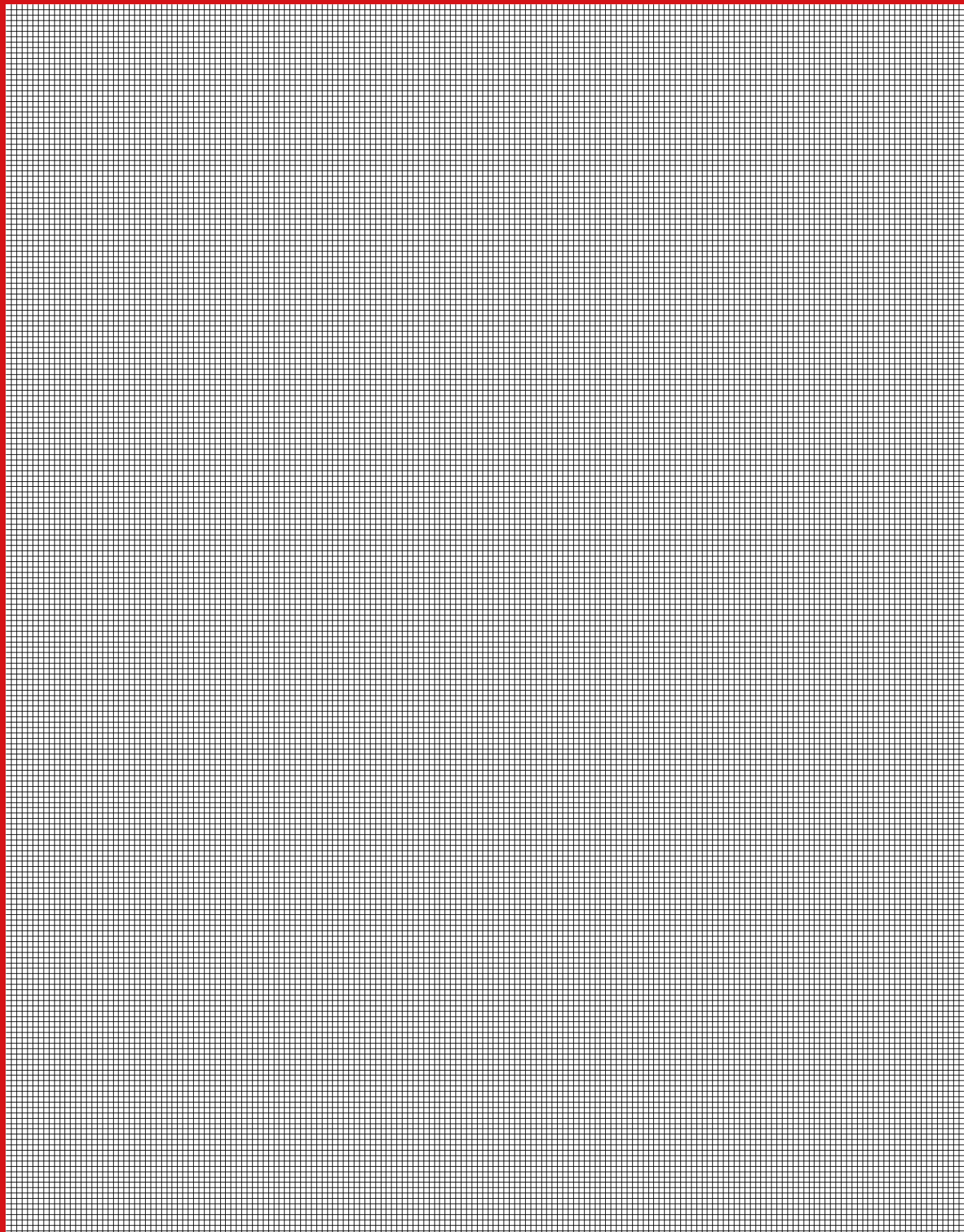
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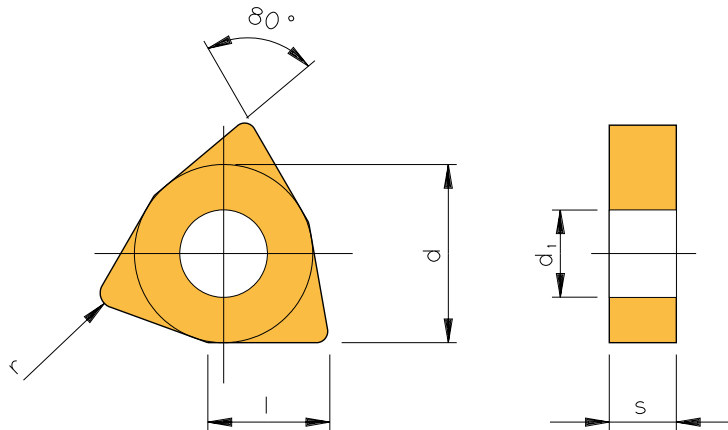
[www.arno.de](http://www.arno.de)



# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO

## WNMG



4



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        | HC     |        |        | HC     | HU     |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 | AM2130 | AM5110 | AM5120 | AM5130 | AK2310 | AS1010 |
| WNMG 080404EN-NFT                  | 0,4 | 0,08 - 0,17    | 0,4 - 1,5      |        |        |        | ◆      | ◆      | ◆      |        | ◆      | ◆      |
| WNMG 080408EN-NFT                  | 0,8 | 0,10 - 0,20    | 0,5 - 2,0      |        |        |        | ◆      | ◆      | ◆      |        | ◆      | ◆      |
| WNMG 060404EN-NM2                  | 0,4 | 0,10 - 0,18    | 0,5 - 2,0      | ◆      |        | ◆      |        |        |        |        |        |        |
| WNMG 060408EN-NM2                  | 0,8 | 0,15 - 0,25    | 0,8 - 2,5      | ◆      |        | ◆      |        |        |        |        |        |        |
| WNMG 080404EN-NM2                  | 0,4 | 0,10 - 0,20    | 0,5 - 3,0      | ◆      |        | ◆      |        |        |        |        |        |        |
| WNMG 080408EN-NM2                  | 0,8 | 0,15 - 0,32    | 0,8 - 3,0      | ◆      |        | ◆      |        |        |        |        |        |        |
| WNMG 080412EN-NM2                  | 1,2 | 0,15 - 0,35    | 0,8 - 3,5      | ◆      |        | ◆      |        |        |        | ◆      |        |        |
| WNMG 080408EN-NMG1                 | 0,8 | 0,20 - 0,40    | 0,8 - 6,0      | ◆      | ◆      | ◆      |        |        |        | ◆      |        |        |
| WNMG 080412EN-NMG1                 | 1,2 | 0,25 - 0,60    | 1,0 - 6,0      | ◆      | ◆      | ◆      |        |        |        | ◆      |        |        |
| WNMG 080404EN-NMR                  | 0,4 | 0,10 - 0,25    | 0,6 - 3,0      |        |        |        |        |        | ◆      |        |        |        |
| WNMG 080408EN-NMR                  | 0,8 | 0,12 - 0,30    | 0,8 - 4,0      |        |        |        | ◆      |        | ◆      |        |        |        |
| WNMG 080412EN-NMR                  | 1,2 | 0,15 - 0,32    | 1,0 - 4,0      |        |        |        | ◆      |        | ◆      |        |        |        |
| WNMG 060404EN-NMT                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        |        |        | ◆      |        |        |        |
| WNMG 060408EN-NMT                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        |        |        | ◆      |        |        |        |
| WNMG 080404EN-NMT                  | 0,4 | 0,05 - 0,12    | 0,2 - 1,0      |        |        |        | ◆      | ◆      | ◆      | ◆      |        |        |
| WNMG 080408EN-NMT                  | 0,8 | 0,07 - 0,16    | 0,4 - 1,5      |        |        |        | ◆      | ◆      | ◆      | ◆      |        |        |

# ISO Indexable inserts

Inserti a fissaggio meccanico-ISO  
Plaquettes de coupe amovibles ISO



| Designation<br>Articolo<br>Article | r   | f <sub>n</sub> | a <sub>p</sub> | HC     |        |        | HC     |        |        |        | HC     | HU     |        |
|------------------------------------|-----|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                                    |     |                |                | AP2320 | AP2335 | AP2420 | AM2130 | AM5110 | AM5120 | AM5130 | AK2310 | AS1010 | AS1020 |
| WNMG 060408EN-NMT1                 | 0,8 | 0,12 - 0,30    | 0,8 - 4,0      |        |        |        |        | ◆      | ◆      |        |        |        |        |
| WNMG 080408EN-NMT1                 | 0,8 | 0,12 - 0,30    | 0,8 - 4,0      |        |        |        | ◆      | ◆      | ◆      |        |        | ◆      | ◆      |
| WNMG 080412EN-NMT1                 | 1,2 | 0,15 - 0,32    | 1,0 - 4,0      |        |        |        | ◆      | ◆      | ◆      |        |        | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |   |   |   |   |   |   |  |   |   |
|---|---|---|---|---|---|---|---|---|--|---|---|
| P | ● | ● | ● |   | ○ | ○ | ○ | ○ |  |   |   |
| M |   |   |   | ● | ● | ● | ○ |   |  | ○ | ○ |
| K |   |   |   |   | ○ | ○ | ○ | ● |  |   |   |
| N |   |   |   |   | ○ | ○ | ● |   |  |   |   |
| S |   |   |   |   | ● | ● | ● |   |  | ● | ● |
| H |   |   |   |   | ○ | ○ | ○ |   |  |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

4

| Werkstoff-<br>gruppe            | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group  | Cutting speed Vc (m/min) |                 |                 |
|---------------------------------|---|---|---------------------|--|-----------------|--------------------------|-----------------|-----------------|
|                                 |   |   |                     |  |                 | HC                       |                 |                 |
|                                 |   |   |                     |  |                 | AL10                     | AL20            | AP2025          |
| P                               | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1              | 220 - 270 - 320          | 180 - 230 - 280 | 190 - 215 - 240 |
|                                 |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2              | 180 - 235 - 290          | 160 - 205 - 250 | 170 - 185 - 200 |
|                                 |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3              | 180 - 235 - 290          | 160 - 205 - 250 | 170 - 185 - 200 |
|                                 |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4              | 150 - 200 - 250          | 120 - 170 - 220 | 130 - 145 - 160 |
|                                 |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5              | 150 - 200 - 250          | 120 - 170 - 220 | 130 - 145 - 160 |
|                                 |   | Machinig steel (short-chipping) annealed        | 220                 | 745                                      | P6              | 150 - 200 - 250          | 120 - 170 - 220 | 130 - 145 - 160 |
|                                 | Low alloyed steel   | annealed  | 175                 | 591                                      | P7              | 180 - 230 - 280          | 160 - 205 - 250 | 170 - 185 - 200 |
|                                 |   | hardened and tempered                           | 300                 | 1013                                     | P8              | 170 - 210 - 250          | 140 - 185 - 230 | 100 - 130 - 160 |
|                                 |   | hardened and tempered                           | 380                 | 1282                                     | P9              | 150 - 185 - 220          | 120 - 160 - 200 | 80 - 110 - 140  |
|                                 |   | hardened and tempered                           | 430                 | 1477                                     | P10             | 150 - 185 - 220          | 120 - 160 - 200 | 80 - 110 - 140  |
|                                 | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11             | -                        | -               | 130 - 150 - 170 |
|                                 |   | hardened  | 300                 | 1013                                     | P12             | -                        | -               | 80 - 105 - 130  |
|                                 |   | hardened  | 400                 | 1361                                     | P13             | -                        | -               | 80 - 105 - 130  |
| Stainless steel                 | ferretic / martensitic, annealed                            | 200   | 675                 | P14                                      | 170 - 230 - 290 | 160 - 220 - 280          | 130 - 155 - 180 |                 |
|                                 | martensitic, hardened and tempered                          | 330   | 1114                | P15                                      | 140 - 210 - 280 | 130 - 205 - 280          | 110 - 135 - 160 |                 |
| M                               | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1              | 140 - 210 - 280          | 140 - 190 - 240 | 100 - 135 - 170 |
|                                 |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2              | -                        | -               | -               |
|                                 |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3              | -                        | -               | -               |
|                                 |   | ferritic  | 200                 | 675                                      | K1              | 150 - 180 - 210          | 130 - 165 - 200 | 150 - 190 - 230 |
| K                               | Malleable cast iron   | pearlitic                                       | 260                 | 867                                      | K2              | 150 - 180 - 210          | 130 - 165 - 200 | 120 - 145 - 170 |
|                                 |   | low tensile strength                            | 180                 | 602                                      | K3              | 180 - 240 - 300          | 160 - 215 - 270 | 130 - 165 - 200 |
|                                 | Cast iron   | high tensile strength / austenitic              | 245                 | 825                                      | K4              | 120 - 180 - 240          | 110 - 165 - 220 | -               |
|                                 |   | ferritic  | 155                 | 518                                      | K5              | 140 - 185 - 230          | 130 - 170 - 210 | 120 - 145 - 170 |
| Cast iron with nodular graphite | pearlitic   | 265   | 885                 | K6                                       | 120 - 145 - 170 | 110 - 130 - 150          | 120 - 155 - 190 |                 |
|                                 | GGV (CGI)   | 200   | 675                 | K7                                       | 180 - 240 - 300 | 160 - 215 - 270          | 130 - 165 - 200 |                 |
| N                               | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1              | -                        | -               | -               |
|                                 |   | heat treatable, heat treated                    | 100                 | 343                                      | N2              | -                        | -               | -               |
|                                 |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3              | -                        | -               | -               |
|                                 | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4              | -                        | -               | -               |
|                                 |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5              | -                        | -               | -               |
|                                 | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6              | -                        | -               | -               |
|                                 |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7              | -                        | -               | -               |
|                                 | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8              | -                        | -               | -               |
|                                 |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9              | -                        | -               | -               |
|                                 |   |   | 300                 | 1013                                     | N10             | -                        | -               | -               |
|                                 | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11             | -                        | -               | -               |
|                                 |   | Duroplastic (without abrasive filling material) | -                   | -  | N12             | -                        | -               | -               |
|                                 |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13             | -                        | -               | -               |
|                                 |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14             | -                        | -               | -               |
|                                 |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15             | -                        | -               | -               |
|                                 |   | Graphite (tech.)                                | 80 Shore            | -  | N16             | -                        | -               | -               |
| S                               | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1              | 20 - 35 - 50             | 20 - 35 - 50    | 20 - 30 - 40    |
|                                 |   | Fe-based heat treated                           | 280                 | 943                                      | S2              | 20 - 35 - 50             | 20 - 35 - 50    | 15 - 25 - 35    |
|                                 |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3              | 15 - 30 - 40             | 15 - 30 - 40    | 10 - 20 - 30    |
|                                 |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4              | 15 - 25 - 30             | 15 - 25 - 30    | 4 - 10 - 15     |
|                                 |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5              | 15 - 25 - 30             | 15 - 25 - 30    | 4 - 10 - 15     |
|                                 | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6              | -                        | -               | 80 - 105 - 130  |
|                                 |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7              | -                        | -               | 20 - 30 - 40    |
|                                 |   | β-alloys  | 410                 | 1396                                     | S8              | -                        | -               | 20 - 30 - 40    |
|                                 | Wolfram alloys  |   | 300                 | 1013                                     | S9              | -                        | -               | -               |
|                                 | Molybdän alloys   |   | 300                 | 1013                                     | S10             | -                        | -               | -               |
| H                               | Hardened steel  | hardened  | 50 HRC              | -  | H1              | -                        | -               | -               |
|                                 |   | hardened  | 55 HRC              | -  | H2              | -                        | -               | -               |
|                                 |   | hardened  | 60 HRC              | -  | H3              | -                        | -               | -               |
|                                 | Hardened cast iron  | hardened  | 55 HRC              | -  | H4              | -                        | -               | -               |

The recommended cutting data are only approximate values.  
It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated  
CC = Cermet coated  
CU = Cermet uncoated



# Recommended cutting data

| Material group                  | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group  | Cutting speed Vc (m/min) |                 |                 |
|---------------------------------|---|---|---------------------|--|-----------------|--------------------------|-----------------|-----------------|
|                                 |   |   |                     |  |                 | HC                       |                 |                 |
|                                 |   |   |                     |  |                 | AM350                    | AM35C           | AM5015          |
| P                               | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1              | 180 - 205 - 230          | 170 - 205 - 240 | 220 - 270 - 320 |
|                                 |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2              | 170 - 180 - 190          | 150 - 175 - 200 | 180 - 235 - 290 |
|                                 |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3              | 170 - 180 - 190          | 150 - 175 - 200 | 180 - 235 - 290 |
|                                 |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4              | 100 - 120 - 140          | 80 - 115 - 150  | 150 - 200 - 250 |
|                                 |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5              | 100 - 120 - 140          | 80 - 115 - 150  | 150 - 200 - 250 |
|                                 | Low alloyed steel   | Machinig steel (short-chipping) annealed        | 220                 | 745                                      | P6              | 100 - 120 - 140          | 80 - 115 - 150  | 150 - 200 - 250 |
|                                 |   | annealed  | 175                 | 591                                      | P7              | 170 - 180 - 190          | 150 - 175 - 200 | 180 - 230 - 280 |
|                                 |   | hardened and tempered                           | 300                 | 1013                                     | P8              | 90 - 120 - 150           | 80 - 120 - 160  | 170 - 210 - 250 |
|                                 |   | hardened and tempered                           | 380                 | 1282                                     | P9              | 70 - 100 - 130           | 60 - 100 - 140  | 150 - 185 - 220 |
|                                 |   | hardened and tempered                           | 430                 | 1477                                     | P10             | 70 - 100 - 130           | 60 - 100 - 140  | 150 - 185 - 220 |
|                                 | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11             | 120 - 160 - 200          | 110 - 140 - 170 | 80 - 120 - 160  |
|                                 |   | hardened  | 300                 | 1013                                     | P12             | 50 - 75 - 100            | 60 - 95 - 130   | 40 - 85 - 130   |
|                                 |   | hardened  | 400                 | 1361                                     | P13             | 50 - 75 - 100            | 60 - 95 - 130   | 40 - 85 - 130   |
| Stainless steel                 | ferretic / martensitic, annealed                            | 200   | 675                 | P14                                      | 140 - 160 - 180 | 110 - 145 - 180          | 60 - 120 - 180  |                 |
|                                 | martensitic, hardened and tempered                          | 330   | 1114                | P15                                      | 110 - 135 - 160 | 90 - 125 - 160           | 40 - 90 - 140   |                 |
| M                               | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1              | 120 - 155 - 190          | 100 - 135 - 170 | 80 - 120 - 160  |
|                                 |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2              | 80 - 115 - 150           | -               | 40 - 85 - 130   |
|                                 |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3              | 80 - 115 - 150           | -               | 40 - 85 - 130   |
| K                               | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1              | -                        | -               | 150 - 180 - 210 |
|                                 |   | pearlitic                                       | 260                 | 867                                      | K2              | -                        | -               | 150 - 180 - 210 |
|                                 | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3              | -                        | -               | 180 - 240 - 300 |
|                                 |   | high tensile strength / austenitic              | 245                 | 825                                      | K4              | -                        | -               | 120 - 180 - 240 |
| Cast iron with nodular graphite | ferritic  | 155   | 518                 | K5                                       | -               | -                        | 140 - 185 - 230 |                 |
|                                 | pearlitic   | 265   | 885                 | K6                                       | -               | -                        | 120 - 145 - 170 |                 |
| GGV (CGI)                       |   | 200   | 675                 | K7                                       | -               | -                        | 180 - 240 - 300 |                 |
| N                               | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1              | -                        | -               | -               |
|                                 |   | heat treatable, heat treated                    | 100                 | 343                                      | N2              | -                        | -               | -               |
|                                 |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3              | -                        | -               | -               |
|                                 | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4              | -                        | -               | -               |
|                                 |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5              | -                        | -               | -               |
|                                 | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6              | -                        | -               | -               |
|                                 |   | Unalloyed, electrolyte copper                   | 100                 | 343                                      | N7              | -                        | -               | 100 - 210 - 320 |
|                                 | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8              | -                        | -               | 200 - 350 - 500 |
|                                 |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9              | -                        | -               | 200 - 350 - 500 |
|                                 |   |   | 300                 | 1013                                     | N10             | -                        | -               | -               |
|                                 | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11             | -                        | -               | 160 - 380 - 600 |
|                                 |   | Duroplastic (without abrasive filling material) | -                   | -  | N12             | -                        | -               | 160 - 380 - 600 |
|                                 |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13             | -                        | -               | 100 - 200 - 300 |
|                                 |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14             | -                        | -               | 100 - 200 - 300 |
|                                 |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15             | -                        | -               | 100 - 200 - 300 |
|                                 |   | Graphite (tech.)                                | 80 Shore            | -  | N16             | -                        | -               | -               |
| S                               | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1              | 20 - 30 - 40             | -               | 20 - 40 - 60    |
|                                 |   | Fe-based heat treated                           | 280                 | 943                                      | S2              | 15 - 25 - 35             | -               | 20 - 40 - 60    |
|                                 |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3              | 8 - 15 - 25              | -               | 15 - 35 - 50    |
|                                 |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4              | 4 - 10 - 15              | -               | 15 - 30 - 40    |
|                                 |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5              | 4 - 10 - 15              | -               | 15 - 30 - 40    |
|                                 | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6              | -                        | -               | 90 - 135 - 180  |
|                                 |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7              | -                        | -               | 40 - 60 - 80    |
|                                 |   | β-alloys  | 410                 | 1396                                     | S8              | -                        | -               | 40 - 60 - 80    |
|                                 | Wolfram alloys  |   | 300                 | 1013                                     | S9              | -                        | -               | -               |
|                                 | Molybdän alloys   |   | 300                 | 1013                                     | S10             | -                        | -               | -               |
| H                               | Hardened steel  | hardened  | 50 HRC              | -  | H1              | -                        | -               | 30 - 40 - 50    |
|                                 |   | hardened  | 55 HRC              | -  | H2              | -                        | -               | 10 - 20 - 25    |
|                                 |   | hardened  | 60 HRC              | -  | H3              | -                        | -               | 10 - 20 - 25    |
|                                 | Hardened cast iron  | hardened  | 55 HRC              | -  | H4              | -                        | -               | 10 - 20 - 25    |

The recommended cutting data are only approximate values.  
It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated  
HU = Solid carbide uncoated





# Recommended cutting data

| Material group   | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                   |                   |
|------------------|---|---|---------------------|--|----------------|--------------------------|-------------------|-------------------|
|                  |   |   |                     |  |                | HC                       |                   |                   |
|                  |   |   |                     |  |                | AD2                      | AT10              | AT20              |
| <b>P</b>         | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | -                        | 220 - 270 - 320   | 180 - 230 - 280   |
|                  |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | -                        | 180 - 235 - 290   | 160 - 205 - 250   |
|                  |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | -                        | 180 - 235 - 290   | 160 - 205 - 250   |
|                  |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | -                        | 150 - 200 - 250   | 120 - 170 - 220   |
|                  |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | -                        | 150 - 200 - 250   | 120 - 170 - 220   |
|                  |   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | -                        | 150 - 200 - 250   | 120 - 170 - 220   |
|                  | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | -                        | 180 - 230 - 280   | 160 - 205 - 250   |
|                  |   | hardened and tempered                           | 300                 | 1013                                     | P8             | -                        | 170 - 210 - 250   | 140 - 185 - 230   |
|                  |   | hardened and tempered                           | 380                 | 1282                                     | P9             | -                        | 150 - 185 - 220   | 120 - 160 - 200   |
|                  |   | hardened and tempered                           | 430                 | 1477                                     | P10            | -                        | 150 - 185 - 220   | 120 - 160 - 200   |
|                  | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | -                        | -                 | -                 |
|                  |   | hardened  | 300                 | 1013                                     | P12            | -                        | -                 | -                 |
|                  |   | hardened  | 400                 | 1361                                     | P13            | -                        | -                 | -                 |
|                  | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | -                        | 170 - 230 - 290   | 160 - 220 - 280   |
|                  |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | -                        | 140 - 210 - 280   | 130 - 205 - 280   |
| <b>M</b>         | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | -                        | 140 - 210 - 280   | 140 - 190 - 240   |
|                  |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | -                        | -                 | -                 |
|                  |   | austenitic-ferretic, Duplex                     | 230                 | 778                                      | M3             | -                        | -                 | -                 |
| <b>K</b>         | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | -                        | 150 - 180 - 210   | 130 - 165 - 200   |
|                  |   | pearlitic                                       | 260                 | 867                                      | K2             | -                        | 150 - 180 - 210   | 130 - 165 - 200   |
|                  | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | -                        | 180 - 240 - 300   | 160 - 215 - 270   |
|                  |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | -                        | 120 - 180 - 240   | 110 - 165 - 220   |
|                  | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | -                        | 140 - 185 - 230   | 130 - 170 - 210   |
|                  |   | pearlitic                                       | 265                 | 885                                      | K6             | -                        | 120 - 145 - 170   | 110 - 130 - 150   |
|                  | GGV (CGI)   |   | 200                 | 675                                      | K7             | -                        | 180 - 240 - 300   | 160 - 215 - 270   |
| <b>N</b>         | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | 650 - 1325 - 2000        | 850 - 1075 - 1300 | 850 - 1075 - 1300 |
|                  |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | 300 - 1150 - 2000        | 400 - 650 - 900   | 400 - 650 - 900   |
|                  |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | 650 - 1325 - 2000        | 260 - 530 - 800   | 260 - 530 - 800   |
|                  | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | 300 - 1150 - 2000        | 200 - 375 - 550   | 200 - 375 - 550   |
|                  |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | 200 - 1100 - 2000        | 200 - 350 - 500   | 200 - 350 - 500   |
|                  | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -                 | -                 |
|                  |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | 130 - 265 - 400          | -                 | -                 |
|                  | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | 250 - 525 - 800          | -                 | -                 |
|                  |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | 250 - 525 - 800          | -                 | -                 |
|                  |   |   | 300                 | 1013                                     | N10            | -                        | -                 | -                 |
|                  | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -                 | -                 |
|                  |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -                 | -                 |
|                  |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -                 | -                 |
|                  |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -                 | -                 |
|                  |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -                 | -                 |
| Graphite (tech.) |   | 80 Shore  | -                   | N16                                      | -              | -                        | -                 |                   |
| <b>S</b>         | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | -                        | 20 - 35 - 50      | 20 - 35 - 50      |
|                  |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | -                        | 20 - 35 - 50      | 20 - 35 - 50      |
|                  |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | -                        | 15 - 30 - 40      | 15 - 30 - 40      |
|                  |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | -                        | 15 - 25 - 30      | 15 - 25 - 30      |
|                  |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | 15 - 25 - 30      | 15 - 25 - 30      |
|                  | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -                 | -                 |
|                  |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -                 | -                 |
|                  |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -                 | -                 |
|                  | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -                 | -                 |
|                  | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -                 | -                 |
| <b>H</b>         | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -                 | -                 |
|                  |   | hardened  | 55 HRC              | -  | H2             | -                        | -                 | -                 |
|                  |   | hardened  | 60 HRC              | -  | H3             | -                        | -                 | -                 |
|                  | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -                 | -                 |

The recommended cutting data are only approximate values.  
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HC = Solid carbide coated  
HU = Solid carbide uncoated

|  | PVD1             | PVD2             | AM4205        |
|--|------------------|------------------|---------------|
|  | 200 - 245 - 290  | 160 - 205 - 250  | -             |
|  | 160 - 210 - 260  | 140 - 180 - 220  | -             |
|  | 160 - 210 - 260  | 140 - 180 - 220  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 160 - 205 - 250  | 140 - 180 - 220  | -             |
|  | 150 - 190 - 230  | 130 - 165 - 200  | -             |
|  | 130 - 165 - 200  | 110 - 150 - 190  | -             |
|  | 130 - 165 - 200  | 110 - 150 - 190  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 150 - 155 - 160  | 130 - 175 - 220  | -             |
|  | 120 - 185 - 250  | 110 - 155 - 200  | -             |
|  | 120 - 185 - 250  | 120 - 160 - 200  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 130 - 155 - 180  | -                | -             |
|  | 130 - 155 - 180  | -                | -             |
|  | 160 - 215 - 270  | -                | -             |
|  | 110 - 165 - 220  | -                | -             |
|  | 120 - 165 - 210  | -                | -             |
|  | 110 - 130 - 150  | -                | -             |
|  | 160 - 215 - 270  | -                | -             |
|  | 750 - 975 - 1200 | 750 - 975 - 1200 | -             |
|  | 350 - 575 - 800  | 350 - 575 - 800  | -             |
|  | 230 - 465 - 700  | 230 - 465 - 700  | -             |
|  | 180 - 340 - 500  | 180 - 340 - 500  | -             |
|  | 180 - 315 - 450  | 180 - 315 - 450  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 15 - 30 - 45     | 15 - 30 - 45     | -             |
|  | 15 - 30 - 45     | 15 - 30 - 45     | -             |
|  | 10 - 25 - 35     | 10 - 25 - 35     | -             |
|  | 10 - 20 - 25     | 10 - 20 - 25     | -             |
|  | 10 - 20 - 25     | 10 - 20 - 25     | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | 40 - 60 - 80  |
|  | -                | -                | 40 - 60 - 80  |
|  | -                | -                | 60 - 80 - 100 |

# Recommended cutting data

| Material group                                  | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                   |                   |
|---|---|---|---------------------|--|----------------|--------------------------|-------------------|-------------------|
|   |   |   |                     |  |                | HU                       |                   |                   |
|   |   |   |                     |  |                | AK10                     | AK1010            | AK1020            |
| <b>P</b>  | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | -                        | -                 | -                 |
|   |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | -                        | -                 | -                 |
|   |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | -                        | -                 | -                 |
|   |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | -                        | -                 | -                 |
|   |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | -                        | -                 | -                 |
|   |   | Machining steel (short-chipping) annealed       | 220                 | 745                                      | P6             | -                        | -                 | -                 |
|   | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | -                        | -                 | -                 |
|   |   | hardened and tempered                           | 300                 | 1013                                     | P8             | -                        | -                 | -                 |
|   |   | hardened and tempered                           | 380                 | 1282                                     | P9             | -                        | -                 | -                 |
|   |   | hardened and tempered                           | 430                 | 1477                                     | P10            | -                        | -                 | -                 |
|   | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | -                        | -                 | -                 |
|   |   | hardened  | 300                 | 1013                                     | P12            | -                        | -                 | -                 |
|   |   | hardened  | 400                 | 1361                                     | P13            | -                        | -                 | -                 |
|   | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | -                        | -                 | -                 |
|   |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | -                        | -                 | -                 |
| <b>M</b>  | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | -                        | -                 | -                 |
|   |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | -                        | -                 | -                 |
|   |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | -                        | -                 | -                 |
|   |   | ferritic  | 200                 | 675                                      | K1             | 140 - 170 - 200          | 140 - 170 - 200   | 140 - 170 - 200   |
| <b>K</b>  | Malleable cast iron   | pearlitic                                       | 260                 | 867                                      | K2             | 120 - 140 - 160          | 120 - 140 - 160   | 120 - 140 - 160   |
|   |   | low tensile strength                            | 180                 | 602                                      | K3             | 120 - 140 - 160          | 120 - 140 - 160   | 120 - 140 - 160   |
|   | Cast iron   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 80 - 110 - 140           | 80 - 110 - 140    | 80 - 110 - 140    |
|   |   | ferritic  | 155                 | 518                                      | K5             | 130 - 150 - 170          | 130 - 150 - 170   | 130 - 150 - 170   |
| <b>N</b>  | Cast iron with nodular graphite                             | pearlitic                                       | 265                 | 885                                      | K6             | 90 - 110 - 130           | 90 - 110 - 130    | 90 - 110 - 130    |
|   |   | GGV (CGI)                                       | 200                 | 675                                      | K7             | 120 - 140 - 160          | 120 - 140 - 160   | 120 - 140 - 160   |
|   |   | Aluminium alloys long chipping                  | not heat treatable  | 30                                       | -              | N1                       | 300 - 1400 - 2500 | 300 - 1400 - 2500 |
| <b>N</b>  | Aluminium alloys long chipping                              | heat treatable, heat treated                    | 100                 | 343                                      | N2             | 200 - 1100 - 2000        | 200 - 1100 - 2000 | 200 - 1100 - 2000 |
|   |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | 400 - 950 - 1500         | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | 400 - 950 - 1500         | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | 200 - 500 - 800          | 200 - 500 - 800   | 200 - 500 - 800   |
|   | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -                 | -                 |
|   |   | Unalloyed, electrolyte copper                   | 100                 | 343                                      | N7             | 150 - 225 - 300          | 150 - 225 - 300   | 150 - 225 - 300   |
|   | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | 200 - 400 - 600          | 200 - 400 - 600   | 200 - 400 - 600   |
|   |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | 250 - 425 - 600          | 250 - 425 - 600   | 250 - 425 - 600   |
|   |   |   | 300                 | 1013                                     | N10            | -                        | -                 | -                 |
|   | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | 80 - 130 - 180           | 80 - 130 - 180    | 80 - 130 - 180    |
| Duroplastic (without abrasive filling material) |   | -   | -                   | N12                                      | 80 - 130 - 180 | 80 - 130 - 180           | 80 - 130 - 180    |                   |
| Plastic glas fibre reinforced GFRP              |   | -   | -                   | N13                                      | 60 - 105 - 150 | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Plastic carbon fibre reinforced CFRP            |   | -   | -                   | N14                                      | 60 - 105 - 150 | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Plastic aramid fibre reinforced AFRP            |   | -   | -                   | N15                                      | 60 - 105 - 150 | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Graphite (tech.)                                |   | 80 Shore  | -                   | N16                                      | -              | -                        | -                 |                   |
| <b>S</b>  | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | 15 - 30 - 40             | 15 - 30 - 40      | -                 |
|   |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | 8 - 20 - 28              | 8 - 20 - 28       | -                 |
|   |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | 10 - 20 - 30             | 10 - 20 - 30      | -                 |
|   |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | 8 - 15 - 25              | 8 - 15 - 25       | -                 |
|   |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | 8 - 15 - 25              | 8 - 15 - 25       | -                 |
|   | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | 60 - 90 - 120            | 60 - 90 - 120     | 60 - 90 - 120     |
|   |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | 30 - 55 - 80             | 30 - 55 - 80      | 30 - 55 - 80      |
|   |   | β-alloys  | 410                 | 1396                                     | S8             | 30 - 55 - 80             | 30 - 55 - 80      | 30 - 55 - 80      |
|   | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -                 | -                 |
|   | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -                 | -                 |
| <b>H</b>  | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -                 | -                 |
|   |   | hardened  | 55 HRC              | -  | H2             | -                        | -                 | -                 |
|   |   | hardened  | 60 HRC              | -  | H3             | -                        | -                 | -                 |
|   | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -                 | -                 |

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It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated  
HU = Solid carbide uncoated



| Material group  | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                 |
|-----------------|---|---|---------------------|--|----------------|--------------------------|-----------------|
|                 |   |   |                     |  |                | CC                       |                 |
|                 |   |   |                     |  |                | AP6510                   | AC90C           |
| P               | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 300 - 350 - 400          | 220 - 270 - 320 |
|                 |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 260 - 305 - 350          | 180 - 235 - 290 |
|                 |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 260 - 305 - 350          | 180 - 235 - 290 |
|                 |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 240 - 270 - 300          | 150 - 200 - 250 |
|                 |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 240 - 270 - 300          | 150 - 200 - 250 |
|                 |   | Machinig steel (short-chipping) annealed        | 220                 | 745                                      | P6             | 240 - 270 - 300          | 150 - 200 - 250 |
|                 | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | 220 - 260 - 300          | 180 - 220 - 260 |
|                 |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 180 - 220 - 260          | 150 - 185 - 220 |
|                 |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 120 - 170 - 220          | 80 - 135 - 190  |
|                 |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 120 - 170 - 220          | 80 - 135 - 190  |
|                 | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 150 - 185 - 220          | 80 - 115 - 150  |
|                 |   | hardened  | 300                 | 1013                                     | P12            | 70 - 110 - 150           | 40 - 85 - 130   |
|                 |   | hardened  | 400                 | 1361                                     | P13            | 70 - 110 - 150           | 40 - 85 - 130   |
| Stainless steel | ferretic / martensitic, annealed                            | 200   | 675                 | P14                                      | -              | 40 - 95 - 150            |                 |
|                 | martensitic, hardened and tempered                          | 330   | 1114                | P15                                      | -              | 40 - 90 - 140            |                 |
| M               | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | -                        | 80 - 120 - 160  |
|                 |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | -                        | 40 - 85 - 130   |
|                 |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | -                        | 40 - 85 - 130   |
| K               | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | -                        | 150 - 180 - 210 |
|                 |   | pearlitic                                       | 260                 | 867                                      | K2             | -                        | 150 - 180 - 210 |
|                 | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | -                        | 180 - 240 - 300 |
|                 |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | -                        | 120 - 180 - 240 |
|                 | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | -                        | 140 - 185 - 230 |
|                 |   | pearlitic                                       | 265                 | 885                                      | K6             | -                        | 120 - 145 - 170 |
|                 | GGV (CGI)   |   | 200                 | 675                                      | K7             | -                        | 180 - 240 - 300 |
| N               | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | -                        | -               |
|                 |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | -                        | -               |
|                 |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | -                        | -               |
|                 | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | -                        | -               |
|                 |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | -                        | -               |
|                 | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -               |
|                 |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | -                        | 120 - 160 - 200 |
|                 | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | -                        | 200 - 350 - 500 |
|                 |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | -                        | 200 - 350 - 500 |
|                 |   |   | 300                 | 1013                                     | N10            | -                        | -               |
|                 | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | 160 - 380 - 600 |
|                 |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | 160 - 380 - 600 |
|                 |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | 100 - 200 - 300 |
|                 |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | 100 - 200 - 300 |
|                 |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | 100 - 200 - 300 |
|                 |   | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -               |
| S               | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | -                        | 20 - 40 - 60    |
|                 |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | -                        | 20 - 40 - 60    |
|                 |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | -                        | 15 - 35 - 50    |
|                 |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | -                        | 15 - 30 - 40    |
|                 |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | 15 - 30 - 40    |
|                 | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | 90 - 135 - 180  |
|                 |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | 40 - 60 - 80    |
|                 |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | 40 - 60 - 80    |
|                 | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -               |
|                 | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -               |
| H               | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | 30 - 40 - 50    |
|                 |   | hardened  | 55 HRC              | -  | H2             | -                        | 10 - 20 - 25    |
|                 |   | hardened  | 60 HRC              | -  | H3             | -                        | 10 - 20 - 25    |
|                 | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | 10 - 20 - 25    |

The recommended cutting data are only approximate values.  
It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated  
HU = Solid carbide uncoated  
CC = Cermet coated

| Material group | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                 |
|----------------|---|---|---------------------|--|----------------|--------------------------|-----------------|
|                |   |   |                     |  |                | CU                       |                 |
|                |   |   |                     |  |                | ACE6                     | AP6010          |
| <b>P</b>       | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 100 - 250 - 400          | 100 - 275 - 450 |
|                |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 80 - 225 - 370           | 80 - 265 - 450  |
|                |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 80 - 225 - 370           | 80 - 265 - 450  |
|                |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 50 - 200 - 350           | 50 - 200 - 350  |
|                |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 50 - 200 - 350           | 50 - 200 - 350  |
|                |   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | 50 - 200 - 350           | 50 - 200 - 350  |
|                | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | 80 - 190 - 300           | 80 - 265 - 450  |
|                |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 70 - 170 - 270           | 70 - 260 - 450  |
|                |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 50 - 150 - 250           | 50 - 200 - 350  |
|                |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 50 - 150 - 250           | 50 - 200 - 350  |
|                | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 80 - 140 - 200           | 60 - 155 - 250  |
|                |   | hardened  | 300                 | 1013                                     | P12            | 50 - 105 - 160           | 50 - 115 - 180  |
|                |   | hardened  | 400                 | 1361                                     | P13            | 50 - 105 - 160           | 50 - 115 - 180  |
|                | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | 80 - 165 - 250           | 80 - 190 - 300  |
|                |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | 80 - 165 - 250           | 80 - 215 - 350  |
| <b>M</b>       | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | 80 - 160 - 240           | 80 - 190 - 300  |
|                |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | 80 - 160 - 240           | 60 - 180 - 300  |
|                |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | 80 - 160 - 240           | 60 - 180 - 300  |
| <b>K</b>       | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | 80 - 215 - 350           | 100 - 200 - 300 |
|                |   | pearlitic                                       | 260                 | 867                                      | K2             | 60 - 155 - 250           | 100 - 200 - 300 |
| <b>K</b>       | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | 80 - 190 - 300           | 100 - 200 - 300 |
|                |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 80 - 160 - 240           | 100 - 200 - 300 |
|                | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | 80 - 190 - 300           | 100 - 200 - 300 |
|                |   | pearlitic                                       | 265                 | 885                                      | K6             | 80 - 165 - 250           | 100 - 200 - 300 |
|                | GGV (CGI)   |   | 200                 | 675                                      | K7             | 80 - 190 - 300           | 100 - 200 - 300 |
| <b>N</b>       | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | -                        | -               |
|                |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | -                        | -               |
|                |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | -                        | -               |
|                | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | -                        | -               |
|                |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | -                        | -               |
|                | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -               |
|                |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | -                        | -               |
|                | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | -                        | -               |
|                |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | -                        | -               |
|                |   |   | 300                 | 1013                                     | N10            | -                        | -               |
|                | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -               |
|                |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -               |
|                |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -               |
|                |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -               |
|                |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -               |
|                |   | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -               |
| <b>S</b>       | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | -                        | -               |
|                |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | -                        | -               |
|                |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | -                        | -               |
|                |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | -                        | -               |
|                |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | -               |
|                | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -               |
|                |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -               |
|                |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -               |
|                | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -               |
|                | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -               |
| <b>H</b>       | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -               |
|                |   | hardened  | 55 HRC              | -  | H2             | -                        | -               |
|                |   | hardened  | 60 HRC              | -  | H3             | -                        | -               |
|                | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -               |

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It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated  
HU = Solid carbide uncoated

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| Material group                                  | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group  | Cutting speed Vc (m/min) |                   |                   |
|---|---|---|---------------------|--|-----------------|--------------------------|-------------------|-------------------|
|   |   |   |                     |  |                 | HU                       |                   |                   |
|   |   |   |                     |  |                 | AM350                    | AK1020            | AK10              |
| P   | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1              | 180 - 205 - 230          | -                 | -                 |
|   |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2              | 170 - 180 - 190          | -                 | -                 |
|   |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3              | 170 - 180 - 190          | -                 | -                 |
|   |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4              | 100 - 120 - 140          | -                 | -                 |
|   |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5              | 100 - 120 - 140          | -                 | -                 |
|   | Low alloyed steel   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6              | 100 - 120 - 140          | -                 | -                 |
|   |   | annealed  | 175                 | 591                                      | P7              | 170 - 180 - 190          | -                 | -                 |
|   |   | hardened and tempered                           | 300                 | 1013                                     | P8              | 90 - 120 - 150           | -                 | -                 |
|   |   | hardened and tempered                           | 380                 | 1282                                     | P9              | 70 - 100 - 130           | -                 | -                 |
|   |   | hardened and tempered                           | 430                 | 1477                                     | P10             | 70 - 100 - 130           | -                 | -                 |
|   | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11             | 120 - 160 - 200          | -                 | -                 |
|   |   | hardened  | 300                 | 1013                                     | P12             | 50 - 75 - 100            | -                 | -                 |
|   |   | hardened  | 400                 | 1361                                     | P13             | 50 - 75 - 100            | -                 | -                 |
| Stainless steel                                 | ferretic / martensitic, annealed                            | 200   | 675                 | P14                                      | 140 - 160 - 180 | -                        | -                 |                   |
|   | martensitic, hardened and tempered                          | 330   | 1114                | P15                                      | 110 - 135 - 160 | -                        | -                 |                   |
| M   | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1              | 120 - 155 - 190          | -                 | -                 |
|   |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2              | 80 - 115 - 150           | -                 | -                 |
|   |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3              | 80 - 115 - 150           | -                 | -                 |
| K   | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1              | -                        | 140 - 170 - 200   | 140 - 170 - 200   |
|   |   | pearlitic                                       | 260                 | 867                                      | K2              | -                        | 120 - 140 - 160   | 120 - 140 - 160   |
|   | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3              | -                        | 120 - 140 - 160   | 120 - 140 - 160   |
|   |   | high tensile strength / austenitic              | 245                 | 825                                      | K4              | -                        | 80 - 110 - 140    | 80 - 110 - 140    |
|   | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5              | -                        | 130 - 150 - 170   | 130 - 150 - 170   |
|   |   | pearlitic                                       | 265                 | 885                                      | K6              | -                        | 90 - 110 - 130    | 90 - 110 - 130    |
|   | GGV (CGI)   |   | 200                 | 675                                      | K7              | -                        | 120 - 140 - 160   | 120 - 140 - 160   |
| N   | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1              | -                        | 300 - 1400 - 2500 | 300 - 1400 - 2500 |
|   |   | heat treatable, heat treated                    | 100                 | 343                                      | N2              | -                        | 200 - 1100 - 2000 | 200 - 1100 - 2000 |
|   |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3              | -                        | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4              | -                        | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5              | -                        | 200 - 500 - 800   | 200 - 500 - 800   |
|   | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6              | -                        | -                 | -                 |
|   |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7              | -                        | 150 - 225 - 300   | 150 - 225 - 300   |
|   | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8              | -                        | 200 - 400 - 600   | 200 - 400 - 600   |
|   |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9              | -                        | 250 - 425 - 600   | 250 - 425 - 600   |
|   |   |   | 300                 | 1013                                     | N10             | -                        | -                 | -                 |
|   | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11             | -                        | 80 - 130 - 180    | 80 - 130 - 180    |
| Duroplastic (without abrasive filling material) |   | -   | -                   | N12                                      | -               | 80 - 130 - 180           | 80 - 130 - 180    |                   |
| Plastic glas fibre reinforced GFRP              |   | -   | -                   | N13                                      | -               | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Plastic carbon fibre reinforced CFRP            |   | -   | -                   | N14                                      | -               | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Plastic aramid fibre reinforced AFRP            |   | -   | -                   | N15                                      | -               | 60 - 105 - 150           | 60 - 105 - 150    |                   |
| Graphite (tech.)                                |   | 80 Shore  | -                   | N16                                      | -               | -                        | -                 |                   |
| S   | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1              | 20 - 30 - 40             | -                 | 15 - 30 - 40      |
|   |   | Fe-based heat treated                           | 280                 | 943                                      | S2              | 15 - 25 - 35             | -                 | 8 - 20 - 28       |
|   |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3              | 8 - 15 - 25              | -                 | 10 - 20 - 30      |
|   |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4              | 4 - 10 - 15              | -                 | 8 - 15 - 25       |
|   |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5              | 4 - 10 - 15              | -                 | 8 - 15 - 25       |
|   | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6              | -                        | 60 - 90 - 120     | 60 - 90 - 120     |
|   |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7              | -                        | 30 - 55 - 80      | 30 - 55 - 80      |
| Wolfram alloys                                  |   | 410   | 1396                | S8                                       | -               | 30 - 55 - 80             | 30 - 55 - 80      |                   |
| Molybdän alloys                                 |   | 300   | 1013                | S9                                       | -               | -                        | -                 |                   |
|   |   | 300   | 1013                | S10                                      | -               | -                        | -                 |                   |
| H   | Hardened steel  | hardened  | 50 HRC              | -  | H1              | -                        | -                 | -                 |
|   |   | hardened  | 55 HRC              | -  | H2              | -                        | -                 | -                 |
|   |   | hardened  | 60 HRC              | -  | H3              | -                        | -                 | -                 |
|   | Hardened cast iron  | hardened  | 55 HRC              | -  | H4              | -                        | -                 | -                 |

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HC = Solid carbide coated  
HU = Solid carbide uncoated  
CC = Cermet coated

|  |                 |                 |        | HC              |
|--|-----------------|-----------------|--------|-----------------|
|  | AM5120          | AM5220          | AM5015 | AM2030          |
|  | 220 - 270 - 320 | 180 - 230 - 280 | -      | 170 - 195 - 220 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 180 - 220 - 260 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 185 - 220 | 140 - 185 - 230 | -      | 80 - 110 - 140  |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 115 - 150  | 70 - 110 - 150  | -      | 110 - 150 - 190 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 95 - 150   | 50 - 105 - 160  | -      | 130 - 150 - 170 |
|  | 40 - 90 - 140   | 40 - 90 - 140   | -      | 100 - 125 - 150 |
|  | 80 - 120 - 160  | 70 - 110 - 150  | -      | 100 - 140 - 180 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | 120 - 180 - 240 | 120 - 180 - 240 | -      | -               |
|  | 140 - 185 - 230 | 140 - 185 - 230 | -      | -               |
|  | 120 - 145 - 170 | 120 - 145 - 170 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 120 - 160 - 200 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 20 - 30 - 40    |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 15 - 25 - 35    |
|  | 15 - 35 - 50    | 15 - 35 - 50    | -      | 8 - 15 - 25     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 90 - 135 - 180  | -               | -      | 80 - 105 - 130  |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 30 - 40 - 50    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |



| Gruppo materiale         | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                 |                 |
|--------------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|-----------------|-----------------|
|                          |  |   |                 |                                    |                  | HC                            |                 |                 |
|                          |  |   |                 |                                    |                  | AL10                          | AL20            | AP2025          |
| P                        | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | 220 - 270 - 320               | 180 - 230 - 280 | 190 - 215 - 240 |
|                          |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | 180 - 235 - 290               | 160 - 205 - 250 | 170 - 185 - 200 |
|                          |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | 180 - 235 - 290               | 160 - 205 - 250 | 170 - 185 - 200 |
|                          |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | 150 - 200 - 250               | 120 - 170 - 220 | 130 - 145 - 160 |
|                          |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | 150 - 200 - 250               | 120 - 170 - 220 | 130 - 145 - 160 |
|                          | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | 150 - 200 - 250               | 120 - 170 - 220 | 130 - 145 - 160 |
|                          |  | ricotto   | 175             | 591                                | P7               | 180 - 230 - 280               | 160 - 205 - 250 | 170 - 185 - 200 |
|                          |  | bonificato  | 300             | 1013                               | P8               | 170 - 210 - 250               | 140 - 185 - 230 | 100 - 130 - 160 |
|                          |  | bonificato  | 380             | 1282                               | P9               | 150 - 185 - 220               | 120 - 160 - 200 | 80 - 110 - 140  |
|                          |  | bonificato  | 430             | 1477                               | P10              | 150 - 185 - 220               | 120 - 160 - 200 | 80 - 110 - 140  |
|                          | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | -                             | -               | 130 - 150 - 170 |
|                          |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | -                             | -               | 80 - 105 - 130  |
|                          |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | -                             | -               | 80 - 105 - 130  |
|                          | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | 170 - 230 - 290               | 160 - 220 - 280 | 130 - 155 - 180 |
| martensitico, bonificato |  | 330   | 1114            | P15                                | 140 - 210 - 280  | 130 - 205 - 280               | 110 - 135 - 160 |                 |
| M                        | Acciai inossidabili  | austenitico, trattato o temperato                         | 200             | 675                                | M1               | 140 - 210 - 280               | 140 - 190 - 240 | 100 - 135 - 170 |
|                          |  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | -                             | -               | -               |
|                          |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | -                             | -               | -               |
|                          |  |   | 200             | 675                                | K1               | 150 - 180 - 210               | 130 - 165 - 200 | 150 - 190 - 230 |
| K                        | Ghisa temprata   | ferritico   | 200             | 675                                | K1               | 150 - 180 - 210               | 130 - 165 - 200 | 150 - 190 - 230 |
|                          |  | perlitica   | 260             | 867                                | K2               | 150 - 180 - 210               | 130 - 165 - 200 | 120 - 145 - 170 |
|                          | Ghisa grigia   | bassa resistenza  | 180             | 602                                | K3               | 180 - 240 - 300               | 160 - 215 - 270 | 130 - 165 - 200 |
|                          |  | alta resistenza / austenitico                             | 245             | 825                                | K4               | 120 - 180 - 240               | 110 - 165 - 220 | -               |
| Ghisa sferoidale         | ferritico  | 155   | 518             | K5                                 | 140 - 185 - 230  | 130 - 170 - 210               | 120 - 145 - 170 |                 |
|                          | perlitica  | 265   | 885             | K6                                 | 120 - 145 - 170  | 110 - 130 - 150               | 120 - 155 - 190 |                 |
| GGV (CGI)                |  | 200   | 675             | K7                                 | 180 - 240 - 300  | 160 - 215 - 270               | 130 - 165 - 200 |                 |
| N                        | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | -                             | -               | -               |
|                          |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | -                             | -               | -               |
|                          | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | -                             | -               | -               |
|                          |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | -                             | -               | -               |
|                          | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | -                             | -               | -               |
|                          |  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -               | -               |
|                          | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | -                             | -               | -               |
|                          |  | Ottone, Bronzo  | 90              | 314                                | N8               | -                             | -               | -               |
|                          |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | -                             | -               | -               |
|                          |  |   | 300             | 1013                               | N10              | -                             | -               | -               |
|                          | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | -               | -               |
|                          |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | -               | -               |
|                          |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | -               | -               |
|                          |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | -               | -               |
|                          |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | -               | -               |
|                          |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -               | -               |
| S                        | Leghe resistenti al calore                                 | Base-Fe ricotto   | 200             | 675                                | S1               | 20 - 35 - 50                  | 20 - 35 - 50    | 20 - 30 - 40    |
|                          |  | Base-Fe invecchiato                                       | 280             | 943                                | S2               | 20 - 35 - 50                  | 20 - 35 - 50    | 15 - 25 - 35    |
|                          |  | Base Ni o Co ricotto                                      | 250             | 839                                | S3               | 15 - 30 - 40                  | 15 - 30 - 40    | 10 - 20 - 30    |
|                          |  | Base Ni o Co invecchiato                                  | 350             | 1177                               | S4               | 15 - 25 - 30                  | 15 - 25 - 30    | 4 - 10 - 15     |
|                          |  | Base Ni o Co da fusione                                   | 320             | 1076                               | S5               | 15 - 25 - 30                  | 15 - 25 - 30    | 4 - 10 - 15     |
|                          | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | -                             | -               | 80 - 105 - 130  |
|                          |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | -               | 20 - 30 - 40    |
|                          |  | Leghe β   | 410             | 1396                               | S8               | -                             | -               | 20 - 30 - 40    |
|                          | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -               | -               |
|                          | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -               | -               |
| H                        | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -               | -               |
|                          |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -               | -               |
|                          |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -               | -               |
|                          | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -               | -               |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

CC = Cermet rivestito

CU = Cermet non rivestito



| Gruppo materiale        | Struttura dei gruppi di materiali e lettere di riferimento |  | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                 |                 |
|-------------------------|--|--|-----------------|------------------------------------|------------------|-------------------------------|-----------------|-----------------|
|                         |  |  |                 |                                    |                  | HC                            |                 |                 |
|                         |  |  |                 |                                    |                  | AM350                         | AM35C           | AM5015          |
| <b>P</b>                | Acciai non legato  | C ≤ 0,25 % ricotto                               | 125             | 428                                | P1               | 180 - 205 - 230               | 170 - 205 - 240 | 220 - 270 - 320 |
|                         |  | C >= 0,25 ... >= 0,55 % ricotto                  | 190             | 639                                | P2               | 170 - 180 - 190               | 150 - 175 - 200 | 180 - 235 - 290 |
|                         |  | C >= 0,25 ... >= 0,55 % bonificato               | 210             | 708                                | P3               | 170 - 180 - 190               | 150 - 175 - 200 | 180 - 235 - 290 |
|                         |  | C ≤ 0,55 % ricotto                               | 190             | 639                                | P4               | 100 - 120 - 140               | 80 - 115 - 150  | 150 - 200 - 250 |
|                         |  | C ≤ 0,55 % bonificato                            | 300             | 1013                               | P5               | 100 - 120 - 140               | 80 - 115 - 150  | 150 - 200 - 250 |
|                         | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                 | 220             | 745                                | P6               | 100 - 120 - 140               | 80 - 115 - 150  | 150 - 200 - 250 |
|                         |  | ricotto  | 175             | 591                                | P7               | 170 - 180 - 190               | 150 - 175 - 200 | 180 - 230 - 280 |
|                         |  | bonificato                                       | 300             | 1013                               | P8               | 90 - 120 - 150                | 80 - 120 - 160  | 170 - 210 - 250 |
|                         |  | bonificato                                       | 380             | 1282                               | P9               | 70 - 100 - 130                | 60 - 100 - 140  | 150 - 185 - 220 |
|                         | Acciai fortemente legati e acciai da utensili              | bonificato                                       | 430             | 1477                               | P10              | 70 - 100 - 130                | 60 - 100 - 140  | 150 - 185 - 220 |
|                         |  | ricotto  | 200             | 675                                | P11              | 120 - 160 - 200               | 110 - 140 - 170 | 80 - 120 - 160  |
|                         |  | temprato e rinvenuto                             | 300             | 1013                               | P12              | 50 - 75 - 100                 | 60 - 95 - 130   | 40 - 85 - 130   |
|                         | Acciai inossidabili  | temprato e rinvenuto                             | 400             | 1361                               | P13              | 50 - 75 - 100                 | 60 - 95 - 130   | 40 - 85 - 130   |
|                         |  | ferritico / martensitico, ricotto                | 200             | 675                                | P14              | 140 - 160 - 180               | 110 - 145 - 180 | 60 - 120 - 180  |
|                         |  | martensitico, bonificato                         | 330             | 1114                               | P15              | 110 - 135 - 160               | 90 - 125 - 160  | 40 - 90 - 140   |
| <b>M</b>                | Acciai inossidabili  | austenitico, trattato o temperato                | 200             | 675                                | M1               | 120 - 155 - 190               | 100 - 135 - 170 | 80 - 120 - 160  |
|                         |  | austenitico, indurimento per precipitazione (PH) | 300             | 1013                               | M2               | 80 - 115 - 150                | -               | 40 - 85 - 130   |
|                         |  | austenitico-ferritico, Duplex                    | 230             | 778                                | M3               | 80 - 115 - 150                | -               | 40 - 85 - 130   |
| <b>K</b>                | Ghisa temprata   | ferritico  | 200             | 675                                | K1               | -                             | -               | 150 - 180 - 210 |
|                         |  | perlitica  | 260             | 867                                | K2               | -                             | -               | 150 - 180 - 210 |
|                         | Ghisa grigia   | bassa resistenza                                 | 180             | 602                                | K3               | -                             | -               | 180 - 240 - 300 |
|                         |  | alta resistenza / austenitico                    | 245             | 825                                | K4               | -                             | -               | 120 - 180 - 240 |
|                         | Ghisa sferoidale   | ferritico  | 155             | 518                                | K5               | -                             | -               | 140 - 185 - 230 |
|                         |  | perlitica  | 265             | 885                                | K6               | -                             | -               | 120 - 145 - 170 |
|                         | GGV (CGI)  |  | 200             | 675                                | K7               | -                             | -               | 180 - 240 - 300 |
| <b>N</b>                | Leghe di Alluminio stampato                                | non invecchiato                                  | 30              | -                                  | N1               | -                             | -               | -               |
|                         |  | rinvenuto, invecchiato                           | 100             | 343                                | N2               | -                             | -               | -               |
|                         | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                       | 75              | 260                                | N3               | -                             | -               | -               |
|                         |  | ≤ 12 % Si, rinvenuto, invecchiato                | 90              | 314                                | N4               | -                             | -               | -               |
|                         | Leghe di magnesio  | > 12 % Si, non invecchiato                       | 130             | 447                                | N5               | -                             | -               | -               |
|                         |  | > 12 % Si, non invecchiato                       | 70              | 250                                | N6               | -                             | -               | -               |
|                         | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                   | 100             | 343                                | N7               | -                             | -               | 100 - 210 - 320 |
|                         |  | Ottone, Bronzo                                   | 90              | 314                                | N8               | -                             | -               | 200 - 350 - 500 |
|                         |  | Leghe Cu, truciolo corto                         | 110             | 382                                | N9               | -                             | -               | 200 - 350 - 500 |
|                         |  |  | 300             | 1013                               | N10              | -                             | -               | -               |
| Materiali non metallici | Leghe al piombo (senza materiale di riempimento abrasivo)  | -  | -               | N11                                | -                | -                             | 160 - 380 - 600 |                 |
|                         | Duroplastico (senza materiale di riempimento abrasivo)     | -  | -               | N12                                | -                | -                             | 160 - 380 - 600 |                 |
|                         | Plastica rinforzata in fibra di vetro GFRP                 | -  | -               | N13                                | -                | -                             | 100 - 200 - 300 |                 |
|                         | Plastica rinforzata in fibra di carbonio CFRP              | -  | -               | N14                                | -                | -                             | 100 - 200 - 300 |                 |
|                         | Plastica rinforzata in fibra aramidica AFRP                | -  | -               | N15                                | -                | -                             | 100 - 200 - 300 |                 |
|                         | Grafite (tecnico)  | 80 Shore   | -               | N16                                | -                | -                             | -               |                 |
| <b>S</b>                | Leghe resistenti al calore                                 | Base-Fe ricotto                                  | 200             | 675                                | S1               | 20 - 30 - 40                  | -               | 20 - 40 - 60    |
|                         |  | Base-Fe invecchiato                              | 280             | 943                                | S2               | 15 - 25 - 35                  | -               | 20 - 40 - 60    |
|                         |  | Base Ni o Co ricotto                             | 250             | 839                                | S3               | 8 - 15 - 25                   | -               | 15 - 35 - 50    |
|                         |  | Base Ni o Co invecchiato                         | 350             | 1177                               | S4               | 4 - 10 - 15                   | -               | 15 - 30 - 40    |
|                         |  | Base Ni o Co da fusione                          | 320             | 1076                               | S5               | 4 - 10 - 15                   | -               | 15 - 30 - 40    |
|                         | Leghe di Titanio   | Titanio puro                                     | 200             | 675                                | S6               | -                             | -               | 90 - 135 - 180  |
|                         |  | Leghe α e β, invecchiato                         | 375             | 1262                               | S7               | -                             | -               | 40 - 60 - 80    |
|                         |  | Leghe β  | 410             | 1396                               | S8               | -                             | -               | 40 - 60 - 80    |
|                         | Leghe di tungsteno   |  | 300             | 1013                               | S9               | -                             | -               | -               |
|                         | Leghe di molibdeno   |  | 300             | 1013                               | S10              | -                             | -               | -               |
| <b>H</b>                | Acciaio Temprato   | temprato e rinvenuto                             | 50 HRC          | -                                  | H1               | -                             | -               | 30 - 40 - 50    |
|                         |  | temprato e rinvenuto                             | 55 HRC          | -                                  | H2               | -                             | -               | 10 - 20 - 25    |
|                         |  | temprato e rinvenuto                             | 60 HRC          | -                                  | H3               | -                             | -               | 10 - 20 - 25    |
| Ghisa Temprata          | temprato e rinvenuto                                       | 55 HRC   | -               | H4                                 | -                | -                             | 10 - 20 - 25    |                 |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito



| Gruppo materiale | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                   |                   |
|------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|-------------------|-------------------|
|                  |  |   |                 |                                    |                  | HC                            |                   |                   |
|                  |  |   |                 |                                    |                  | AD2                           | AT10              | AT20              |
| <b>P</b>         | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | -                             | 220 - 270 - 320   | 180 - 230 - 280   |
|                  |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | -                             | 180 - 235 - 290   | 160 - 205 - 250   |
|                  |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | -                             | 180 - 235 - 290   | 160 - 205 - 250   |
|                  |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | -                             | 150 - 200 - 250   | 120 - 170 - 220   |
|                  |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | -                             | 150 - 200 - 250   | 120 - 170 - 220   |
|                  | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | -                             | 150 - 200 - 250   | 120 - 170 - 220   |
|                  |  | ricotto   | 175             | 591                                | P7               | -                             | 180 - 230 - 280   | 160 - 205 - 250   |
|                  |  | bonificato  | 300             | 1013                               | P8               | -                             | 170 - 210 - 250   | 140 - 185 - 230   |
|                  |  | bonificato  | 380             | 1282                               | P9               | -                             | 150 - 185 - 220   | 120 - 160 - 200   |
|                  | Acciai fortemente legati e acciai da utensili              | bonificato  | 430             | 1477                               | P10              | -                             | 150 - 185 - 220   | 120 - 160 - 200   |
|                  |  | ricotto   | 200             | 675                                | P11              | -                             | -                 | -                 |
|                  |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | -                             | -                 | -                 |
|                  | Acciai inossidabili  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | -                             | -                 | -                 |
|                  |  | ricotto   | 200             | 675                                | P14              | -                             | 170 - 230 - 290   | 160 - 220 - 280   |
|                  |  | martensitico, bonificato                                  | 330             | 1114                               | P15              | -                             | 140 - 210 - 280   | 130 - 205 - 280   |
| <b>M</b>         | Acciai inossidabili  | austenitico, trattato o temperato                         | 200             | 675                                | M1               | -                             | 140 - 210 - 280   | 140 - 190 - 240   |
|                  |  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | -                             | -                 | -                 |
|                  |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | -                             | -                 | -                 |
| <b>K</b>         | Ghisa temprata   | ferritico   | 200             | 675                                | K1               | -                             | 150 - 180 - 210   | 130 - 165 - 200   |
|                  |  | perlitica   | 260             | 867                                | K2               | -                             | 150 - 180 - 210   | 130 - 165 - 200   |
|                  | Ghisa grigia   | bassa resistenza  | 180             | 602                                | K3               | -                             | 180 - 240 - 300   | 160 - 215 - 270   |
|                  |  | alta resistenza / austenitico                             | 245             | 825                                | K4               | -                             | 120 - 180 - 240   | 110 - 165 - 220   |
|                  | Ghisa sferoidale   | ferritico   | 155             | 518                                | K5               | -                             | 140 - 185 - 230   | 130 - 170 - 210   |
|                  |  | perlitica   | 265             | 885                                | K6               | -                             | 120 - 145 - 170   | 110 - 130 - 150   |
|                  | GGV (CGI)  |   | 200             | 675                                | K7               | -                             | 180 - 240 - 300   | 160 - 215 - 270   |
| <b>N</b>         | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | 650 - 1325 - 2000             | 850 - 1075 - 1300 | 850 - 1075 - 1300 |
|                  |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | 300 - 1150 - 2000             | 400 - 650 - 900   | 400 - 650 - 900   |
|                  | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | 650 - 1325 - 2000             | 260 - 530 - 800   | 260 - 530 - 800   |
|                  |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | 300 - 1150 - 2000             | 200 - 375 - 550   | 200 - 375 - 550   |
|                  |  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | 200 - 1100 - 2000             | 200 - 350 - 500   | 200 - 350 - 500   |
|                  | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -                 | -                 |
|                  | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | 130 - 265 - 400               | -                 | -                 |
|                  |  | Ottone, Bronzo  | 90              | 314                                | N8               | 250 - 525 - 800               | -                 | -                 |
|                  |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | 250 - 525 - 800               | -                 | -                 |
|                  |  |   | 300             | 1013                               | N10              | -                             | -                 | -                 |
|                  | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | -                 | -                 |
|                  |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | -                 | -                 |
|                  |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | -                 | -                 |
|                  |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | -                 | -                 |
|                  |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | -                 | -                 |
|                  |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -                 | -                 |
| <b>S</b>         | Leghe resistenti al calore                                 | Base-Fe ricotto   | 200             | 675                                | S1               | -                             | 20 - 35 - 50      | 20 - 35 - 50      |
|                  |  | Base-Fe invecchiato                                       | 280             | 943                                | S2               | -                             | 20 - 35 - 50      | 20 - 35 - 50      |
|                  |  | Base Ni o Co ricotto                                      | 250             | 839                                | S3               | -                             | 15 - 30 - 40      | 15 - 30 - 40      |
|                  |  | Base Ni o Co invecchiato                                  | 350             | 1177                               | S4               | -                             | 15 - 25 - 30      | 15 - 25 - 30      |
|                  |  | Base Ni o Co da fusione                                   | 320             | 1076                               | S5               | -                             | 15 - 25 - 30      | 15 - 25 - 30      |
|                  | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | -                             | -                 | -                 |
|                  |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | -                 | -                 |
|                  |  | Leghe β   | 410             | 1396                               | S8               | -                             | -                 | -                 |
|                  | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -                 | -                 |
|                  | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -                 | -                 |
| <b>H</b>         | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -                 | -                 |
|                  |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -                 | -                 |
|                  |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -                 | -                 |
|                  | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -                 | -                 |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito



| Gruppo materiale                                       | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                   |                   |
|--|--|---|-----------------|------------------------------------|------------------|-------------------------------|-------------------|-------------------|
|  |  |   |                 |                                    |                  | HU                            |                   |                   |
|  |  |   |                 |                                    |                  | AK10                          | AK1010            | AK1020            |
| <b>P</b>   | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | -                             | -                 | -                 |
|  |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | -                             | -                 | -                 |
|  |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | -                             | -                 | -                 |
|  |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | -                             | -                 | -                 |
|  |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | -                             | -                 | -                 |
|  | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | -                             | -                 | -                 |
|  |  | ricotto   | 175             | 591                                | P7               | -                             | -                 | -                 |
|  |  | bonificato  | 300             | 1013                               | P8               | -                             | -                 | -                 |
|  |  | bonificato  | 380             | 1282                               | P9               | -                             | -                 | -                 |
|  |  | bonificato  | 430             | 1477                               | P10              | -                             | -                 | -                 |
|  | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | -                             | -                 | -                 |
|  |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | -                             | -                 | -                 |
|  |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | -                             | -                 | -                 |
|  | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | -                             | -                 | -                 |
|  |  | martensitico, bonificato                                  | 330             | 1114                               | P15              | -                             | -                 | -                 |
| austenitico, trattato o temperato                      |  | 200   | 675             | M1                                 | -                | -                             | -                 |                   |
| <b>M</b> Acciai inossidabili                           | austenitico, indurimento per precipitazione (PH)           | 300   | 1013            | M2                                 | -                | -                             | -                 |                   |
|  | austenitico-ferritico, Duplex                              | 230   | 778             | M3                                 | -                | -                             | -                 |                   |
|  | ferritico  | 200   | 675             | K1                                 | 140 - 170 - 200  | 140 - 170 - 200               | 140 - 170 - 200   |                   |
| <b>K</b> Ghisa temprata                                | perlitica  | 260   | 867             | K2                                 | 120 - 140 - 160  | 120 - 140 - 160               | 120 - 140 - 160   |                   |
|  | bassa resistenza   | 180   | 602             | K3                                 | 120 - 140 - 160  | 120 - 140 - 160               | 120 - 140 - 160   |                   |
|  | alta resistenza / austenitico                              | 245   | 825             | K4                                 | 80 - 110 - 140   | 80 - 110 - 140                | 80 - 110 - 140    |                   |
|  | ferritico  | 155   | 518             | K5                                 | 130 - 150 - 170  | 130 - 150 - 170               | 130 - 150 - 170   |                   |
|  | perlitica  | 265   | 885             | K6                                 | 90 - 110 - 130   | 90 - 110 - 130                | 90 - 110 - 130    |                   |
|  | GGV (CGI)  | 200   | 675             | K7                                 | 120 - 140 - 160  | 120 - 140 - 160               | 120 - 140 - 160   |                   |
| <b>N</b>   | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | 300 - 1400 - 2500             | 300 - 1400 - 2500 | 300 - 1400 - 2500 |
|  |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | 200 - 1100 - 2000             | 200 - 1100 - 2000 | 200 - 1100 - 2000 |
|  | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | 400 - 950 - 1500              | 400 - 950 - 1500  | 400 - 950 - 1500  |
|  |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | 400 - 950 - 1500              | 400 - 950 - 1500  | 400 - 950 - 1500  |
|  | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | 200 - 500 - 800               | 200 - 500 - 800   | 200 - 500 - 800   |
|  |  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -                 | -                 |
|  | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | 150 - 225 - 300               | 150 - 225 - 300   | 150 - 225 - 300   |
|  |  | Ottone, Bronzo  | 90              | 314                                | N8               | 200 - 400 - 600               | 200 - 400 - 600   | 200 - 400 - 600   |
|  |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | 250 - 425 - 600               | 250 - 425 - 600   | 250 - 425 - 600   |
|  |  |   | 300             | 1013                               | N10              | -                             | -                 | -                 |
|  |  |   |                 |                                    |                  |                               |                   |                   |
|  | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | 80 - 130 - 180                | 80 - 130 - 180    | 80 - 130 - 180    |
| Duroplastico (senza materiale di riempimento abrasivo) |  | -   | -               | N12                                | 80 - 130 - 180   | 80 - 130 - 180                | 80 - 130 - 180    |                   |
| Plastica rinforzata in fibra di vetro GFRP             |  | -   | -               | N13                                | 60 - 105 - 150   | 60 - 105 - 150                | 60 - 105 - 150    |                   |
| Plastica rinforzata in fibra di carbonio CFRP          |  | -   | -               | N14                                | 60 - 105 - 150   | 60 - 105 - 150                | 60 - 105 - 150    |                   |
| Plastica rinforzata in fibra aramidica AFRP            |  | -   | -               | N15                                | 60 - 105 - 150   | 60 - 105 - 150                | 60 - 105 - 150    |                   |
| Grafite (tecnico)                                      |  | 80 Shore  | -               | N16                                | -                | -                             | -                 |                   |
| <b>S</b>   | Leghe resistenti al calore                                 | Base-Fe ricotto   | 200             | 675                                | S1               | 15 - 30 - 40                  | 15 - 30 - 40      | -                 |
|  |  | Base-Fe invecchiato                                       | 280             | 943                                | S2               | 8 - 20 - 28                   | 8 - 20 - 28       | -                 |
|  |  | Base Ni o Co ricotto                                      | 250             | 839                                | S3               | 10 - 20 - 30                  | 10 - 20 - 30      | -                 |
|  |  | Base Ni o Co invecchiato                                  | 350             | 1177                               | S4               | 8 - 15 - 25                   | 8 - 15 - 25       | -                 |
|  |  | Base Ni o Co da fusione                                   | 320             | 1076                               | S5               | 8 - 15 - 25                   | 8 - 15 - 25       | -                 |
|  | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | 60 - 90 - 120                 | 60 - 90 - 120     | 60 - 90 - 120     |
|  |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | 30 - 55 - 80                  | 30 - 55 - 80      | 30 - 55 - 80      |
|  |  | Leghe β   | 410             | 1396                               | S8               | 30 - 55 - 80                  | 30 - 55 - 80      | 30 - 55 - 80      |
|  | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -                 | -                 |
|  | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -                 | -                 |
| <b>H</b>   | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -                 | -                 |
|  |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -                 | -                 |
|  | Ghisa Temprata   | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -                 | -                 |
|  |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -                 | -                 |

I dati indicati in tabella sono valori approssimati.  
Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito  
HU = Metallo duro non rivestito





| Gruppo materiale                       | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                 |
|--|--|---|-----------------|------------------------------------|------------------|-------------------------------|-----------------|
|  |  |   |                 |                                    |                  | CC                            |                 |
|  |  |   |                 |                                    |                  | AP6510                        | AC90C           |
| <b>P</b>                               | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | 300 - 350 - 400               | 220 - 270 - 320 |
|  |  | C > 0,25 ... >= 0,55 % ricotto                            | 190             | 639                                | P2               | 260 - 305 - 350               | 180 - 235 - 290 |
|  |  | C > 0,25 ... >= 0,55 % bonificato                         | 210             | 708                                | P3               | 260 - 305 - 350               | 180 - 235 - 290 |
|  |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | 240 - 270 - 300               | 150 - 200 - 250 |
|  |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | 240 - 270 - 300               | 150 - 200 - 250 |
|  | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | 240 - 270 - 300               | 150 - 200 - 250 |
|  |  | ricotto   | 175             | 591                                | P7               | 220 - 260 - 300               | 180 - 220 - 260 |
|  |  | bonificato  | 300             | 1013                               | P8               | 180 - 220 - 260               | 150 - 185 - 220 |
|  |  | bonificato  | 380             | 1282                               | P9               | 120 - 170 - 220               | 80 - 135 - 190  |
|  |  | bonificato  | 430             | 1477                               | P10              | 120 - 170 - 220               | 80 - 135 - 190  |
|  | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | 150 - 185 - 220               | 80 - 115 - 150  |
|  |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | 70 - 110 - 150                | 40 - 85 - 130   |
|  |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | 70 - 110 - 150                | 40 - 85 - 130   |
|  | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | -                             | 40 - 95 - 150   |
|  |  | martensitico, bonificato                                  | 330             | 1114                               | P15              | -                             | 40 - 90 - 140   |
| austenitico, trattato o temperato      |  | 200   | 675             | M1                                 | -                | 80 - 120 - 160                |                 |
| <b>M</b>                               | Acciai inossidabili  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | -                             | 40 - 85 - 130   |
|  |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | -                             | 40 - 85 - 130   |
|  |  | ferritico   | 200             | 675                                | K1               | -                             | 150 - 180 - 210 |
| <b>K</b>                               | Ghisa temprata   | perlitica   | 260             | 867                                | K2               | -                             | 150 - 180 - 210 |
|  |  | bassa resistenza  | 180             | 602                                | K3               | -                             | 180 - 240 - 300 |
|  | Ghisa grigia   | alta resistenza / austenitico                             | 245             | 825                                | K4               | -                             | 120 - 180 - 240 |
|  |  | ferritico   | 155             | 518                                | K5               | -                             | 140 - 185 - 230 |
|  | Ghisa sferoidale   | perlitica   | 265             | 885                                | K6               | -                             | 120 - 145 - 170 |
|  |  | GGV (CGI)   | 200             | 675                                | K7               | -                             | 180 - 240 - 300 |
|  | <b>N</b>   | Leghe di Alluminio stampato                               | non invecchiato | 30                                 | -                | N1                            | -               |
| rinvenuto, invecchiato                 |  |   | 100             | 343                                | N2               | -                             | -               |
| Leghe di Alluminio da fusione          |  | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | -                             | -               |
|  |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | -                             | -               |
|  |  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | -                             | -               |
| Leghe di magnesio                      |  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -               |
|  |  | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | -                             | 120 - 160 - 200 |
| Rame e Leghe di Rame (Bronzo / Ottone) |  | Ottone, Bronzo  | 90              | 314                                | N8               | -                             | 200 - 350 - 500 |
|  |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | -                             | 200 - 350 - 500 |
|  |  |   | 300             | 1013                               | N10              | -                             | -               |
|  |  | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | 160 - 380 - 600 |
| Materiali non metallici                |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | 160 - 380 - 600 |
|  |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | 100 - 200 - 300 |
|  |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | 100 - 200 - 300 |
|  |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | 100 - 200 - 300 |
|  |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -               |
|  | <b>S</b>   | Leghe resistenti al calore                                | Base-Fe ricotto | 200                                | 675              | S1                            | -               |
| Base-Fe invecchiato                    |  |   | 280             | 943                                | S2               | -                             | 20 - 40 - 60    |
| Base Ni o Co ricotto                   |  |   | 250             | 839                                | S3               | -                             | 15 - 35 - 50    |
| Base Ni o Co invecchiato               |  |   | 350             | 1177                               | S4               | -                             | 15 - 30 - 40    |
| Base Ni o Co da fusione                |  |   | 320             | 1076                               | S5               | -                             | 15 - 30 - 40    |
| Leghe di Titanio                       |  | Titanio puro  | 200             | 675                                | S6               | -                             | 90 - 135 - 180  |
|  |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | 40 - 60 - 80    |
|  |  | Leghe β   | 410             | 1396                               | S8               | -                             | 40 - 60 - 80    |
| Leghe di tungsteno                     |  |   | 300             | 1013                               | S9               | -                             | -               |
| Leghe di molibdeno                     |  |   | 300             | 1013                               | S10              | -                             | -               |
| <b>H</b>                               | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | 30 - 40 - 50    |
|  |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | 10 - 20 - 25    |
|  |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | 10 - 20 - 25    |
|  | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | 10 - 20 - 25    |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

CC = Cermet rivestito

| Gruppo materiale                  | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                 |
|-----------------------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|-----------------|
|                                   |  |   |                 |                                    |                  | CU                            |                 |
|                                   |  |   |                 |                                    |                  | ACE6                          | AP6010          |
| <b>P</b>                          | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | 100 - 250 - 400               | 100 - 275 - 450 |
|                                   |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | 80 - 225 - 370                | 80 - 265 - 450  |
|                                   |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | 80 - 225 - 370                | 80 - 265 - 450  |
|                                   |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | 50 - 200 - 350                | 50 - 200 - 350  |
|                                   |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | 50 - 200 - 350                | 50 - 200 - 350  |
|                                   | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | 50 - 200 - 350                | 50 - 200 - 350  |
|                                   |  | ricotto   | 175             | 591                                | P7               | 80 - 190 - 300                | 80 - 265 - 450  |
|                                   |  | bonificato  | 300             | 1013                               | P8               | 70 - 170 - 270                | 70 - 260 - 450  |
|                                   |  | bonificato  | 380             | 1282                               | P9               | 50 - 150 - 250                | 50 - 200 - 350  |
|                                   |  | bonificato  | 430             | 1477                               | P10              | 50 - 150 - 250                | 50 - 200 - 350  |
|                                   | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | 80 - 140 - 200                | 60 - 155 - 250  |
|                                   |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | 50 - 105 - 160                | 50 - 115 - 180  |
|                                   |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | 50 - 105 - 160                | 50 - 115 - 180  |
|                                   | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | 80 - 165 - 250                | 80 - 190 - 300  |
|                                   |  | martensitico, bonificato                                  | 330             | 1114                               | P15              | 80 - 165 - 250                | 80 - 215 - 350  |
| austenitico, trattato o temperato |  | 200   | 675             | M1                                 | 80 - 160 - 240   | 80 - 190 - 300                |                 |
| <b>M</b> Acciai inossidabili      | austenitico, indurimento per precipitazione (PH)           | 300   | 1013            | M2                                 | 80 - 160 - 240   | 60 - 180 - 300                |                 |
|                                   | austenitico-ferritico, Duplex                              | 230   | 778             | M3                                 | 80 - 160 - 240   | 60 - 180 - 300                |                 |
|                                   | ferritico  | 200   | 675             | K1                                 | 80 - 215 - 350   | 100 - 200 - 300               |                 |
| <b>K</b> Ghisa temprata           | perlitica  | 260   | 867             | K2                                 | 60 - 155 - 250   | 100 - 200 - 300               |                 |
|                                   | bassa resistenza   | 180   | 602             | K3                                 | 80 - 190 - 300   | 100 - 200 - 300               |                 |
|                                   | alta resistenza / austenitico                              | 245   | 825             | K4                                 | 80 - 160 - 240   | 100 - 200 - 300               |                 |
| Ghisa sferoidale                  | ferritico  | 155   | 518             | K5                                 | 80 - 190 - 300   | 100 - 200 - 300               |                 |
|                                   | perlitica  | 265   | 885             | K6                                 | 80 - 165 - 250   | 100 - 200 - 300               |                 |
| GGV (CGI)                         |  | 200   | 675             | K7                                 | 80 - 190 - 300   | 100 - 200 - 300               |                 |
| <b>N</b>                          | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | -                             | -               |
|                                   |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | -                             | -               |
|                                   |  | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | -                             | -               |
|                                   | Leghe di Alluminio da fusione                              | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | -                             | -               |
|                                   |  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | -                             | -               |
|                                   | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -               |
|                                   |  | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | -                             | -               |
|                                   | Rame e Leghe di Rame (Bronzo / Ottone)                     | Ottone, Bronzo  | 90              | 314                                | N8               | -                             | -               |
|                                   |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | -                             | -               |
|                                   |  |   | 300             | 1013                               | N10              | -                             | -               |
|                                   |  | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | -               |
|                                   | Materiali non metallici                                    | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | -               |
|                                   |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | -               |
|                                   |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | -               |
|                                   |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | -               |
|                                   |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -               |
| <b>S</b>                          |  | Leghe resistenti al calore                                | Base-Fe ricotto | 200                                | 675              | S1                            | -               |
|                                   | Base-Fe invecchiato  |   | 280             | 943                                | S2               | -                             | -               |
|                                   | Base Ni o Co ricotto                                       |   | 250             | 839                                | S3               | -                             | -               |
|                                   | Base Ni o Co invecchiato                                   |   | 350             | 1177                               | S4               | -                             | -               |
|                                   | Base Ni o Co da fusione                                    |   | 320             | 1076                               | S5               | -                             | -               |
|                                   | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | -                             | -               |
|                                   |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | -               |
|                                   |  | Leghe β   | 410             | 1396                               | S8               | -                             | -               |
|                                   | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -               |
|                                   | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -               |
| <b>H</b>                          | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -               |
|                                   |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -               |
|                                   | Ghisa Temprata   | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -               |
|                                   |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -               |

I dati indicati in tabella sono valori approssimati.  
Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito  
HU = Metallo duro non rivestito

4

| Gruppo materiale                  | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                   |                   |
|-----------------------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|-------------------|-------------------|
|                                   |  |   |                 |                                    |                  | HU                            |                   |                   |
|                                   |  |   |                 |                                    |                  | AM350                         | AK1020            | AK10              |
| <b>P</b>                          | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | 180 - 205 - 230               | -                 | -                 |
|                                   |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | 170 - 180 - 190               | -                 | -                 |
|                                   |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | 170 - 180 - 190               | -                 | -                 |
|                                   |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | 100 - 120 - 140               | -                 | -                 |
|                                   |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | 100 - 120 - 140               | -                 | -                 |
|                                   |  | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | 100 - 120 - 140               | -                 | -                 |
|                                   | Acciai debolmente legati                                   | ricotto   | 175             | 591                                | P7               | 170 - 180 - 190               | -                 | -                 |
|                                   |  | bonificato  | 300             | 1013                               | P8               | 90 - 120 - 150                | -                 | -                 |
|                                   |  | bonificato  | 380             | 1282                               | P9               | 70 - 100 - 130                | -                 | -                 |
|                                   |  | bonificato  | 430             | 1477                               | P10              | 70 - 100 - 130                | -                 | -                 |
|                                   | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | 120 - 160 - 200               | -                 | -                 |
|                                   |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | 50 - 75 - 100                 | -                 | -                 |
|                                   |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | 50 - 75 - 100                 | -                 | -                 |
|                                   | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | 140 - 160 - 180               | -                 | -                 |
|                                   |  | martensitico, bonificato                                  | 330             | 1114                               | P15              | 110 - 135 - 160               | -                 | -                 |
| austenitico, trattato o temperato |  | 200   | 675             | M1                                 | 120 - 155 - 190  | -                             | -                 |                   |
| <b>M</b>                          | Acciai inossidabili  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | 80 - 115 - 150                | -                 | -                 |
|                                   |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | 80 - 115 - 150                | -                 | -                 |
|                                   |  | ferritico   | 200             | 675                                | K1               | -                             | 140 - 170 - 200   | 140 - 170 - 200   |
| <b>K</b>                          | Ghisa temprata   | perlitica   | 260             | 867                                | K2               | -                             | 120 - 140 - 160   | 120 - 140 - 160   |
|                                   |  | bassa resistenza  | 180             | 602                                | K3               | -                             | 120 - 140 - 160   | 120 - 140 - 160   |
|                                   | Ghisa grigia   | alta resistenza / austenitico                             | 245             | 825                                | K4               | -                             | 80 - 110 - 140    | 80 - 110 - 140    |
|                                   |  | ferritico   | 155             | 518                                | K5               | -                             | 130 - 150 - 170   | 130 - 150 - 170   |
|                                   | Ghisa sferoidale   | perlitica   | 265             | 885                                | K6               | -                             | 90 - 110 - 130    | 90 - 110 - 130    |
| GGV (CGI)                         |  | 200   | 675             | K7                                 | -                | 120 - 140 - 160               | 120 - 140 - 160   |                   |
| <b>N</b>                          | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | -                             | 300 - 1400 - 2500 | 300 - 1400 - 2500 |
|                                   |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | -                             | 200 - 1100 - 2000 | 200 - 1100 - 2000 |
|                                   |  | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | -                             | 400 - 950 - 1500  | 400 - 950 - 1500  |
|                                   | Leghe di Alluminio da fusione                              | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | -                             | 400 - 950 - 1500  | 400 - 950 - 1500  |
|                                   |  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | -                             | 200 - 500 - 800   | 200 - 500 - 800   |
|                                   | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -                 | -                 |
|                                   | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | -                             | 150 - 225 - 300   | 150 - 225 - 300   |
|                                   |  | Ottone, Bronzo  | 90              | 314                                | N8               | -                             | 200 - 400 - 600   | 200 - 400 - 600   |
|                                   |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | -                             | 250 - 425 - 600   | 250 - 425 - 600   |
|                                   |  |   | 300             | 1013                               | N10              | -                             | -                 | -                 |
|                                   | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | 80 - 130 - 180    | 80 - 130 - 180    |
|                                   |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | 80 - 130 - 180    | 80 - 130 - 180    |
|                                   |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | 60 - 105 - 150    | 60 - 105 - 150    |
|                                   |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | 60 - 105 - 150    | 60 - 105 - 150    |
|                                   |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | 60 - 105 - 150    | 60 - 105 - 150    |
| Grafite (tecnico)                 |  | 80 Shore  | -               | N16                                | -                | -                             | -                 |                   |
| <b>S</b>                          | Leghe resistenti al calore                                 | Base-Fe ricotto   | 200             | 675                                | S1               | 20 - 30 - 40                  | -                 | 15 - 30 - 40      |
|                                   |  | Base-Fe invecchiato                                       | 280             | 943                                | S2               | 15 - 25 - 35                  | -                 | 8 - 20 - 28       |
|                                   |  | Base Ni o Co ricotto                                      | 250             | 839                                | S3               | 8 - 15 - 25                   | -                 | 10 - 20 - 30      |
|                                   |  | Base Ni o Co invecchiato                                  | 350             | 1177                               | S4               | 4 - 10 - 15                   | -                 | 8 - 15 - 25       |
|                                   |  | Base Ni o Co da fusione                                   | 320             | 1076                               | S5               | 4 - 10 - 15                   | -                 | 8 - 15 - 25       |
|                                   | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | -                             | 60 - 90 - 120     | 60 - 90 - 120     |
|                                   |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | 30 - 55 - 80      | 30 - 55 - 80      |
|                                   |  | Leghe β   | 410             | 1396                               | S8               | -                             | 30 - 55 - 80      | 30 - 55 - 80      |
|                                   | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -                 | -                 |
|                                   | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -                 | -                 |
| <b>H</b>                          | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -                 | -                 |
|                                   |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -                 | -                 |
|                                   |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -                 | -                 |
|                                   | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -                 | -                 |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

CC = Cermet rivestito

|  |                 |                 |        | HC              |
|--|-----------------|-----------------|--------|-----------------|
|  | AM5120          | AM5220          | AM5015 | AM2030          |
|  | 220 - 270 - 320 | 180 - 230 - 280 | -      | 170 - 195 - 220 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 180 - 220 - 260 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 185 - 220 | 140 - 185 - 230 | -      | 80 - 110 - 140  |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 115 - 150  | 70 - 110 - 150  | -      | 110 - 150 - 190 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 95 - 150   | 50 - 105 - 160  | -      | 130 - 150 - 170 |
|  | 40 - 90 - 140   | 40 - 90 - 140   | -      | 100 - 125 - 150 |
|  | 80 - 120 - 160  | 70 - 110 - 150  | -      | 100 - 140 - 180 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | 120 - 180 - 240 | 120 - 180 - 240 | -      | -               |
|  | 140 - 185 - 230 | 140 - 185 - 230 | -      | -               |
|  | 120 - 145 - 170 | 120 - 145 - 170 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 120 - 160 - 200 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 20 - 30 - 40    |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 15 - 25 - 35    |
|  | 15 - 35 - 50    | 15 - 35 - 50    | -      | 8 - 15 - 25     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 90 - 135 - 180  | -               | -      | 80 - 105 - 130  |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 30 - 40 - 50    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |

| Groupe de matériaux                            | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |                 |
|--|--|---|----------------|------------------------------------|-------------------|-----------------------------|-----------------|-----------------|
|  |  |   |                |                                    |                   | HC                          |                 |                 |
|  |  |   |                |                                    |                   | AL10                        | AL20            | AP2025          |
| P  | Acier non allié  | C ≤ 0,25 % recuit                               | 125            | 428                                | P1                | 220 - 270 - 320             | 180 - 230 - 280 | 190 - 215 - 240 |
|  |  | C >= 0,25 ... >= 0,55 % recuit                  | 190            | 639                                | P2                | 180 - 235 - 290             | 160 - 205 - 250 | 170 - 185 - 200 |
|  |  | C >= 0,25 ... >= 0,55 % traité                  | 210            | 708                                | P3                | 180 - 235 - 290             | 160 - 205 - 250 | 170 - 185 - 200 |
|  |  | C ≤ 0,55 % recuit                               | 190            | 639                                | P4                | 150 - 200 - 250             | 120 - 170 - 220 | 130 - 145 - 160 |
|  |  | C ≤ 0,55 % traité                               | 300            | 1013                               | P5                | 150 - 200 - 250             | 120 - 170 - 220 | 130 - 145 - 160 |
|  |  | Aciers de décolletage (à copeaux courts) recuit | 220            | 745                                | P6                | 150 - 200 - 250             | 120 - 170 - 220 | 130 - 145 - 160 |
|  | Acier faiblement allié   | recuit  | 175            | 591                                | P7                | 180 - 230 - 280             | 160 - 205 - 250 | 170 - 185 - 200 |
|  |  | traité  | 300            | 1013                               | P8                | 170 - 210 - 250             | 140 - 185 - 230 | 100 - 130 - 160 |
|  |  | traité  | 380            | 1282                               | P9                | 150 - 185 - 220             | 120 - 160 - 200 | 80 - 110 - 140  |
|  |  | traité  | 430            | 1477                               | P10               | 150 - 185 - 220             | 120 - 160 - 200 | 80 - 110 - 140  |
|  | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | -                           | -               | 130 - 150 - 170 |
|  |  | trempe et revenu                                | 300            | 1013                               | P12               | -                           | -               | 80 - 105 - 130  |
|  |  | trempe et revenu                                | 400            | 1361                               | P13               | -                           | -               | 80 - 105 - 130  |
| Acier inox                                     | ferritique, martensitique, recuit                              | 200   | 675            | P14                                | 170 - 230 - 290   | 160 - 220 - 280             | 130 - 155 - 180 |                 |
|  | martensitique, traité  | 330   | 1114           | P15                                | 140 - 210 - 280   | 130 - 205 - 280             | 110 - 135 - 160 |                 |
| M  | Acier inox   | austénitique                                    | 200            | 675                                | M1                | 140 - 210 - 280             | 140 - 190 - 240 | 100 - 135 - 170 |
|  |  | austénitique                                    | 300            | 1013                               | M2                | -                           | -               | -               |
|  |  | austénitique-ferritique, Duplex                 | 230            | 778                                | M3                | -                           | -               | -               |
|  |  | ferritique                                      | 200            | 675                                | K1                | 150 - 180 - 210             | 130 - 165 - 200 | 150 - 190 - 230 |
| K  | Fonte malléable  | perlitique                                      | 260            | 867                                | K2                | 150 - 180 - 210             | 130 - 165 - 200 | 120 - 145 - 170 |
|  |  | faible résistance                               | 180            | 602                                | K3                | 180 - 240 - 300             | 160 - 215 - 270 | 130 - 165 - 200 |
|  | Fonte grise  | haute résistance / austénitique                 | 245            | 825                                | K4                | 120 - 180 - 240             | 110 - 165 - 220 | -               |
|  |  | ferritique                                      | 155            | 518                                | K5                | 140 - 185 - 230             | 130 - 170 - 210 | 120 - 145 - 170 |
| N  | Fonte à Graphite sphéroïdale                                   | perlitique                                      | 265            | 885                                | K6                | 120 - 145 - 170             | 110 - 130 - 150 | 120 - 155 - 190 |
|  |  | GGV (CGI)                                       | 200            | 675                                | K7                | 180 - 240 - 300             | 160 - 215 - 270 | 130 - 165 - 200 |
|  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30             | -                                  | N1                | -                           | -               | -               |
|  |  | pouvant subir un durcissement, durci            | 100            | 343                                | N2                | -                           | -               | -               |
|  |  | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75             | 260                                | N3                | -                           | -               | -               |
|  |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90             | 314                                | N4                | -                           | -               | -               |
|  |  | > 12 % Si, ne pouvant pas subir de durcissement | 130            | 447                                | N5                | -                           | -               | -               |
|  | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70             | 250                                | N6                | -                           | -               | -               |
|  |  | non allié, cuivre électrolytique                | 100            | 343                                | N7                | -                           | -               | -               |
|  | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                     | 90             | 314                                | N8                | -                           | -               | -               |
| Alliage de cuivre à copeaux courts             |  | 110   | 382            | N9                                 | -                 | -                           | -               |                 |
| forte résistance, Ampco                        |  | 300   | 1013           | N10                                | -                 | -                           | -               |                 |
| Thermoplaste (sans agents de charge abrasives) |  | -   | -              | N11                                | -                 | -                           | -               |                 |
| Matériaux non métalliques                      | Duroplaste (sans agents de charge abrasives)                   | -   | -              | N12                                | -                 | -                           | -               |                 |
|  | Matière plastique renforcée de fibres de verre GFRP            | -   | -              | N13                                | -                 | -                           | -               |                 |
|  | Matière plastique renforcé composite CFRP                      | -   | -              | N14                                | -                 | -                           | -               |                 |
|  | Plastique renforcé fibre aramide AFRP                          | -   | -              | N15                                | -                 | -                           | -               |                 |
|  | Graphite   | 80 Shore  | -              | N16                                | -                 | -                           | -               |                 |
| S  | Alliages réfractaires  | à base de Fe recuit                             | 200            | 675                                | S1                | 20 - 35 - 50                | 20 - 35 - 50    | 20 - 30 - 40    |
|  |  | à base de Fe durci                              | 280            | 943                                | S2                | 20 - 35 - 50                | 20 - 35 - 50    | 15 - 25 - 35    |
|  |  | à base Ni ou Co recuit                          | 250            | 839                                | S3                | 15 - 30 - 40                | 15 - 30 - 40    | 10 - 20 - 30    |
|  |  | à base Ni ou Co durci                           | 350            | 1177                               | S4                | 15 - 25 - 30                | 15 - 25 - 30    | 4 - 10 - 15     |
|  |  | à base Ni ou Co jeté                            | 320            | 1076                               | S5                | 15 - 25 - 30                | 15 - 25 - 30    | 4 - 10 - 15     |
|  | Alliage de titane  | Titane pur                                      | 200            | 675                                | S6                | -                           | -               | 80 - 105 - 130  |
|  |  | Alliages Alpha + Beta, trempé                   | 375            | 1262                               | S7                | -                           | -               | 20 - 30 - 40    |
|  |  | Alliages Beta                                   | 410            | 1396                               | S8                | -                           | -               | 20 - 30 - 40    |
|  | Alliage de tungstène   | 300   | 1013           | S9                                 | -                 | -                           | -               |                 |
|  | Alliage de molybdène   | 300   | 1013           | S10                                | -                 | -                           | -               |                 |
| H  | Acier trempé   | trempe et revenu                                | 50 HRC         | -                                  | H1                | -                           | -               | -               |
|  |  | trempe et revenu                                | 55 HRC         | -                                  | H2                | -                           | -               | -               |
|  |  | trempe et revenu                                | 60 HRC         | -                                  | H3                | -                           | -               | -               |
|  | Fonte durci  | trempe et revenu                                | 55 HRC         | -                                  | H4                | -                           | -               | -               |

Les données affichées dans le tableau sont des valeurs approximatives. Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carburé avec revêtement  
 CC = Cermet avec revêtement  
 CU = Cermet sans revêtement



| Groupe de matériaux                                 | Structure des groupes de matériaux et des lettres de référence | Dureté Brinell                                  | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |                 |                 |
|---|--|---|------------------------------------|-------------------|-----------------------------|-----------------|-----------------|-----------------|
|   |  |   |                                    |                   | HC                          |                 |                 |                 |
|   |  |   |                                    |                   | AM350                       | AM35C           | AM5015          |                 |
| <b>P</b>  | Acier non allié  | C ≤ 0,25 % recuit                               | 125                                | 428               | P1                          | 180 - 205 - 230 | 170 - 205 - 240 | 220 - 270 - 320 |
|   |  | C >= 0,25 ... >= 0,55 % recuit                  | 190                                | 639               | P2                          | 170 - 180 - 190 | 150 - 175 - 200 | 180 - 235 - 290 |
|   |  | C >= 0,25 ... >= 0,55 % traité                  | 210                                | 708               | P3                          | 170 - 180 - 190 | 150 - 175 - 200 | 180 - 235 - 290 |
|   |  | C ≤ 0,55 % recuit                               | 190                                | 639               | P4                          | 100 - 120 - 140 | 80 - 115 - 150  | 150 - 200 - 250 |
|   |  | C ≤ 0,55 % traité                               | 300                                | 1013              | P5                          | 100 - 120 - 140 | 80 - 115 - 150  | 150 - 200 - 250 |
|   | Acier faiblement allié   | Aciers de décolletage (à copeaux courts) recuit | 220                                | 745               | P6                          | 100 - 120 - 140 | 80 - 115 - 150  | 150 - 200 - 250 |
|   |  | recuit  | 175                                | 591               | P7                          | 170 - 180 - 190 | 150 - 175 - 200 | 180 - 230 - 280 |
|   |  | traité  | 300                                | 1013              | P8                          | 90 - 120 - 150  | 80 - 120 - 160  | 170 - 210 - 250 |
|   |  | traité  | 380                                | 1282              | P9                          | 70 - 100 - 130  | 60 - 100 - 140  | 150 - 185 - 220 |
|   |  | traité  | 430                                | 1477              | P10                         | 70 - 100 - 130  | 60 - 100 - 140  | 150 - 185 - 220 |
| Acier allié et acier outil allié                    | recuit   | 200   | 675                                | P11               | 120 - 160 - 200             | 110 - 140 - 170 | 80 - 120 - 160  |                 |
|   | trempe et revenu   | 300   | 1013                               | P12               | 50 - 75 - 100               | 60 - 95 - 130   | 40 - 85 - 130   |                 |
|   | trempe et revenu   | 400   | 1361                               | P13               | 50 - 75 - 100               | 60 - 95 - 130   | 40 - 85 - 130   |                 |
| Acier inox  | ferritique, martensitique, recuit                              | 200   | 675                                | P14               | 140 - 160 - 180             | 110 - 145 - 180 | 60 - 120 - 180  |                 |
|   | martensitique, traité  | 330   | 1114                               | P15               | 110 - 135 - 160             | 90 - 125 - 160  | 40 - 90 - 140   |                 |
| <b>M</b>  | Acier inox   | austénitique                                    | 200                                | 675               | M1                          | 120 - 155 - 190 | 100 - 135 - 170 | 80 - 120 - 160  |
|   |  | austénitique                                    | 300                                | 1013              | M2                          | 80 - 115 - 150  | -               | 40 - 85 - 130   |
|   |  | austénitique-ferritique, Duplex                 | 230                                | 778               | M3                          | 80 - 115 - 150  | -               | 40 - 85 - 130   |
| <b>K</b>  | Fonte malléable  | ferritique                                      | 200                                | 675               | K1                          | -               | -               | 150 - 180 - 210 |
|   |  | perlitique                                      | 260                                | 867               | K2                          | -               | -               | 150 - 180 - 210 |
|   | Fonte grise  | faible résistance                               | 180                                | 602               | K3                          | -               | -               | 180 - 240 - 300 |
|   |  | haute résistance / austénitique                 | 245                                | 825               | K4                          | -               | -               | 120 - 180 - 240 |
|   | Fonte à Graphite sphéroïdale                                   | ferritique                                      | 155                                | 518               | K5                          | -               | -               | 140 - 185 - 230 |
|   |  | perlitique                                      | 265                                | 885               | K6                          | -               | -               | 120 - 145 - 170 |
| GGV (CGI)   |  | 200   | 675                                | K7                | -                           | -               | 180 - 240 - 300 |                 |
| <b>N</b>  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30                                 | -                 | N1                          | -               | -               | -               |
|   |  | pouvant subir un durcissement, durci            | 100                                | 343               | N2                          | -               | -               | -               |
|   | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75                                 | 260               | N3                          | -               | -               | -               |
|   |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90                                 | 314               | N4                          | -               | -               | -               |
|   |  | > 12 % Si, ne pouvant pas subir de durcissement | 130                                | 447               | N5                          | -               | -               | -               |
|   | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70                                 | 250               | N6                          | -               | -               | -               |
|   |  | non allié, cuivre électrolytique                | 100                                | 343               | N7                          | -               | -               | 100 - 210 - 320 |
|   | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                     | 90                                 | 314               | N8                          | -               | -               | 200 - 350 - 500 |
|   |  | Alliage de cuivre à copeaux courts              | 110                                | 382               | N9                          | -               | -               | 200 - 350 - 500 |
|   | Matériaux non métalliques                                      | forte résistance, Ampco                         | 300                                | 1013              | N10                         | -               | -               | -               |
| Thermoplaste (sans agents de charge abrasives)      |  | -   | -                                  | N11               | -                           | -               | 160 - 380 - 600 |                 |
| Duroplaste (sans agents de charge abrasives)        |  | -   | -                                  | N12               | -                           | -               | 160 - 380 - 600 |                 |
| Matière plastique renforcée de fibres de verre GFRP |  | -   | -                                  | N13               | -                           | -               | 100 - 200 - 300 |                 |
| Matière plastique renforcé composite CFRP           |  | -   | -                                  | N14               | -                           | -               | 100 - 200 - 300 |                 |
| Plastique renforcé fibre aramide AFRP               |  | -   | -                                  | N15               | -                           | -               | 100 - 200 - 300 |                 |
| <b>S</b>  | Alliages réfractaires  | Graphite  | 80 Shore                           | -                 | N16                         | -               | -               | -               |
|   |  | à base de Fe recuit                             | 200                                | 675               | S1                          | 20 - 30 - 40    | -               | 20 - 40 - 60    |
|   |  | à base de Fe durci                              | 280                                | 943               | S2                          | 15 - 25 - 35    | -               | 20 - 40 - 60    |
|   |  | à base Ni ou Co recuit                          | 250                                | 839               | S3                          | 8 - 15 - 25     | -               | 15 - 35 - 50    |
|   |  | à base Ni ou Co durci                           | 350                                | 1177              | S4                          | 4 - 10 - 15     | -               | 15 - 30 - 40    |
|   | Alliage de titane  | à base Ni ou Co jeter                           | 320                                | 1076              | S5                          | 4 - 10 - 15     | -               | 15 - 30 - 40    |
|   |  | Titane pur                                      | 200                                | 675               | S6                          | -               | -               | 90 - 135 - 180  |
|   |  | Alliages Alpha + Beta, trempé                   | 375                                | 1262              | S7                          | -               | -               | 40 - 60 - 80    |
|   |  | Alliages Beta                                   | 410                                | 1396              | S8                          | -               | -               | 40 - 60 - 80    |
|   |  | Alliage de tungstène                            | 300                                | 1013              | S9                          | -               | -               | -               |
| Alliage de molybdène                                | 300  | 1013  | S10                                | -                 | -                           | -               |                 |                 |
| <b>H</b>  | Acier trempé   | trempe et revenu                                | 50 HRC                             | -                 | H1                          | -               | -               | 30 - 40 - 50    |
|   |  | trempe et revenu                                | 55 HRC                             | -                 | H2                          | -               | -               | 10 - 20 - 25    |
|   |  | trempe et revenu                                | 60 HRC                             | -                 | H3                          | -               | -               | 10 - 20 - 25    |
|   | Fonte durci  | trempe et revenu                                | 55 HRC                             | -                 | H4                          | -               | -               | 10 - 20 - 25    |

Les données affichées dans le tableau sont des valeurs approximatives.  
Il peut être nécessaire de les adapter à des applications d'usage individuelles.

HC = Carbure avec revêtement  
HU = Carbure sans revêtement





| Groupe de matériaux                             | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell                       | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                   |                   |
|---|--|---|--------------------------------------|------------------------------------|-------------------|-----------------------------|-------------------|-------------------|
|   |  |   |                                      |                                    |                   | HC                          |                   |                   |
|   |  |   |                                      |                                    |                   | AD2                         | AT10              | AT20              |
| P   | Acier non allié  | C ≤ 0,25 % recuit                               | 125                                  | 428                                | P1                | -                           | 220 - 270 - 320   | 180 - 230 - 280   |
|   |  | C >= 0,25 ... >= 0,55 % recuit                  | 190                                  | 639                                | P2                | -                           | 180 - 235 - 290   | 160 - 205 - 250   |
|   |  | C >= 0,25 ... >= 0,55 % traité                  | 210                                  | 708                                | P3                | -                           | 180 - 235 - 290   | 160 - 205 - 250   |
|   |  | C ≤ 0,55 % recuit                               | 190                                  | 639                                | P4                | -                           | 150 - 200 - 250   | 120 - 170 - 220   |
|   |  | C ≤ 0,55 % traité                               | 300                                  | 1013                               | P5                | -                           | 150 - 200 - 250   | 120 - 170 - 220   |
|   |  | Aciers de décolletage (à copeaux courts) recuit | 220                                  | 745                                | P6                | -                           | 150 - 200 - 250   | 120 - 170 - 220   |
|   | Acier faiblement allié   | recuit  | 175                                  | 591                                | P7                | -                           | 180 - 230 - 280   | 160 - 205 - 250   |
|   |  | traité  | 300                                  | 1013                               | P8                | -                           | 170 - 210 - 250   | 140 - 185 - 230   |
|   |  | traité  | 380                                  | 1282                               | P9                | -                           | 150 - 185 - 220   | 120 - 160 - 200   |
|   |  | traité  | 430                                  | 1477                               | P10               | -                           | 150 - 185 - 220   | 120 - 160 - 200   |
|   | Acier allié et acier outil allié                               | recuit  | 200                                  | 675                                | P11               | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 300                                  | 1013                               | P12               | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 400                                  | 1361                               | P13               | -                           | -                 | -                 |
| Acier inox                                      | ferritique, martensitique, recuit                              | 200   | 675                                  | P14                                | -                 | 170 - 230 - 290             | 160 - 220 - 280   |                   |
|   | martensitique, traité  | 330   | 1114                                 | P15                                | -                 | 140 - 210 - 280             | 130 - 205 - 280   |                   |
| M   | Acier inox   | austénitique                                    | 200                                  | 675                                | M1                | -                           | 140 - 210 - 280   | 140 - 190 - 240   |
|   |  | austénitique                                    | 300                                  | 1013                               | M2                | -                           | -                 | -                 |
|   |  | austénitique-ferritique, Duplex                 | 230                                  | 778                                | M3                | -                           | -                 | -                 |
|   |  | ferritique                                      | 200                                  | 675                                | K1                | -                           | 150 - 180 - 210   | 130 - 165 - 200   |
| K   | Fonte malléable  | perlitique                                      | 260                                  | 867                                | K2                | -                           | 150 - 180 - 210   | 130 - 165 - 200   |
|   |  | faible résistance                               | 180                                  | 602                                | K3                | -                           | 180 - 240 - 300   | 160 - 215 - 270   |
|   | Fonte grise  | haute résistance / austénitique                 | 245                                  | 825                                | K4                | -                           | 120 - 180 - 240   | 110 - 165 - 220   |
|   |  | ferritique                                      | 155                                  | 518                                | K5                | -                           | 140 - 185 - 230   | 130 - 170 - 210   |
|   | Fonte à Graphite sphéroïdale                                   | perlitique                                      | 265                                  | 885                                | K6                | -                           | 120 - 145 - 170   | 110 - 130 - 150   |
|   |  | GGV (CGI)                                       | 200                                  | 675                                | K7                | -                           | 180 - 240 - 300   | 160 - 215 - 270   |
|   | N  | Alliages de fonderie d'aluminium                | ne pouvant pas subir un durcissement | 30                                 | -                 | N1                          | 650 - 1325 - 2000 | 850 - 1075 - 1300 |
| pouvant subir un durcissement, durci            |  |   | 100                                  | 343                                | N2                | 300 - 1150 - 2000           | 400 - 650 - 900   | 400 - 650 - 900   |
| ≤ 12 % Si, ne pouvant pas subir de durcissement |  |   | 75                                   | 260                                | N3                | 650 - 1325 - 2000           | 260 - 530 - 800   | 260 - 530 - 800   |
| Alliage de fonte d'aluminium                    |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90                                   | 314                                | N4                | 300 - 1150 - 2000           | 200 - 375 - 550   | 200 - 375 - 550   |
|   |  | > 12 % Si, ne pouvant pas subir de durcissement | 130                                  | 447                                | N5                | 200 - 1100 - 2000           | 200 - 350 - 500   | 200 - 350 - 500   |
| Alliage de Magnésium                            |  | > 12 % Si, ne pouvant pas subir de durcissement | 70                                   | 250                                | N6                | -                           | -                 | -                 |
|   |  | non allié, cuivre électrolytique                | 100                                  | 343                                | N7                | 130 - 265 - 400             | -                 | -                 |
| Cuivre et alliage de cuivre (bronze / laiton)   |  | Laiton, bronze, fonte rouge                     | 90                                   | 314                                | N8                | 250 - 525 - 800             | -                 | -                 |
|   |  | Alliage de cuivre à copeaux courts              | 110                                  | 382                                | N9                | 250 - 525 - 800             | -                 | -                 |
|   |  | forte résistance, Ampco                         | 300                                  | 1013                               | N10               | -                           | -                 | -                 |
| Matériaux non métalliques                       |  | Thermoplaste (sans agents de charge abrasives)  | -                                    | -                                  | N11               | -                           | -                 | -                 |
|   | Duroplaste (sans agents de charge abrasives)                   | -   | -                                    | N12                                | -                 | -                           | -                 |                   |
|   | Matière plastique renforcée de fibres de verre GFRP            | -   | -                                    | N13                                | -                 | -                           | -                 |                   |
|   | Matière plastique renforcé composite CFRP                      | -   | -                                    | N14                                | -                 | -                           | -                 |                   |
|   | Plastique renforcé fibre aramide AFRP                          | -   | -                                    | N15                                | -                 | -                           | -                 |                   |
|   | Graphite   | 80 Shore  | -                                    | N16                                | -                 | -                           | -                 |                   |
| S   | Alliages réfractaires  | à base de Fe recuit                             | 200                                  | 675                                | S1                | -                           | 20 - 35 - 50      | 20 - 35 - 50      |
|   |  | à base de Fe durci                              | 280                                  | 943                                | S2                | -                           | 20 - 35 - 50      | 20 - 35 - 50      |
|   |  | à base Ni ou Co recuit                          | 250                                  | 839                                | S3                | -                           | 15 - 30 - 40      | 15 - 30 - 40      |
|   |  | à base Ni ou Co durci                           | 350                                  | 1177                               | S4                | -                           | 15 - 25 - 30      | 15 - 25 - 30      |
|   |  | à base Ni ou Co jeter                           | 320                                  | 1076                               | S5                | -                           | 15 - 25 - 30      | 15 - 25 - 30      |
|   | Alliage de titane  | Titane pur                                      | 200                                  | 675                                | S6                | -                           | -                 | -                 |
|   |  | Alliages Alpha + Beta, trempé                   | 375                                  | 1262                               | S7                | -                           | -                 | -                 |
|   |  | Alliages Beta                                   | 410                                  | 1396                               | S8                | -                           | -                 | -                 |
|   | Alliage de tungstène   | 300   | 1013                                 | S9                                 | -                 | -                           | -                 |                   |
|   | Alliage de molybdène   | 300   | 1013                                 | S10                                | -                 | -                           | -                 |                   |
| H   | Acier trempé   | trempe et revenu                                | 50 HRC                               | -                                  | H1                | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 55 HRC                               | -                                  | H2                | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 60 HRC                               | -                                  | H3                | -                           | -                 | -                 |
|   | Fonte durci  | trempe et revenu                                | 55 HRC                               | -                                  | H4                | -                           | -                 | -                 |

Les données affichées dans le tableau sont des valeurs approximatives. Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carbure avec revêtement  
 HU = Carbure sans revêtement

|  | PVD1             | PVD2             | AM4205        |
|--|------------------|------------------|---------------|
|  | 200 - 245 - 290  | 160 - 205 - 250  | -             |
|  | 160 - 210 - 260  | 140 - 180 - 220  | -             |
|  | 160 - 210 - 260  | 140 - 180 - 220  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 130 - 180 - 230  | 110 - 145 - 180  | -             |
|  | 160 - 205 - 250  | 140 - 180 - 220  | -             |
|  | 150 - 190 - 230  | 130 - 165 - 200  | -             |
|  | 130 - 165 - 200  | 110 - 150 - 190  | -             |
|  | 130 - 165 - 200  | 110 - 150 - 190  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 150 - 155 - 160  | 130 - 175 - 220  | -             |
|  | 120 - 185 - 250  | 110 - 155 - 200  | -             |
|  | 120 - 185 - 250  | 120 - 160 - 200  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 130 - 155 - 180  | -                | -             |
|  | 130 - 155 - 180  | -                | -             |
|  | 160 - 215 - 270  | -                | -             |
|  | 110 - 165 - 220  | -                | -             |
|  | 120 - 165 - 210  | -                | -             |
|  | 110 - 130 - 150  | -                | -             |
|  | 160 - 215 - 270  | -                | -             |
|  | 750 - 975 - 1200 | 750 - 975 - 1200 | -             |
|  | 350 - 575 - 800  | 350 - 575 - 800  | -             |
|  | 230 - 465 - 700  | 230 - 465 - 700  | -             |
|  | 180 - 340 - 500  | 180 - 340 - 500  | -             |
|  | 180 - 315 - 450  | 180 - 315 - 450  | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | 15 - 30 - 45     | 15 - 30 - 45     | -             |
|  | 15 - 30 - 45     | 15 - 30 - 45     | -             |
|  | 10 - 25 - 35     | 10 - 25 - 35     | -             |
|  | 10 - 20 - 25     | 10 - 20 - 25     | -             |
|  | 10 - 20 - 25     | 10 - 20 - 25     | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | -             |
|  | -                | -                | 40 - 60 - 80  |
|  | -                | -                | 40 - 60 - 80  |
|  | -                | -                | 60 - 80 - 100 |

| Groupe de matériaux                                 | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                   |                   |
|---|--|---|----------------|------------------------------------|-------------------|-----------------------------|-------------------|-------------------|
|   |  |   |                |                                    |                   | HU                          |                   |                   |
|   |  |   |                |                                    |                   | AK10                        | AK1010            | AK1020            |
| <b>P</b>  | Acier non allié  | C ≤ 0,25 % recuit                               | 125            | 428                                | P1                | -                           | -                 | -                 |
|   |  | C >= 0,25 ... >= 0,55 % recuit                  | 190            | 639                                | P2                | -                           | -                 | -                 |
|   |  | C >= 0,25 ... >= 0,55 % traité                  | 210            | 708                                | P3                | -                           | -                 | -                 |
|   |  | C ≤ 0,55 % recuit                               | 190            | 639                                | P4                | -                           | -                 | -                 |
|   |  | C ≤ 0,55 % traité                               | 300            | 1013                               | P5                | -                           | -                 | -                 |
|   | Acier faiblement allié   | Aciers de décolletage (à copeaux courts) recuit | 220            | 745                                | P6                | -                           | -                 | -                 |
|   |  | recuit  | 175            | 591                                | P7                | -                           | -                 | -                 |
|   |  | traité  | 300            | 1013                               | P8                | -                           | -                 | -                 |
|   |  | traité  | 380            | 1282                               | P9                | -                           | -                 | -                 |
|   |  | traité  | 430            | 1477                               | P10               | -                           | -                 | -                 |
|   | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 300            | 1013                               | P12               | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 400            | 1361                               | P13               | -                           | -                 | -                 |
|   | Acier inox   | ferritique, martensitique, recuit               | 200            | 675                                | P14               | -                           | -                 | -                 |
|   |  | martensitique, traité                           | 330            | 1114                               | P15               | -                           | -                 | -                 |
| <b>M</b>  | Acier inox   | austénitique                                    | 200            | 675                                | M1                | -                           | -                 | -                 |
|   |  | austénitique                                    | 300            | 1013                               | M2                | -                           | -                 | -                 |
|   | Fonte malléable  | austénitique-ferritique, Duplex                 | 230            | 778                                | M3                | -                           | -                 | -                 |
|   |  | ferritique                                      | 200            | 675                                | K1                | 140 - 170 - 200             | 140 - 170 - 200   | 140 - 170 - 200   |
| <b>K</b>  | Fonte grise  | perlitique                                      | 260            | 867                                | K2                | 120 - 140 - 160             | 120 - 140 - 160   | 120 - 140 - 160   |
|   |  | faible résistance                               | 180            | 602                                | K3                | 120 - 140 - 160             | 120 - 140 - 160   | 120 - 140 - 160   |
|   | Fonte à Graphite sphéroïdale                                   | haute résistance / austénitique                 | 245            | 825                                | K4                | 80 - 110 - 140              | 80 - 110 - 140    | 80 - 110 - 140    |
|   |  | ferritique                                      | 155            | 518                                | K5                | 130 - 150 - 170             | 130 - 150 - 170   | 130 - 150 - 170   |
|   |  | perlitique                                      | 265            | 885                                | K6                | 90 - 110 - 130              | 90 - 110 - 130    | 90 - 110 - 130    |
| GGV (CGI)   |  | 200   | 675            | K7                                 | 120 - 140 - 160   | 120 - 140 - 160             | 120 - 140 - 160   |                   |
| <b>N</b>  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30             | -                                  | N1                | 300 - 1400 - 2500           | 300 - 1400 - 2500 | 300 - 1400 - 2500 |
|   |  | pouvant subir un durcissement, durci            | 100            | 343                                | N2                | 200 - 1100 - 2000           | 200 - 1100 - 2000 | 200 - 1100 - 2000 |
|   |  | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75             | 260                                | N3                | 400 - 950 - 1500            | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, pouvant subir un durcissement, durci | 90             | 314                                | N4                | 400 - 950 - 1500            | 400 - 950 - 1500  | 400 - 950 - 1500  |
|   |  | > 12 % Si, ne pouvant pas subir de durcissement | 130            | 447                                | N5                | 200 - 500 - 800             | 200 - 500 - 800   | 200 - 500 - 800   |
|   | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70             | 250                                | N6                | -                           | -                 | -                 |
|   | Cuivre et alliage de cuivre (bronze / laiton)                  | non allié, cuivre électrolytique                | 100            | 343                                | N7                | 150 - 225 - 300             | 150 - 225 - 300   | 150 - 225 - 300   |
|   |  | Laiton, bronze, fonte rouge                     | 90             | 314                                | N8                | 200 - 400 - 600             | 200 - 400 - 600   | 200 - 400 - 600   |
|   |  | Alliage de cuivre à copeaux courts              | 110            | 382                                | N9                | 250 - 425 - 600             | 250 - 425 - 600   | 250 - 425 - 600   |
|   |  | forte résistance, Ampco                         | 300            | 1013                               | N10               | -                           | -                 | -                 |
|   | Matériaux non métalliques                                      | Thermoplaste (sans agents de charge abrasives)  | -              | -                                  | N11               | 80 - 130 - 180              | 80 - 130 - 180    | 80 - 130 - 180    |
|   |  | Duroplaste (sans agents de charge abrasives)    | -              | -                                  | N12               | 80 - 130 - 180              | 80 - 130 - 180    | 80 - 130 - 180    |
| Matériau plastique renforcé de fibres de verre GFRP |  | -   | -              | N13                                | 60 - 105 - 150    | 60 - 105 - 150              | 60 - 105 - 150    |                   |
| Matériau plastique renforcé composite CFRP          |  | -   | -              | N14                                | 60 - 105 - 150    | 60 - 105 - 150              | 60 - 105 - 150    |                   |
| Plastique renforcé fibre aramide AFRP               |  | -   | -              | N15                                | 60 - 105 - 150    | 60 - 105 - 150              | 60 - 105 - 150    |                   |
| Graphite  |  | 80 Shore  | -              | N16                                | -                 | -                           | -                 |                   |
| <b>S</b>  | Alliages réfractaires  | à base de Fe recuit                             | 200            | 675                                | S1                | 15 - 30 - 40                | 15 - 30 - 40      | -                 |
|   |  | à base de Fe durci                              | 280            | 943                                | S2                | 8 - 20 - 28                 | 8 - 20 - 28       | -                 |
|   |  | à base Ni ou Co recuit                          | 250            | 839                                | S3                | 10 - 20 - 30                | 10 - 20 - 30      | -                 |
|   |  | à base Ni ou Co durci                           | 350            | 1177                               | S4                | 8 - 15 - 25                 | 8 - 15 - 25       | -                 |
|   |  | à base Ni ou Co jeter                           | 320            | 1076                               | S5                | 8 - 15 - 25                 | 8 - 15 - 25       | -                 |
|   | Alliage de titane  | Titane pur                                      | 200            | 675                                | S6                | 60 - 90 - 120               | 60 - 90 - 120     | 60 - 90 - 120     |
|   |  | Alliages Alpha + Beta, trempé                   | 375            | 1262                               | S7                | 30 - 55 - 80                | 30 - 55 - 80      | 30 - 55 - 80      |
|   |  | Alliages Beta                                   | 410            | 1396                               | S8                | 30 - 55 - 80                | 30 - 55 - 80      | 30 - 55 - 80      |
|   | Alliage de tungstène   |   | 300            | 1013                               | S9                | -                           | -                 | -                 |
|   | Alliage de molybdène   |   | 300            | 1013                               | S10               | -                           | -                 | -                 |
| <b>H</b>  | Acier trempé   | trempe et revenu                                | 50 HRC         | -                                  | H1                | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 55 HRC         | -                                  | H2                | -                           | -                 | -                 |
|   |  | trempe et revenu                                | 60 HRC         | -                                  | H3                | -                           | -                 | -                 |
|   | Fonte durci  | trempe et revenu                                | 55 HRC         | -                                  | H4                | -                           | -                 | -                 |

Les données affichées dans le tableau sont des valeurs approximatives. Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carbure avec revêtement  
 HU = Carbure sans revêtement



| Groupe de matériaux                            | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell      | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |
|--|--|---|---------------------|------------------------------------|-------------------|-----------------------------|-----------------|
|  |  |   |                     |                                    |                   | CC                          |                 |
|  |  |   |                     |                                    |                   | AP6510                      | AC90C           |
| P  | Acier non allié  | C ≤ 0,25 % recuit                               | 125                 | 428                                | P1                | 300 - 350 - 400             | 220 - 270 - 320 |
|  |  | C >= 0,25 ... >= 0,55 % recuit                  | 190                 | 639                                | P2                | 260 - 305 - 350             | 180 - 235 - 290 |
|  |  | C >= 0,25 ... >= 0,55 % traité                  | 210                 | 708                                | P3                | 260 - 305 - 350             | 180 - 235 - 290 |
|  |  | C ≤ 0,55 % recuit                               | 190                 | 639                                | P4                | 240 - 270 - 300             | 150 - 200 - 250 |
|  |  | C ≤ 0,55 % traité                               | 300                 | 1013                               | P5                | 240 - 270 - 300             | 150 - 200 - 250 |
|  |  | Aciers de décolletage (à copeaux courts) recuit | 220                 | 745                                | P6                | 240 - 270 - 300             | 150 - 200 - 250 |
|  | Acier faiblement allié   | recuit  | 175                 | 591                                | P7                | 220 - 260 - 300             | 180 - 220 - 260 |
|  |  | traité  | 300                 | 1013                               | P8                | 180 - 220 - 260             | 150 - 185 - 220 |
|  |  | traité  | 380                 | 1282                               | P9                | 120 - 170 - 220             | 80 - 135 - 190  |
|  |  | traité  | 430                 | 1477                               | P10               | 120 - 170 - 220             | 80 - 135 - 190  |
|  | Acier allié et acier outil allié                               | recuit  | 200                 | 675                                | P11               | 150 - 185 - 220             | 80 - 115 - 150  |
|  |  | trempe et revenu                                | 300                 | 1013                               | P12               | 70 - 110 - 150              | 40 - 85 - 130   |
|  |  | trempe et revenu                                | 400                 | 1361                               | P13               | 70 - 110 - 150              | 40 - 85 - 130   |
| Acier inox                                     | ferritique, martensitique, recuit                              | 200   | 675                 | P14                                | -                 | 40 - 95 - 150               |                 |
|  | martensitique, traité  | 330   | 1114                | P15                                | -                 | 40 - 90 - 140               |                 |
| M  | Acier inox   | austénitique                                    | 200                 | 675                                | M1                | -                           | 80 - 120 - 160  |
|  |  | austénitique                                    | 300                 | 1013                               | M2                | -                           | 40 - 85 - 130   |
|  |  | austénitique-ferritique, Duplex                 | 230                 | 778                                | M3                | -                           | 40 - 85 - 130   |
| K  | Fonte malléable  | ferritique                                      | 200                 | 675                                | K1                | -                           | 150 - 180 - 210 |
|  |  | perlitique                                      | 260                 | 867                                | K2                | -                           | 150 - 180 - 210 |
|  | Fonte grise  | faible résistance                               | 180                 | 602                                | K3                | -                           | 180 - 240 - 300 |
|  |  | haute résistance / austénitique                 | 245                 | 825                                | K4                | -                           | 120 - 180 - 240 |
|  | Fonte à Graphite sphéroïdale                                   | ferritique                                      | 155                 | 518                                | K5                | -                           | 140 - 185 - 230 |
|  |  | perlitique                                      | 265                 | 885                                | K6                | -                           | 120 - 145 - 170 |
|  | GGV (CGI)  |   | 200                 | 675                                | K7                | -                           | 180 - 240 - 300 |
| N  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30                  | -                                  | N1                | -                           | -               |
|  |  | pouvant subir un durcissement, durci            | 100                 | 343                                | N2                | -                           | -               |
|  | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75                  | 260                                | N3                | -                           | -               |
|  |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90                  | 314                                | N4                | -                           | -               |
|  |  | > 12 % Si, ne pouvant pas subir de durcissement | 130                 | 447                                | N5                | -                           | -               |
|  | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70                  | 250                                | N6                | -                           | -               |
|  |  | non allié, cuivre électrolytique                | 100                 | 343                                | N7                | -                           | 120 - 160 - 200 |
|  | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                     | 90                  | 314                                | N8                | -                           | 200 - 350 - 500 |
|  |  | Alliage de cuivre à copeaux courts              | 110                 | 382                                | N9                | -                           | 200 - 350 - 500 |
|  |  | forte résistance, Ampco                         | 300                 | 1013                               | N10               | -                           | -               |
| Thermoplaste (sans agents de charge abrasives) |  | -   | -                   | N11                                | -                 | 160 - 380 - 600             |                 |
| Matériaux non métalliques                      | Duroplaste (sans agents de charge abrasives)                   | -   | -                   | N12                                | -                 | 160 - 380 - 600             |                 |
|  | Matière plastique renforcée de fibres de verre GFRP            | -   | -                   | N13                                | -                 | 100 - 200 - 300             |                 |
|  | Matière plastique renforcé composite CFRP                      | -   | -                   | N14                                | -                 | 100 - 200 - 300             |                 |
|  | Plastique renforcé fibre aramide AFRP                          | -   | -                   | N15                                | -                 | 100 - 200 - 300             |                 |
|  | Graphite   | 80 Shore  | -                   | N16                                | -                 | -                           |                 |
|  | S  | Alliages réfractaires                           | à base de Fe recuit | 200                                | 675               | S1                          | -               |
| à base de Fe durci                             |  |   | 280                 | 943                                | S2                | -                           | 20 - 40 - 60    |
| à base Ni ou Co recuit                         |  |   | 250                 | 839                                | S3                | -                           | 15 - 35 - 50    |
| à base Ni ou Co durci                          |  |   | 350                 | 1177                               | S4                | -                           | 15 - 30 - 40    |
| à base Ni ou Co jeter                          |  |   | 320                 | 1076                               | S5                | -                           | 15 - 30 - 40    |
| Alliage de titane                              |  | Titane pur                                      | 200                 | 675                                | S6                | -                           | 90 - 135 - 180  |
|  |  | Alliages Alpha + Beta, trempé                   | 375                 | 1262                               | S7                | -                           | 40 - 60 - 80    |
|  |  | Alliages Beta                                   | 410                 | 1396                               | S8                | -                           | 40 - 60 - 80    |
| Alliage de tungstène                           |  |   | 300                 | 1013                               | S9                | -                           | -               |
| Alliage de molybdène                           |  |   | 300                 | 1013                               | S10               | -                           | -               |
| H  | Acier trempé   | trempe et revenu                                | 50 HRC              | -                                  | H1                | -                           | 30 - 40 - 50    |
|  |  | trempe et revenu                                | 55 HRC              | -                                  | H2                | -                           | 10 - 20 - 25    |
|  |  | trempe et revenu                                | 60 HRC              | -                                  | H3                | -                           | 10 - 20 - 25    |
|  | Fonte durci  | trempe et revenu                                | 55 HRC              | -                                  | H4                | -                           | 10 - 20 - 25    |

Les données affichées dans le tableau sont des valeurs approximatives. Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carbure avec revêtement  
 HU = Carbure sans revêtement  
 CC = Cermet avec revêtement

| Groupe de matériaux              | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell      | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |
|----------------------------------|--|---|---------------------|------------------------------------|-------------------|-----------------------------|-----------------|
|                                  |  |   |                     |                                    |                   | CU                          |                 |
|                                  |  |   |                     |                                    |                   | ACE6                        | AP6010          |
| P                                | Acier non allié  | C ≤ 0,25 % recuit                                   | 125                 | 428                                | P1                | 100 - 250 - 400             | 100 - 275 - 450 |
|                                  |  | C >= 0,25 ... >= 0,55 % recuit                      | 190                 | 639                                | P2                | 80 - 225 - 370              | 80 - 265 - 450  |
|                                  |  | C >= 0,25 ... >= 0,55 % traité                      | 210                 | 708                                | P3                | 80 - 225 - 370              | 80 - 265 - 450  |
|                                  |  | C ≤ 0,55 % recuit                                   | 190                 | 639                                | P4                | 50 - 200 - 350              | 50 - 200 - 350  |
|                                  |  | C ≤ 0,55 % traité                                   | 300                 | 1013                               | P5                | 50 - 200 - 350              | 50 - 200 - 350  |
|                                  | Acier faiblement allié   | Aciers de décolletage (à copeaux courts) recuit     | 220                 | 745                                | P6                | 50 - 200 - 350              | 50 - 200 - 350  |
|                                  |  | recuit  | 175                 | 591                                | P7                | 80 - 190 - 300              | 80 - 265 - 450  |
|                                  |  | traité  | 300                 | 1013                               | P8                | 70 - 170 - 270              | 70 - 260 - 450  |
|                                  |  | traité  | 380                 | 1282                               | P9                | 50 - 150 - 250              | 50 - 200 - 350  |
|                                  |  | traité  | 430                 | 1477                               | P10               | 50 - 150 - 250              | 50 - 200 - 350  |
| Acier allié et acier outil allié | recuit   | 200   | 675                 | P11                                | 80 - 140 - 200    | 60 - 155 - 250              |                 |
|                                  | trempe et revenu   | 300   | 1013                | P12                                | 50 - 105 - 160    | 50 - 115 - 180              |                 |
| Acier inox                       | trempe et revenu   | 400   | 1361                | P13                                | 50 - 105 - 160    | 50 - 115 - 180              |                 |
|                                  | ferritique, martensitique, recuit                              | 200   | 675                 | P14                                | 80 - 165 - 250    | 80 - 190 - 300              |                 |
| M                                | Acier inox   | martensitique, traité                               | 330                 | 1114                               | P15               | 80 - 165 - 250              | 80 - 215 - 350  |
|                                  |  | austénitique  | 200                 | 675                                | M1                | 80 - 160 - 240              | 80 - 190 - 300  |
|                                  |  | austénitique  | 300                 | 1013                               | M2                | 80 - 160 - 240              | 60 - 180 - 300  |
|                                  |  | austénitique-ferritique, Duplex                     | 230                 | 778                                | M3                | 80 - 160 - 240              | 60 - 180 - 300  |
| K                                | Fonte malléable  | ferritique  | 200                 | 675                                | K1                | 80 - 215 - 350              | 100 - 200 - 300 |
|                                  |  | perlitique  | 260                 | 867                                | K2                | 60 - 155 - 250              | 100 - 200 - 300 |
|                                  | Fonte grise  | faible résistance                                   | 180                 | 602                                | K3                | 80 - 190 - 300              | 100 - 200 - 300 |
|                                  |  | haute résistance / austénitique                     | 245                 | 825                                | K4                | 80 - 160 - 240              | 100 - 200 - 300 |
|                                  | Fonte à Graphite sphéroïdale                                   | ferritique  | 155                 | 518                                | K5                | 80 - 190 - 300              | 100 - 200 - 300 |
|                                  |  | perlitique  | 265                 | 885                                | K6                | 80 - 165 - 250              | 100 - 200 - 300 |
| GGV (CGI)                        |  | 200   | 675                 | K7                                 | 80 - 190 - 300    | 100 - 200 - 300             |                 |
| N                                | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement                | 30                  | -                                  | N1                | -                           | -               |
|                                  |  | pouvant subir un durcissement, durci                | 100                 | 343                                | N2                | -                           | -               |
|                                  |  | ≤ 12 % Si, ne pouvant pas subir de durcissement     | 75                  | 260                                | N3                | -                           | -               |
|                                  | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, pouvant subir un durcissement, durci     | 90                  | 314                                | N4                | -                           | -               |
|                                  |  | > 12 % Si, ne pouvant pas subir de durcissement     | 130                 | 447                                | N5                | -                           | -               |
|                                  | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement     | 70                  | 250                                | N6                | -                           | -               |
|                                  |  | non allié, cuivre électrolytique                    | 100                 | 343                                | N7                | -                           | -               |
|                                  | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                         | 90                  | 314                                | N8                | -                           | -               |
|                                  |  | Alliage de cuivre à copeaux courts                  | 110                 | 382                                | N9                | -                           | -               |
|                                  |  | forte résistance, Ampco                             | 300                 | 1013                               | N10               | -                           | -               |
|                                  |  | Thermoplaste (sans agents de charge abrasives)      | -                   | -                                  | N11               | -                           | -               |
|                                  | Matériaux non métalliques                                      | Duroplaste (sans agents de charge abrasives)        | -                   | -                                  | N12               | -                           | -               |
|                                  |  | Matière plastique renforcée de fibres de verre GFRP | -                   | -                                  | N13               | -                           | -               |
|                                  |  | Matière plastique renforcée composite CFRP          | -                   | -                                  | N14               | -                           | -               |
|                                  |  | Plastique renforcé fibre aramide AFRP               | -                   | -                                  | N15               | -                           | -               |
|                                  |  | Graphite  | 80 Shore            | -                                  | N16               | -                           | -               |
| S                                |  | Alliages réfractaires                               | à base de Fe recuit | 200                                | 675               | S1                          | -               |
|                                  | à base de Fe durci   |   | 280                 | 943                                | S2                | -                           | -               |
|                                  | à base Ni ou Co recuit   |   | 250                 | 839                                | S3                | -                           | -               |
|                                  | à base Ni ou Co durci  |   | 350                 | 1177                               | S4                | -                           | -               |
|                                  | à base Ni ou Co jeter  |   | 320                 | 1076                               | S5                | -                           | -               |
|                                  | Alliage de titane  | Titane pur  | 200                 | 675                                | S6                | -                           | -               |
|                                  |  | Alliages Alpha + Beta, trempé                       | 375                 | 1262                               | S7                | -                           | -               |
|                                  |  | Alliages Beta                                       | 410                 | 1396                               | S8                | -                           | -               |
|                                  | Alliage de tungstène   |   | 300                 | 1013                               | S9                | -                           | -               |
|                                  | Alliage de molybdène   |   | 300                 | 1013                               | S10               | -                           | -               |
| H                                | Acier trempé   | trempe et revenu                                    | 50 HRC              | -                                  | H1                | -                           | -               |
|                                  |  | trempe et revenu                                    | 55 HRC              | -                                  | H2                | -                           | -               |
|                                  |  | trempe et revenu                                    | 60 HRC              | -                                  | H3                | -                           | -               |
|                                  | Fonte durci  | trempe et revenu                                    | 55 HRC              | -                                  | H4                | -                           | -               |

Les données affichées dans le tableau sont des valeurs approximatives.  
Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carburé avec revêtement  
HU = Carburé sans revêtement

| Groupe de matériaux                | Structure des groupes de matériaux et des lettres de référence | Dureté Brinell                                      | Résistance RM (N/mm <sup>2</sup> )              | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |                   |                   |                 |
|------------------------------------|--|---|---|-------------------|-----------------------------|-----------------|-------------------|-------------------|-----------------|
|                                    |  |   |   |                   | HU                          |                 |                   |                   |                 |
|                                    |  |   |   |                   | AM350                       | AK1020          | AK10              |                   |                 |
| P                                  | Acier non allié  | C ≤ 0,25 % recuit                                   | 125   | 428               | P1                          | 180 - 205 - 230 | -                 | -                 |                 |
|                                    |  | C >= 0,25 ... >= 0,55 % recuit                      | 190   | 639               | P2                          | 170 - 180 - 190 | -                 | -                 |                 |
|                                    |  | C >= 0,25 ... >= 0,55 % traité                      | 210   | 708               | P3                          | 170 - 180 - 190 | -                 | -                 |                 |
|                                    |  | C ≤ 0,55 % recuit                                   | 190   | 639               | P4                          | 100 - 120 - 140 | -                 | -                 |                 |
|                                    |  | C ≤ 0,55 % traité                                   | 300   | 1013              | P5                          | 100 - 120 - 140 | -                 | -                 |                 |
|                                    | Acier faiblement allié   | Aciers de décolletage (à copeaux courts) recuit     | 220   | 745               | P6                          | 100 - 120 - 140 | -                 | -                 |                 |
|                                    |  | recuit  | 175   | 591               | P7                          | 170 - 180 - 190 | -                 | -                 |                 |
|                                    |  | traité  | 300   | 1013              | P8                          | 90 - 120 - 150  | -                 | -                 |                 |
|                                    |  | traité  | 380   | 1282              | P9                          | 70 - 100 - 130  | -                 | -                 |                 |
|                                    | Acier allié et acier outil allié                               | traité  | 430   | 1477              | P10                         | 70 - 100 - 130  | -                 | -                 |                 |
|                                    |  | recuit  | 200   | 675               | P11                         | 120 - 160 - 200 | -                 | -                 |                 |
|                                    |  | trempe et revenu                                    | 300   | 1013              | P12                         | 50 - 75 - 100   | -                 | -                 |                 |
|                                    | Acier inox   | trempe et revenu                                    | 400   | 1361              | P13                         | 50 - 75 - 100   | -                 | -                 |                 |
| ferritique, martensitique, recuit  |  | 200   | 675   | P14               | 140 - 160 - 180             | -               | -                 |                   |                 |
| martensitique, traité              |  | 330   | 1114  | P15               | 110 - 135 - 160             | -               | -                 |                   |                 |
| M                                  | Acier inox   | austénitique  | 200   | 675               | M1                          | 120 - 155 - 190 | -                 | -                 |                 |
|                                    |  | austénitique  | 300   | 1013              | M2                          | 80 - 115 - 150  | -                 | -                 |                 |
|                                    |  | austénitique-ferritique, Duplex                     | 230   | 778               | M3                          | 80 - 115 - 150  | -                 | -                 |                 |
|                                    |  | ferritique  | 200   | 675               | K1                          | -               | 140 - 170 - 200   | 140 - 170 - 200   |                 |
| K                                  | Fonte malléable  | perlitique  | 260   | 867               | K2                          | -               | 120 - 140 - 160   | 120 - 140 - 160   |                 |
|                                    |  | faible résistance                                   | 180   | 602               | K3                          | -               | 120 - 140 - 160   | 120 - 140 - 160   |                 |
|                                    | Fonte grise  | haute résistance / austénitique                     | 245   | 825               | K4                          | -               | 80 - 110 - 140    | 80 - 110 - 140    |                 |
|                                    |  | ferritique  | 155   | 518               | K5                          | -               | 130 - 150 - 170   | 130 - 150 - 170   |                 |
| N                                  | GGV (CGI)  | perlitique  | 265   | 885               | K6                          | -               | 90 - 110 - 130    | 90 - 110 - 130    |                 |
|                                    |  | recuit  | 200   | 675               | K7                          | -               | 120 - 140 - 160   | 120 - 140 - 160   |                 |
|                                    | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement                | 30  | -                 | N1                          | -               | 300 - 1400 - 2500 | 300 - 1400 - 2500 |                 |
|                                    |  | pouvant subir un durcissement, durci                | 100   | 343               | N2                          | -               | 200 - 1100 - 2000 | 200 - 1100 - 2000 |                 |
|                                    |  | ≤ 12 % Si, ne pouvant pas subir de durcissement     | 75  | 260               | N3                          | -               | 400 - 950 - 1500  | 400 - 950 - 1500  |                 |
|                                    |  | ≤ 12 % Si, pouvant subir un durcissement, durci     | 90  | 314               | N4                          | -               | 400 - 950 - 1500  | 400 - 950 - 1500  |                 |
|                                    |  | > 12 % Si, ne pouvant pas subir de durcissement     | 130   | 447               | N5                          | -               | 200 - 500 - 800   | 200 - 500 - 800   |                 |
|                                    | Matériaux non métalliques                                      | Alliage de Magnésium                                | > 12 % Si, ne pouvant pas subir de durcissement | 70                | 250                         | N6              | -                 | -                 | -               |
|                                    |  |   | non allié, cuivre électrolytique                | 100               | 343                         | N7              | -                 | 150 - 225 - 300   | 150 - 225 - 300 |
|                                    |  | Cuivre et alliage de cuivre (bronze / laiton)       | Laiton, bronze, fonte rouge                     | 90                | 314                         | N8              | -                 | 200 - 400 - 600   | 200 - 400 - 600 |
| Alliage de cuivre à copeaux courts |  |   | 110   | 382               | N9                          | -               | 250 - 425 - 600   | 250 - 425 - 600   |                 |
| Alliages réfractaires              |  | forte résistance, Ampco                             | 300   | 1013              | N10                         | -               | -                 | -                 |                 |
|                                    |  | Thermoplaste (sans agents de charge abrasives)      | -   | -                 | N11                         | -               | 80 - 130 - 180    | 80 - 130 - 180    |                 |
|                                    |  | Duroplaste (sans agents de charge abrasives)        | -   | -                 | N12                         | -               | 80 - 130 - 180    | 80 - 130 - 180    |                 |
|                                    |  | Matière plastique renforcée de fibres de verre GFRP | -   | -                 | N13                         | -               | 60 - 105 - 150    | 60 - 105 - 150    |                 |
|                                    |  | Matière plastique renforcé composite CFRP           | -   | -                 | N14                         | -               | 60 - 105 - 150    | 60 - 105 - 150    |                 |
|                                    |  | Plastique renforcé fibre aramide AFRP               | -   | -                 | N15                         | -               | 60 - 105 - 150    | 60 - 105 - 150    |                 |
| S                                  | Alliages réfractaires  | Graphite  | 80 Shore  | -                 | N16                         | -               | -                 | -                 |                 |
|                                    |  | à base de Fe recuit                                 | 200   | 675               | S1                          | 20 - 30 - 40    | -                 | 15 - 30 - 40      |                 |
|                                    |  | à base de Fe durci                                  | 280   | 943               | S2                          | 15 - 25 - 35    | -                 | 8 - 20 - 28       |                 |
|                                    |  | à base Ni ou Co recuit                              | 250   | 839               | S3                          | 8 - 15 - 25     | -                 | 10 - 20 - 30      |                 |
|                                    |  | à base Ni ou Co durci                               | 350   | 1177              | S4                          | 4 - 10 - 15     | -                 | 8 - 15 - 25       |                 |
|                                    | Alliage de titane  | à base Ni ou Co jeter                               | 320   | 1076              | S5                          | 4 - 10 - 15     | -                 | 8 - 15 - 25       |                 |
|                                    |  | Titane pur  | 200   | 675               | S6                          | -               | 60 - 90 - 120     | 60 - 90 - 120     |                 |
|                                    |  | Alliages Alpha + Beta, trempé                       | 375   | 1262              | S7                          | -               | 30 - 55 - 80      | 30 - 55 - 80      |                 |
|                                    |  | Alliages Beta                                       | 410   | 1396              | S8                          | -               | 30 - 55 - 80      | 30 - 55 - 80      |                 |
|                                    |  | Alliage de tungstène                                | 300   | 1013              | S9                          | -               | -                 | -                 |                 |
| H                                  | Alliage de molybdène   | Alliage de molybdène                                | 300   | 1013              | S10                         | -               | -                 |                   |                 |
|                                    |  | Acier trempé  | trempe et revenu                                | 50 HRC            | -                           | H1              | -                 | -                 |                 |
|                                    |  | trempe et revenu                                    | 55 HRC  | -                 | H2                          | -               | -                 |                   |                 |
|                                    | Fonte durci  | trempe et revenu                                    | 60 HRC  | -                 | H3                          | -               | -                 |                   |                 |
| trempe et revenu                   |  | 55 HRC  | -   | H4                | -                           | -               |                   |                   |                 |

Les données affichées dans le tableau sont des valeurs approximatives. Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carbure avec revêtement  
 HU = Carbure sans revêtement  
 CC = Cermet avec revêtement

|  |                 |                 |        | HC              |
|--|-----------------|-----------------|--------|-----------------|
|  | AM5120          | AM5220          | AM5015 | AM2030          |
|  | 220 - 270 - 320 | 180 - 230 - 280 | -      | 170 - 195 - 220 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 180 - 235 - 290 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 150 - 200 - 250 | 120 - 170 - 220 | -      | 120 - 130 - 140 |
|  | 180 - 220 - 260 | 160 - 205 - 250 | -      | 160 - 170 - 180 |
|  | 150 - 185 - 220 | 140 - 185 - 230 | -      | 80 - 110 - 140  |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 135 - 190  | 120 - 160 - 200 | -      | 60 - 90 - 120   |
|  | 80 - 115 - 150  | 70 - 110 - 150  | -      | 110 - 150 - 190 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 40 - 65 - 90    |
|  | 40 - 95 - 150   | 50 - 105 - 160  | -      | 130 - 150 - 170 |
|  | 40 - 90 - 140   | 40 - 90 - 140   | -      | 100 - 125 - 150 |
|  | 80 - 120 - 160  | 70 - 110 - 150  | -      | 100 - 140 - 180 |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 40 - 85 - 130   | 35 - 80 - 120   | -      | 70 - 105 - 140  |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 150 - 180 - 210 | 150 - 180 - 210 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | 120 - 180 - 240 | 120 - 180 - 240 | -      | -               |
|  | 140 - 185 - 230 | 140 - 185 - 230 | -      | -               |
|  | 120 - 145 - 170 | 120 - 145 - 170 | -      | -               |
|  | 180 - 240 - 300 | 180 - 240 - 300 | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 120 - 160 - 200 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | 200 - 350 - 500 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 160 - 380 - 600 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | 100 - 200 - 300 | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 20 - 30 - 40    |
|  | 20 - 40 - 60    | 20 - 40 - 60    | -      | 15 - 25 - 35    |
|  | 15 - 35 - 50    | 15 - 35 - 50    | -      | 8 - 15 - 25     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 15 - 30 - 40    | 15 - 30 - 40    | -      | 4 - 10 - 15     |
|  | 90 - 135 - 180  | -               | -      | 80 - 105 - 130  |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | 40 - 60 - 80    | -               | -      | 15 - 25 - 35    |
|  | -               | -               | -      | -               |
|  | -               | -               | -      | -               |
|  | 30 - 40 - 50    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |
|  | 10 - 20 - 25    | -               | -      | -               |



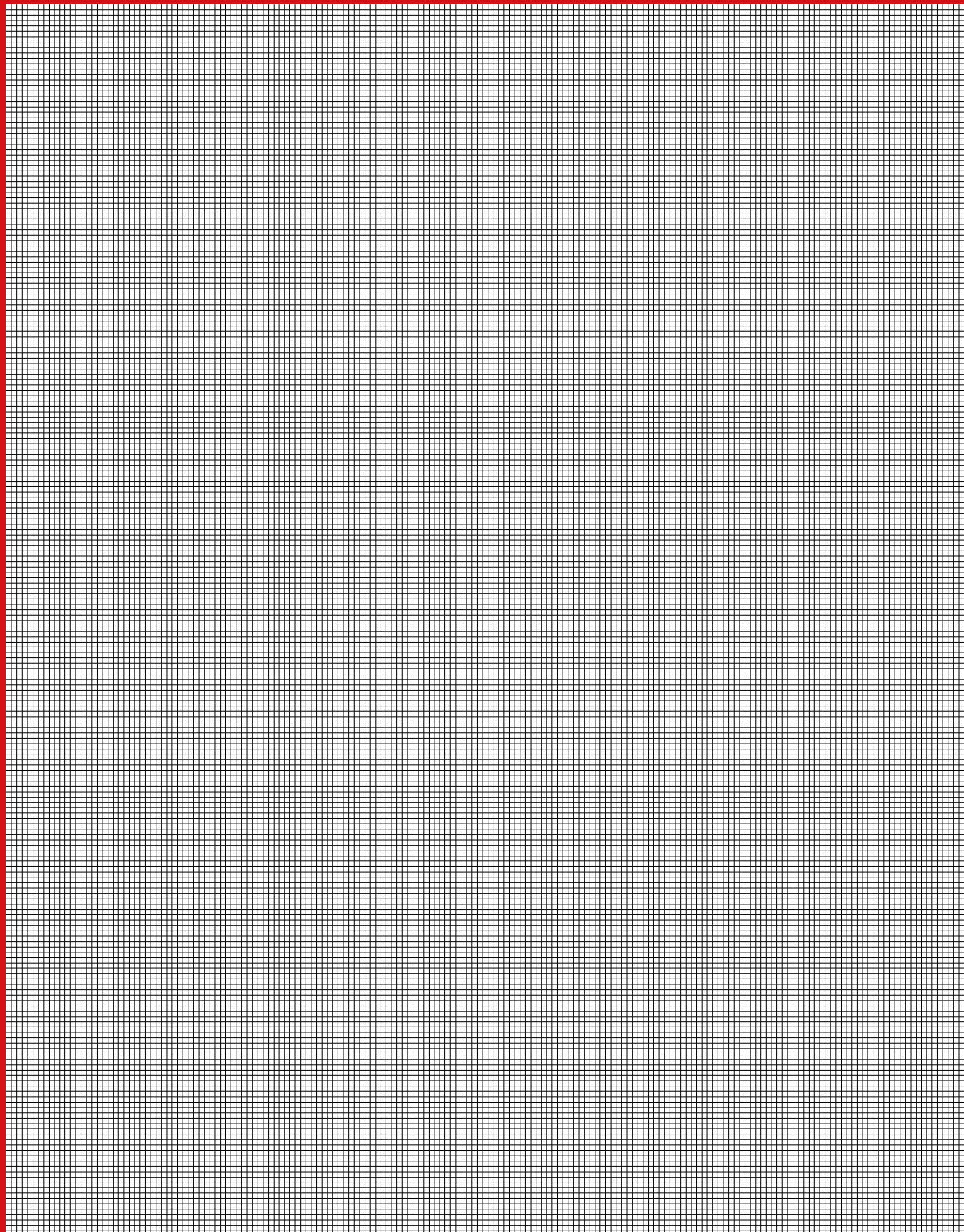
**For more information see**

*Per maggiori informazioni visita il sito*

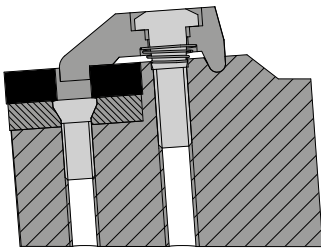
Vous trouverez de plus amples informations sur



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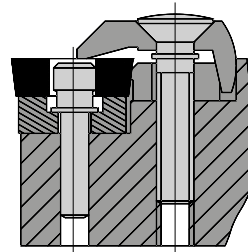


# TURNING – CLAMPING SYSTEMS



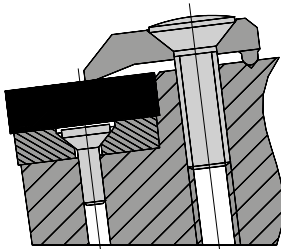
## Top clamping – negative

The top clamping system locates the indexable insert against the contact surface and presses it to the insert seat. This guarantees positioning accuracy. The new clamping system prevents the indexable insert from tipping in the seat. Boring bars are equipped with through tool coolant (A...DWLNR... with integrated coolant hole). This ensures optimised cooling and reliable chip evacuation. A replacement spacer and screw are integrated in the holder shank.



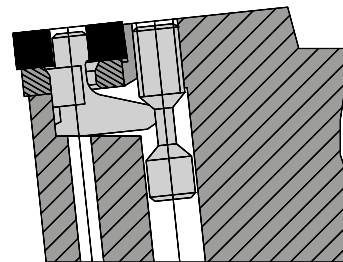
## Top clamping with wedge

This clamping system for positive indexable inserts is reliably clamping from the top and through a hole. A solid carbide pad provides tool with additional protection.



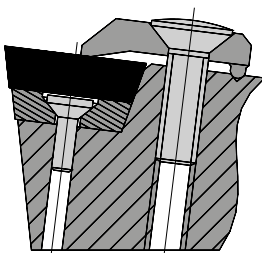
## Top clamping – negative

Clamping system for negative indexable inserts. It features rugged design and easy handling. A solid carbide pad provides tool with additional protection.



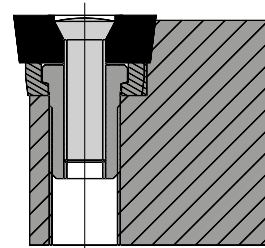
## Lever lock clamping

Clamping by means of a lever lock for centre hole indexable inserts with negative basic shape. Special properties include firmer clamping and fast insert change. No loose spare parts when the clamping system is released. A solid carbide pad provides tool with additional protection.



## Top clamping – positive

Clamping system for positive indexable inserts. It features rugged design and easy handling. A solid carbide pad provides tool with additional protection.



## Screw clamping

Clamping system for positive indexable inserts with counter-sunk hole. Simple clamping system without obstructions permit smooth chip evacuation and simple change of spare parts. A solid carbide pad provides tool with additional protection.

# FUNCTION OF WIPER GEOMETRIES

WIPER geometries have a trailing edge located between the radius run-out and the corner cutting edge. The surface finish remains the same even at double the feed rate. Considerable productivity increase and cost savings are achieved by reducing the machine time, the optimised chip control and the increase in tool life.

## Benefits

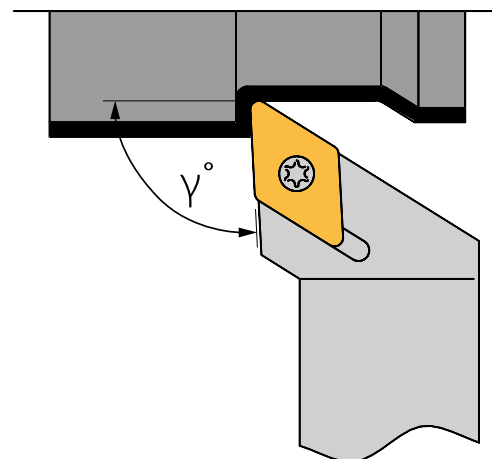
- **Improved surface finish**  
A significantly better surface finish is obtained with the same machining data (exception: with unstable clamping conditions)
- **Higher feed rates**  
Roughing and finishing with just one insert
- **Optimised chip control**  
Higher feed rates produce thicker chips that break more easily
- **Longer tool life**  
Higher feed rates shorten machining time per part and reduce wear

# APPROACH ANGLE

The approach angle must be maintained exactly, otherwise the WIPER geometry fails to have the desired effect (trailing edge) and there is no improvement in surface finish.

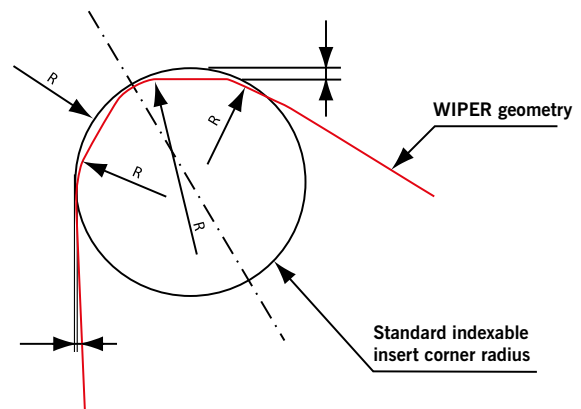
The following approach angles must be maintained:

- CCGT 95°
- DCGT 93°
- VCGT 93°
- WCGT 95°



# CONTOUR DISTORTION

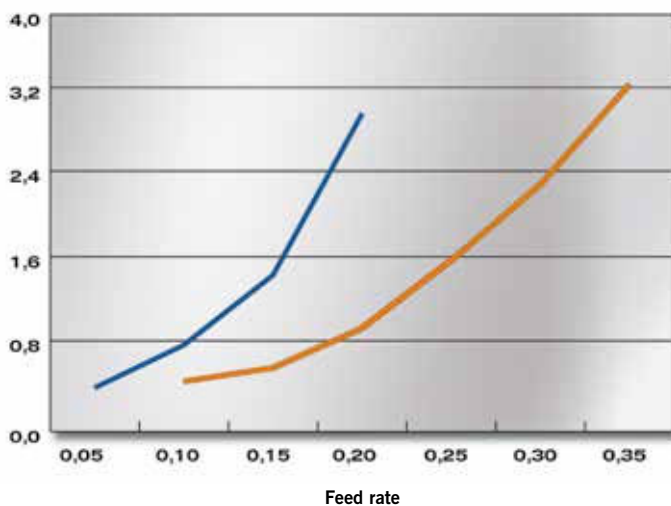
The trailing edge causes contour distortion (see drawing). This distortion occurs with radii, chamfers and undercuts.



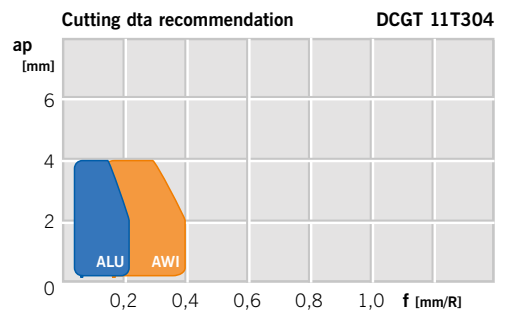
4

# WIPER GEOMETRIES AND CUTTING DATA

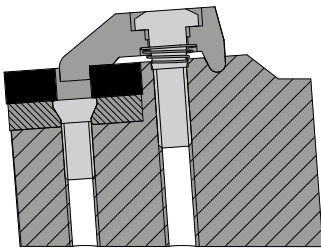
WIP geometries are direction-dependent due to the trailing edge. The chip is then evacuated easily. This should be observed when turning and facing (for example when turning a large diameter to a small diameter).



DCGT 11T304FN-ALU  
DCGT 11T304FN-AWI

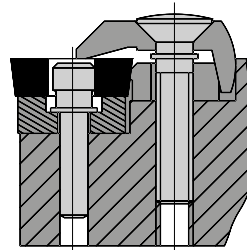


# TORNITURA - SISTEMI DI BLOCCAGGIO



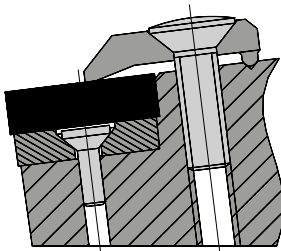
## Bloccaggio a staffa - negativo

Con il bloccaggio a staffa l'inserto viene tirato contemporaneamente sulla superficie di appoggio e premuto nella sede dell'inserto. In questo modo si ottiene una precisione di posizionamento garantita. Questo sistema di bloccaggio impedisce l'inclinazione dell'inserto nella sede. I barenì sono dotati di adduzione interna del refrigerante (A...DWLNR... con ugello refrigerante integrato) che garantisce un raffreddamento ottimale e una sicura evacuazione dei trucioli. Nello stelo del supporto sono collocate la piastra di supporto sostitutiva integrata e la vite.



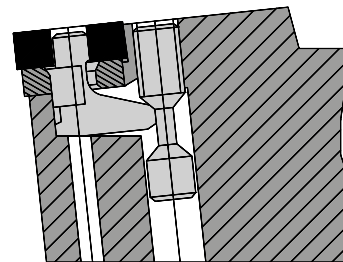
## Bloccaggio a cuneo

Con questo sistema di bloccaggio per inserti positivi gli inserti vengono serrati da sopra e da sotto il foro. Un'ulteriore protezione dell'utensile grazie alla piastra di appoggio in metallo duro.



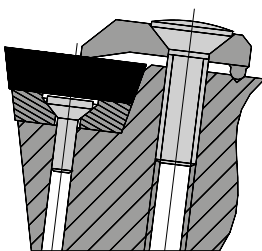
## Bloccaggio a staffa - negativo

Sistema di bloccaggio per inserti negativi. Si contraddistingue per una esecuzione robusta e per la semplice maneggevolezza. Un'ulteriore protezione dell'utensile grazie alla piastra di appoggio in metallo duro.



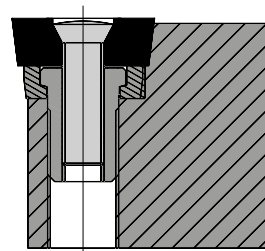
## Bloccaggio della leva

Bloccaggio tramite leva per inserti con foro centrale con forma di base negativa. Caratteristiche particolari sono una notevole corsa di serraggio e una rapida sostituzione dell'inserto. Quando il sistema di bloccaggio viene rilasciato, non ci sono pezzi di ricambio allentati. Un'ulteriore protezione dell'utensile grazie alla piastra di appoggio in metallo duro.



## Bloccaggio a staffa - positivo

Sistema di bloccaggio per inserti positivi. Si contraddistingue per una esecuzione robusta e per la semplice maneggevolezza. Un'ulteriore protezione dell'utensile grazie alla piastra di appoggio in metallo duro.



## Bloccaggio a vite

Bloccaggio di inserti positivi con foro svasato. Il sistema di bloccaggio semplice senza sovrastrutture consente un'evacuazione dei trucioli regolare e la sostituzione dei ricambi senza problemi. Un'ulteriore protezione dell'utensile grazie alla piastra di appoggio in metallo duro.

# FUNZIONAMENTO DELLE GEOMETRIE WIPER

Le geometrie WIPER sono dotate di un tagliente a trascinamento situato tra lo scarico del raggio e il bordo del tagliente laterale. Anche se i valori di avanzamento vengono raddoppiati le finiture superficiali restano invariate. Grazie alla riduzione del tempo di lavorazione, al controllo ottimale della truciolatura e all'aumento della durata Lei potrà ottenere un chiaro aumento della produttività con una contemporanea riduzione dei costi.

## Vantaggi

- **Correzione della finitura superficiale**  
Con dati di lavorazione invariati si ottiene una migliore finitura superficiale (eccezione: in caso di tensioni instabili)
- **Valori di avanzamento più elevati**  
Possibili con un inserto lavorazione di sgrossatura e di finitura
- **Controllo ottimale del truciolo**  
Elevate velocità di avanzamento producono trucioli più spessi che si rompono meglio
- **Miglioramento delle durate**  
Velocità di avanzamento più elevate riducono il tempo di lavorazione per ogni pezzo e rallentano l'usura

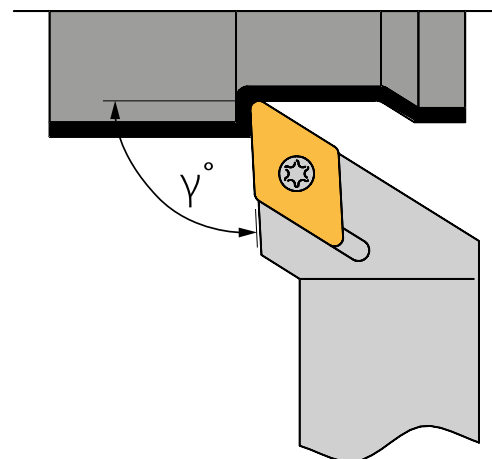
4

# ANGOLO DI ATTACCO

L'angolo di attacco deve essere rispettato esattamente poiché altrimenti l'effetto desiderato della geometria WIPER (tagliente di trascinamento) non si verifica e non vengono prodotte superfici di buona qualità.

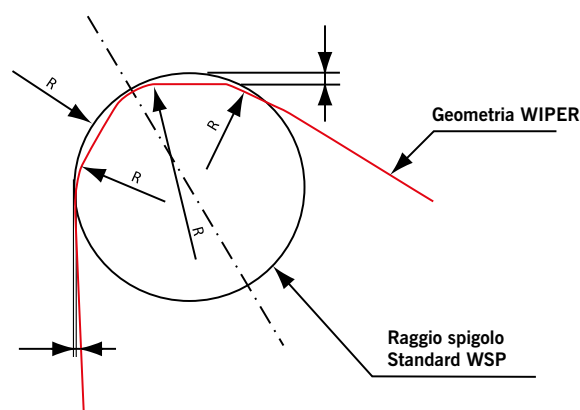
**Devono essere rispettati i seguenti angoli di attacco:**

- CCGT 95° Gradi
- DCGT 93° Gradi
- VCGT 93° Gradi
- WCGT 95° Gradi



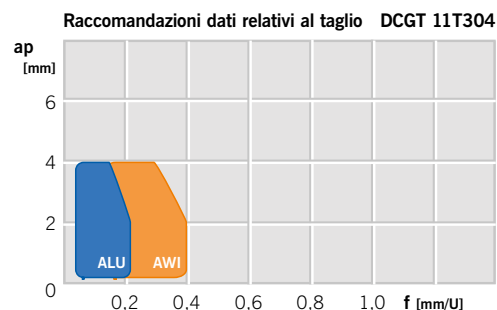
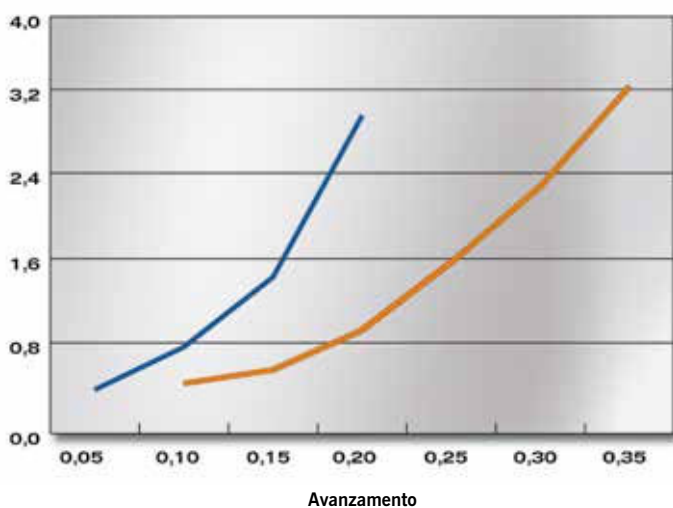
## DISTORSIONE DEL PROFILO

Con il tagliente a trascinamento si produce una distorsione del profilo (vedere disegno). Queste distorsioni si verificano per raggi, smussi, spoglie e scarichi.

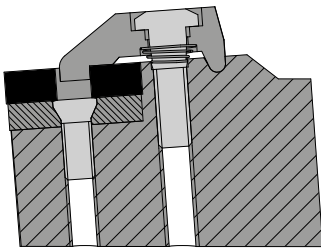


## DIREZIONE DI TAGLIO E VALORI DI TAGLIO

Le geometrie WIPER sono legate alla direzione dal tagliente a trascinamento. Solo così il truciolo può essere prodotto in modo ottimale dal tagliente. È necessario tenerne conto per la sfacciatura e per la lavorazione longitudinale (ad esempio nella sfacciatura, lavorazione da un diametro grande ad un diametro piccolo).

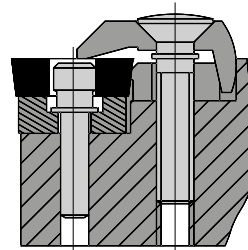


# TOURNAGE – SYSTÈMES DE FIXATION



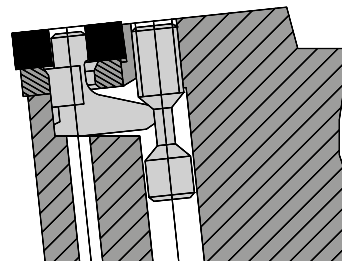
## Serrage par bride – négatif

Le serrage par bride permet de tirer la plaquette de coupe amovible contre la surface de contact tout en l'appuyant contre le logement de plaquette. On obtient ainsi une précision de positionnement garantie. Ce nouveau système de fixation empêche la plaquette amovible de basculer dans le logement. Les barres d'alésage sont équipées d'un système de refroidissement interne (A...DWLNR... avec buse d'arrosage intégrée) qui assure un refroidissement optimal et une évacuation sûre des copeaux. La tige du support comporte une cale de support de rechange intégrée et une vis.



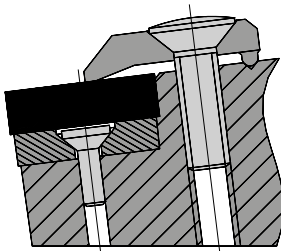
## Serrage par cale à bride

Dans ce système de fixation pour plaquettes de coupe amovibles positives, ces dernières sont solidement fixées par le haut et par perçage. Protection supplémentaire de l'outil par une plaque de support en carbure.



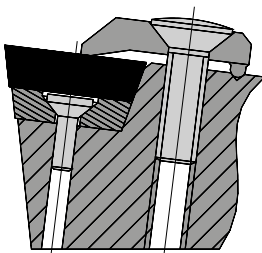
## Serrage par levier à genouillère

Serrage par levier de serrage pour plaquettes de coupe amovibles à trou central et à forme de base négative. Ce système de fixation se caractérise par une grande course de serrage et un changement rapide des plaquettes. Il n'y a aucune pièce de rechange desserrée lorsque le système de fixation est défait. Protection supplémentaire de l'outil par une plaque de support en carbure.



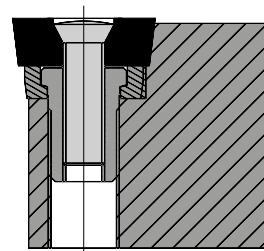
## Serrage par bride – négatif

Système de fixation pour plaquettes de coupe amovibles négatives. Il se distingue par sa conception robuste et une manipulation simple. Protection supplémentaire de l'outil par une plaque de support en carbure.



## Serrage par bride – positif

Système de fixation pour plaquettes de coupe amovibles positives. Il se distingue par sa conception robuste et une manipulation simple. Protection supplémentaire de l'outil par une plaque de support en carbure.



## Serrage par vis

Serrage de plaquettes de coupe amovibles positives avec contre-alésage. Un système de fixation simple qui permet une évacuation sans problèmes des copeaux et un changement sans difficultés des pièces de rechange. Protection supplémentaire de l'outil par une plaque de support en carbure.



# FONCTION DES GÉOMÉTRIES WIPER

Les géométries WIPER sont dotées d'une plaquette « wiper » située entre l'évacuation du rayon et le arête de coupe latéral. Même dans le cas d'un dédoublement des valeurs d'avance, les états de surface restent identiques. Grâce à la réduction du temps d'usinage, à un contrôle optimal des copeaux et à l'augmentation de la durée de vie, vous parvenez à une amélioration nette de la productivité tout en réduisant les coûts.

## Avantages

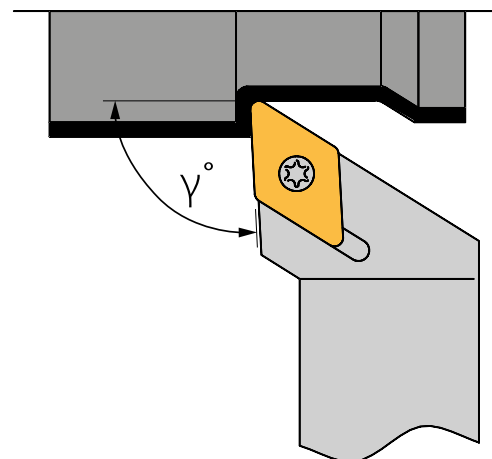
- **Amélioration des états de surface**  
À données d'usinage identiques, on obtient des états de surface nettement meilleurs (sauf pour les usinages instables)
- **Valeurs d'avance plus élevées**  
Usinage d'ébauche et de finition possible avec une plaquette de coupe
- **Contrôle optimal des copeaux**  
Des avances élevées produisent des copeaux plus épais qui cassent plus facilement
- **Augmentation de la durée de vie**  
Des avances plus élevées diminuent le temps d'usinage par pièce et retardent l'usure

# ANGLE D'ATTAQUE

L'angle d'attaque doit être respecté précisément, sinon la géométrie WIPER ne produira pas l'effet escompté (plaquette WIPER) et vous n'obtiendrez pas de bonnes surfaces.

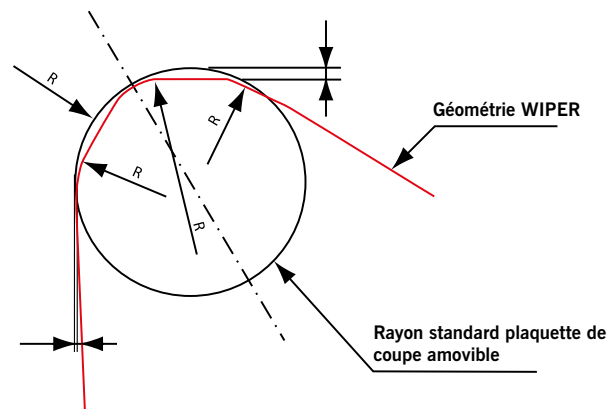
**Les angles d'attaque suivants doivent être respectés :**

- CCGT 95° degrés
- DCGT 93° degrés
- VCGT 93° degrés
- WCGT 95° degrés



# DÉFORMATION DES CONTOURS

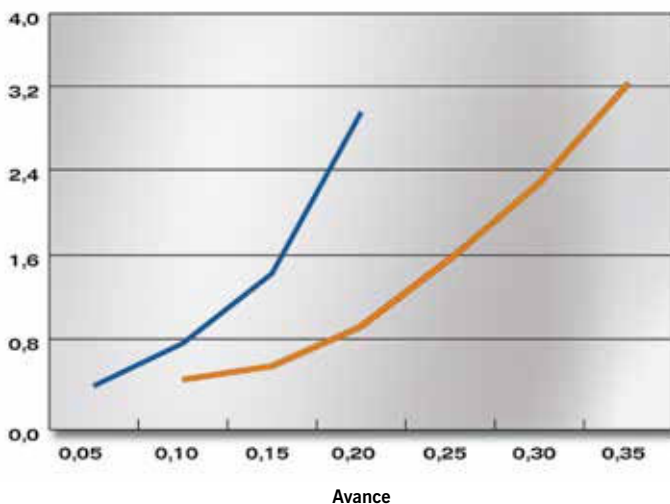
La plaquette WIPER entraîne une déformation des contours (voir schéma). Ces déformations se produisent lors de l'usinage de rayons, le chanfreinage, le biseautage et l'usinage de gorges.



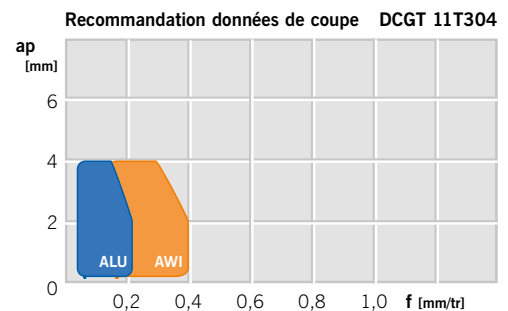
4

# SENS DE COUPE ET VALEURS DE COUPE RECOMMANDÉES

Les géométries WIPER sont sensibles à l'angle d'orientation par la plaquette WIPER. C'est le seul moyen qui permette d'évacuer le copeau de la dent de manière optimale. Ceci doit être respecté lors de l'usinage transversal et longitudinal (par ex., usinage transversal pour usiner un petit diamètre à partir d'un grand diamètre).



DCGT 11T304FN-ALU  
DCGT 11T304FN-AWI



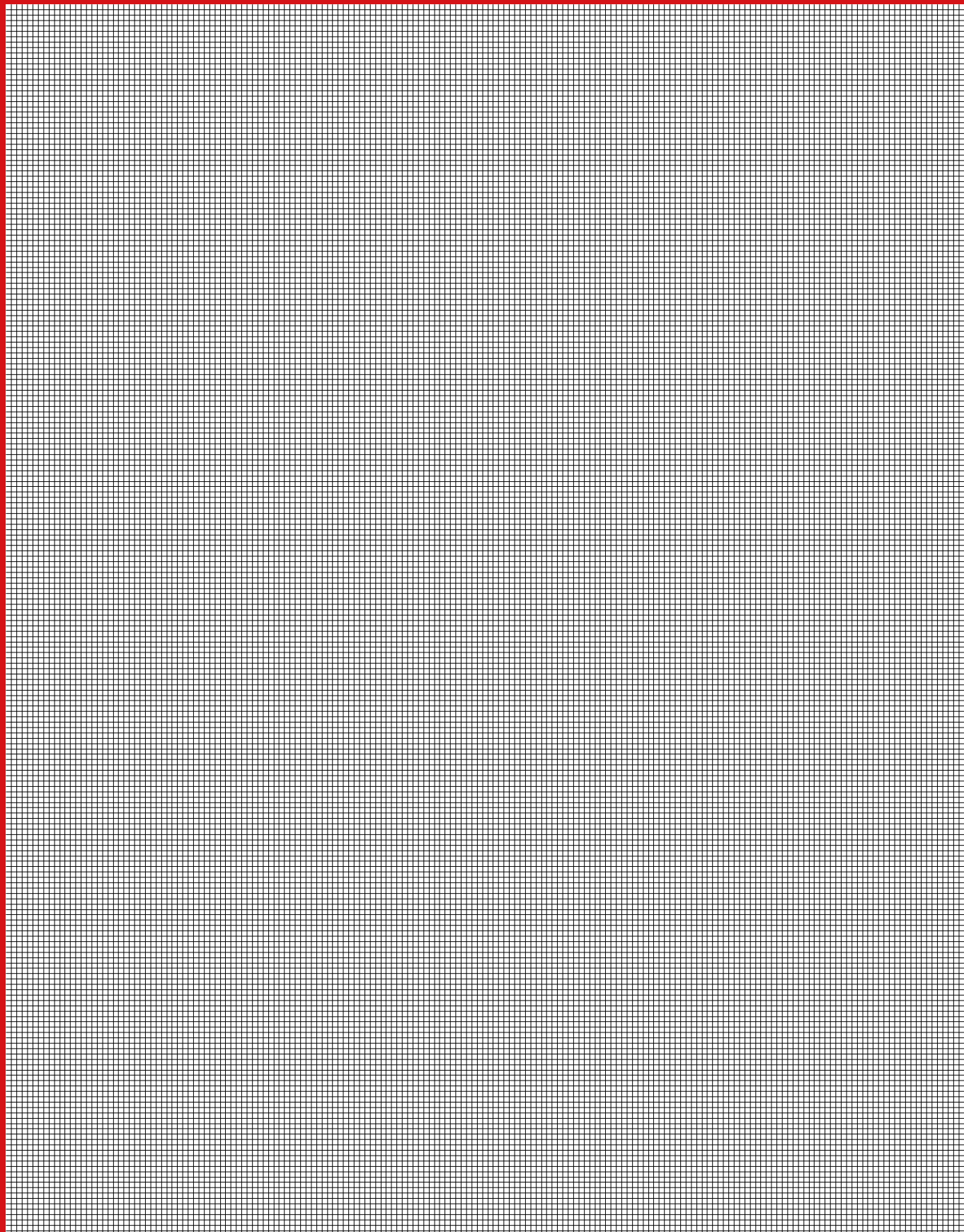
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# BRAZED INDEXABLE INSERTS

## Brazed indexable inserts

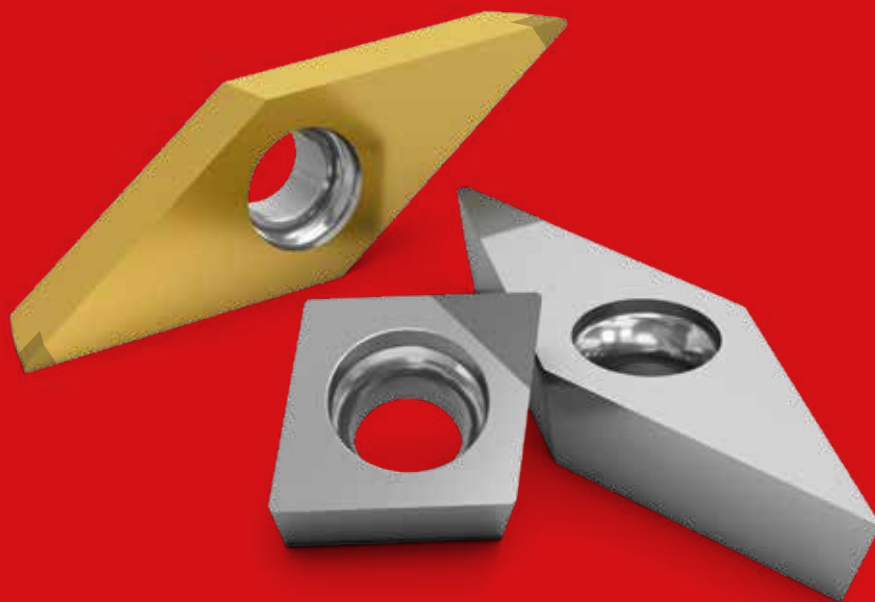
- System presentation
- Description of grades
- Description of geometries
- ISO indexable inserts
- Recommended cutting data

## *Inserti con riporti duri*

- *Presentazione del sistema*
- *Descrizione delle qualità*
- *Descrizione delle geometrie*
- *Inserti ISO a fissaggio meccanico*
- *Parametri di taglio*

## Plaquettes de coupe amovibles équipées

- Présentation du système 424 – 427
- Descriptions des nuances 428 – 432
- Descriptions des géométries 433 – 436
- Plaquettes de coupe amovibles ISO 437 – 466
- Valeurs de coupe recommandées 468 – 473



# 5

# THIS IS WHERE IT COMES TO THE CRUNCH. QUI LA SFIDA SI FA APERTA. LES CHOSES SÉRIEUSES COMMENCENT ICI.

## For high surface finish quality and productivity with hardened materials: CBN indexable inserts from ARNO.

Why hard turning? Because it is very efficient with extremely long tool life, ensures high surface finish quality and preserves the environment. Why ARNO? Because our coated CBN grades shine due to the special hardness up to 65 HRC and heat resistance. This is obtained by the uniform distribution of CBN grain and binder and a high degree of purity. And because ARNO offers the best solution with seven grades and two chamfer designs for each application – also for extremely hard materials and high cutting speeds.

If you are looking for a cost-efficient alternative for hard turning, here it is: the AH4205 grade is excellent for steels up to 52 HRC. For more information, see Section 4.

## Per garantire finiture superficiali e la produttività più elevate con i materiali temprati: gli inserti CBN di ARNO.

*Perché eseguire la lavorazione su materiali duri? Perché grazie alla durata estrema il risultato è molto efficiente, sono garantite finiture superficiali di qualità elevata e si tutela anche l'ambiente. Perché ARNO? Perché le nostre varietà CBN rivestite si distinguono per la particolare durezza, che raggiunge i 65 HRC, e per la resistenza al calore, caratteristiche ottenute grazie alla distribuzione equilibrata di grana e di legante CBN e all'elevato grado di purezza del materiale. E perché ARNO, con sette varietà diverse e due esecuzioni dello smusso, offre soluzioni ottimali per ogni applicazione - anche per materiali estremamente duri e per velocità di taglio estremamente elevate.*

*Se Lei sta cercando un'alternativa economica per la tornitura di materiali duri - eccola: La varietà AH4205 è particolarmente adatta per gli acciai fino a 52 HRC. Maggiori informazioni in merito sono disponibili nel Capitolo 4.*

## Pour des finitions de surface de qualité supérieure et une productivité maximale avec les matières trempées : les plaquettes de coupe amovibles CBN d'ARNO.

Pourquoi le tournage dur ? Parce que c'est un processus très efficace avec une durée de vie très longue qui garantit des finitions de surface de grande qualité et préserve l'environnement. Pourquoi ARNO ? Parce que nos nuances à revêtement CBN se distinguent par des duretés spécifiques allant jusqu'à 65 HRC et une résistance à la chaleur obtenue grâce à une répartition uniforme du grain abrasif CBN et du liant ainsi qu'à un degré de pureté élevé. Et parce qu'ARNO offre la solution optimale pour chaque application grâce à sept nuances et deux versions biseautées, même pour les matériaux extrêmement durs et les plus grandes vitesses de coupe.

Si vous recherchez une alternative économique pour le tournage dur, ne cherchez plus : la nuance AH4205 convient parfaitement pour les aciers jusqu'à 52 HRC. Vous trouverez plus d'informations à ce sujet au chapitre 4.

## Coated CBN grades – we thought of everything

Whether high speed, different cutting speeds or interrupted cuts:  
Everything is possible with CBN indexable inserts from ARNO.



*Le varietà rivestite in CBN -  
abbiamo pensato a tutto*

· Alte velocità di taglio, variabili profondità di taglio o tagli interrotti: con gli inserti CBN di ARNO tutto è possibile.

*Nuances CBN à revêtement – ARNO pense à tout*

· Qu'il s'agisse de vitesse rapide, de différentes vitesses de coupe ou de coupes interrompues : g grâce aux plaquettes de coupe amovibles CBN d'ARNO, tout est possible.

## The alternative for finishing hardened steels

· There is also a combination of NFS chip breaker and AH4205 grade  
for perfect surface finish quality with steels up to 52 HRC.



*L'alternativa per la finitura di  
acciai temprati*

· Per ottenere finiture superficiali perfette con acciai fino a 52 HRC è disponibile anche la combinazione con canale rompitrucciolo NFS e con la varietà AH4205.

*L'alternative pour la finition d'aciers trempés*

· Pour des finitions de surface irréprochables avec des aciers allant jusqu'à 52 HRC, il existe également la combinaison brise-copeaux NFS et nuance AH4205.

## System presentation

Presentazione del sistema

Présentation du système

# BRILLIANT VIEWS. SPLENDIDE PROSPETTIVE. DE BRILLANTES PERSPECTIVES.

## The solution for more speed for machining non-ferrous metals: PCD indexable inserts from ARNO.

Just made for challenging applications such as alloy wheels: diamond indexable inserts from ARNO. They are precise in the long term, even at high speed or with interrupted cuts. The material is extremely abrasion-resistant and prevents edge build-up. All application steps can be executed with the suitable lasered chip breakers – from roughing through to polish machining.

## La soluzione per ridurre i tempi di lavorazione dei metalli non ferrosi: gli inserti PKD di ARNO.

Perfettamente adatta per applicazioni impegnative come i cerchioni in alluminio: gli inserti diamantati di ARNO. Conservano a lungo la precisione, anche a velocità elevata o con tagli interrotti. Il materiale è estremamente resistente all'usura e previene la formazione di taglienti di riporto. Grazie ai rompitrucciolo lavorati al laser possono essere eseguite tutte le fasi di applicazione, dalla sgrossatura alla tornitura brillante.

## La solution pour plus de cadence dans l'usinage de métaux non ferreux : les plaquettes de coupe amovibles PKD d'ARNO.

Créées pour les applications exigeantes comme l'usinage des jantes en aluminium ; les plaquettes de coupe amovibles diamant d'ARNO. Elles sont constamment précises, même à une cadence élevée ou lors de coupes interrompues. Le matériau est extrêmement résistant à l'usure et prévient la formation d'arêtes rapportées. Les brise-copeaux découpés au laser permettent ainsi d'exécuter toutes les coupes, de l'ébauche au tournage de super finition.





## With diamond and laser to the finish

- Alloy wheels easily and efficient machined step by step: no problem with PCD indexable inserts with lasered chip breaker from ARNO.

## *Con il diamante e il laser fino alla finitura*

- *Eseguire la lavorazione dei cerchi in alluminio in modo semplice ed efficiente, passo per passo: nessun problema con gli inserti PCD con rompitruciolo al laser di ARNO.*

## Avec diamant et laser jusqu'à la finition

- Usinage de jantes en aluminium simple et efficace étape par étape : aucun problème grâce aux plaquettes de coupe amovibles PCD avec brise-copeaux découpé au laser d'ARNO.

## Everything for wheel rim machining

- ARNO Werkzeuge in collaboration with OCHEL offers a complete system of tools to machine aluminium wheels. For more details, visit [drehen.arno.de](http://drehen.arno.de)

## *Tutto ciò che serve per la lavorazione dei cerchi*

- *ARNO Werkzeuge , in cooperazione con OCHEL propone un sistema di utensili completo per la lavorazione di cerchi in alluminio. Maggiori informazioni sono disponibili su: [drehen.arno.de](http://drehen.arno.de)*

## Tout pour l'usinage des jantes

- En coopération avec OCHEL, ARNO propose un système d'outils complet pour l'usinage de jantes en aluminium. Pour plus d'infos, consultez : [drehen.arno.de](http://drehen.arno.de)

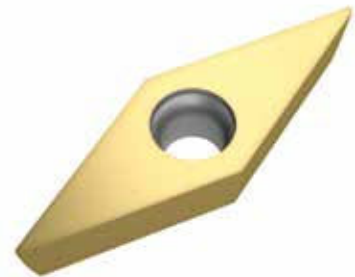




**BC – CBN COATED**  
**BC – CBN RIVESTITO**  
**AVEC REVÊTEMENT BC – CBN**

**AH7810**

- For cutting speeds up to 300 m/Min
- Very good in smooth cut
- Very high wear resistance
- Per velocità di taglio fino a 300 m/min
- Ottimo per il taglio costante
- Elevatissima resistenza all'usura
- Pour des vitesses de coupe allant jusqu'à 300 m/min
- Très bien pour les coupes continues
- Très grande résistance à l'usure



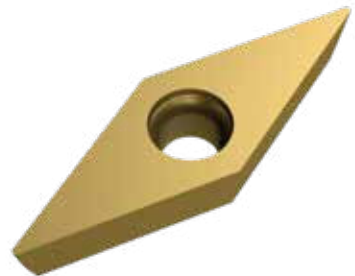
Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité



**AH7815**

- For high cutting speeds
- Suitable for varying cutting depths
- Good wear resistance
- Per elevate velocità di taglio
- Adatto per profondità di taglio variabili
- Buona resistenza all'usura
- Pour des vitesses de coupe élevées
- Convient pour des profondeurs de coupe variables
- Bonne résistance à l'usure



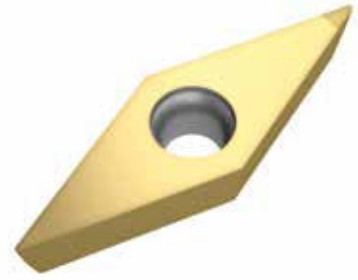
Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité



# AH7820

- Universal grade
- Suitable for interrupted cuts
- Low to high cutting speeds
- *Qualità universale*
- *Adatto per il taglio interrotto*
- *Velocità basse ed elevate*
- Nuance universelle
- Convient pour une coupe interrompue
- Pour des vitesses de coupe faibles à élevées



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AH7825

- Suitable for severely interrupted cuts
- High tensile strength
- Good wear resistance
- *Adatto a tagli fortemente interrotti*
- *Elevata resistenza alla rottura*
- *Buona resistenza all'usura*
- Convient pour les coupes très interrompues
- Grande résistance à la rupture
- Bonne résistance à l'usure



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



5

# BU – CBN UNCOATED

## BU – CBN NON RIVESTITO

### SANS REVÊTEMENT BU – CBN

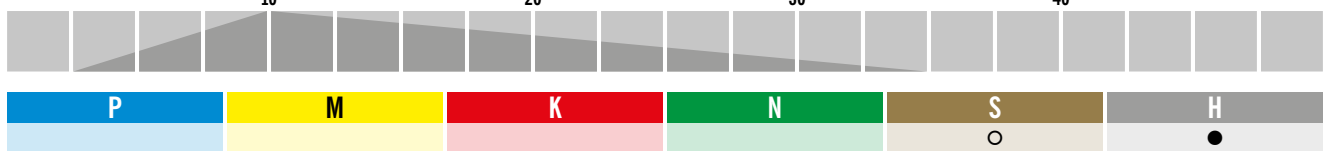
## AH7510

- Suitable for smooth and slightly interrupted cuts
- High CBN content
- Very high wear resistance
- *Adatto per taglio costante o leggermente interrotto*
- *Elevato contenuto di CBN*
- *Elevatissima resistenza all'usura*
- Convient pour une coupe continue et légèrement interrompue
- Forte teneur en CBN
- Très grande résistance à l'usure



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AH7516

- Suitable for smooth cut
- Low CBN content
- Special ceramic binder
- *Adatto per il taglio costante*
- *Basso tenore di CBN*
- *Legante ceramico speciale*
- Convient pour une coupe nette
- Faible teneur en CBN
- Liant en céramique spécial



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



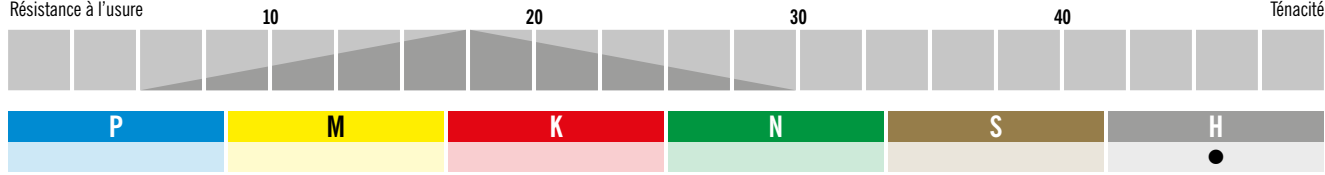
## AH7520

- Suitable for smooth and slightly interrupted cuts
- Low CBN content
- **Very high wear resistance, compression strength and toughness**
- *Adatto per taglio costante o leggermente interrotto*
- *Basso tenore di CBN*
- *Resistenza all'usura molto elevata, resistenza alla compressione e durezza*
- Convient pour une coupe nette et légèrement interrompue
- Faible teneur en CBN
- Très grande résistance à l'usure, résistance à la compression et ténacité



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

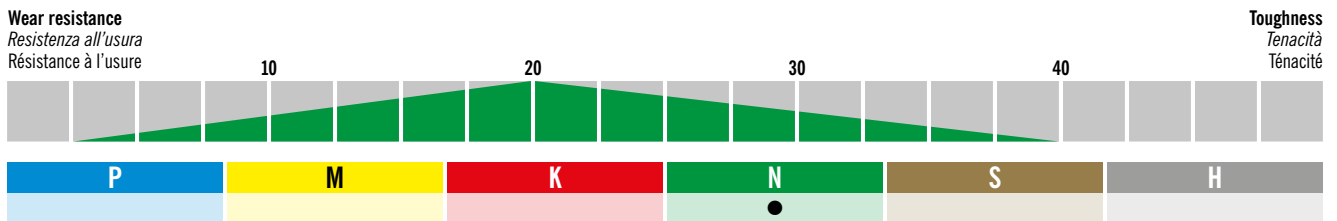
Toughness  
Tenacità  
Ténacité



**DU – PCD UNCOATED**  
**DU – SANS REVÊTEMENT PCD**  
**DU – PCD NON RIVESTITO**

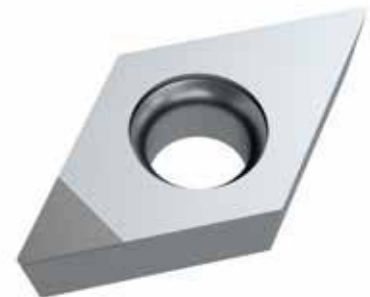
**AN8020**

- For finishing to roughing at high cutting speed
- Polycrystalline, carbide reinforced diamond on carbide pad
- Good wear resistance and toughness
- *Dalla finitura alla sgrossatura ad elevata velocità di taglio*
- *Diamante policristallino con base in metallo duro*
- *Buona resistenza all'usura e tenacità*
- Pour la finition jusqu'à l'ébauche à grande vitesse de coupe
- *Diamant polycristallin avec support en carbure*
- *Bonnes résistance à l'usure et ténacité*



**AN8025**

- For finishing to roughing at high cutting speed
- Polycrystalline, carbide reinforced diamond on carbide pad
- Good wear resistance and toughness
- *Dalla finitura alla sgrossatura ad elevata velocità di taglio*
- *Diamante policristallino con base in metallo duro*
- *Buona resistenza all'usura e tenacità*
- Pour la finition jusqu'à l'ébauche à grande vitesse de coupe
- *Diamant polycristallin avec support en carbure*
- *Bonnes résistance à l'usure et ténacité*



# BRAZED FINISHING TO MEDIUM MACHINING

*RIPORTI DURI DA FINITURA A LAVORAZIONE MEDIA*

DE LA FINITION BRASÉES À L'USINAGE DE SEMI-FINITION

## -AM-2

- Suitable for general hard turning
- For smooth to slightly interrupted cuts
- High tensile strength
- *Adatti alla lavorazione su materiali duri generali*
- *Adatto per tagli costanti o leggermente interrotti*
- *Elevata resistenza alla rottura*
- Convient pour le tournage dur général
- Pour une coupe continue à légèrement interrompue
- Plus grande résistance à la rupture



double edged  
bilaterale  
des deux côtés



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  | ● | ●   | ● | ●  | ● |

## -EW

- One-way segment
- *Monodirezionale*
- Une arête de coupe



double edged  
bilaterale  
des deux côtés



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  | ● | ●   | ● | ●  | ● |

# -MC

- Multicut
- With two one-way segments
- *Multidirezionale*
- *Con due riporti monouso*
- Multicut
- Avec deux arêtes de coupe



single edged  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  |   | •   |   | •  | • |

# -MW

- Multiple-way
- Regrindable
- *Multidirezionale*
- *Riaffilabile*
- Réutilisable
- Peut être réaffûtée



single edged  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  |   | •   | • | •  | • |

# -PFA

- Fine lasered chip breaker
- For finish and medium machining non-ferrous metals
- Optimised chip evacuation
- *Canalino formatruciolo con lavorazione al laser fine*
- *Per la finitura e la lavorazione media di metalli non ferrosi*
- *Controllo truciolo ottimizzato*
- Brise-copeaux découpé finement au laser
- Pour l'usinage de finition et de semi-finition de métaux non ferreux
- Débit optimisé des copeaux



single edged  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  |   |   | • |  |   |

# BRAZED FINISHING TO ROUGH MACHINING

RIPORTI DURI PER FINITURA E SGROSSATURA

DE LA FINITION BRASÉES À L'ÉBAUCHE

## -IWC

- Specially developed to machine alloy wheels
- With fine lasered chip breaker
- For high material removal and very good surface finish quality
- Sviluppata specialmente per la lavorazione di cerchi in alluminio
- Canalino formatrucciolo con lavorazione al laser fine
- Per elevate asportazioni ed ottima finitura superficiale
- Spécialement conçu pour l'usinage de jantes en aluminium
- Avec brise-copeaux découpé finement au laser
- Pour de grands volumes d'usinage et de bonnes finitions de surface



single edged  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |

## -AWI WIPER

- WIPER geometry
- Optimised chip control
- High surface finish quality
- Geometria WIPER
- Controllo della truciolatura ottimizzato
- Finiture superficiali superiori
- Géométrie WIPER
- Contrôle optimisé des copeaux
- Finitions de surface optimales



single edged  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |



## BRAZED ROUGH MACHINING

*RIPORTI DURI PER LAVO-  
RAZIONE DI SGROSSATURA*

*ÉBAUCHE BRASÉES*

### -PMA

- Optimised chip evacuation
- Fine lasered chip breaker
- *Controllo truciolo ottimizzato*
- *Canalino formatruciolo con lavorazione al laser fine*
- Débit optimisé des copeaux
- Brise-copeaux découpé finement au laser



single edged  
su un lato  
d'un côté



Finishing  
*Finitura*  
Finition

Medium machining  
*Medie asportazioni*  
Usinage de semi-finition

Rough machining  
*Sgrossatura*  
Ébauche

P

M

K

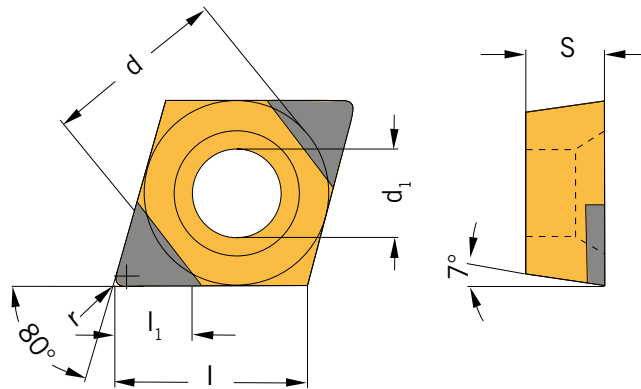
N

S

H



## CCGW



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d      | s    | d <sub>1</sub> | r   | DU     |        | BC     |        |        | BU     |        |
|------------------------------------|-------|----------------|--------|------|----------------|-----|--------|--------|--------|--------|--------|--------|--------|
|                                    |       |                |        |      |                |     | AN8020 | AN8025 | AH7810 | AH7815 | AH7820 | AH7825 | AH7510 |
| CCGW 060202TN-AM-2                 | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,2 |        |        | ◆      | ◆      | ◆      |        |        |
| CCGW 060204TN-AM-2                 | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,4 |        |        | ◆      | ◆      | ◆      |        |        |
| CCGW 09T304TN-AM-2                 | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,4 |        |        | ◆      | ◆      | ◆      |        |        |
| CCGW 09T308TN-AM-2                 | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,8 |        |        | ◆      | ◆      | ◆      | ◆      |        |
| CCGW 060202FN-MW                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,2 | ◆      | ◆      |        |        |        | ◆      | ◆      |
| CCGW 060202TN-MW                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,2 |        |        |        |        |        | ◆      | ◆      |
| CCGW 060204FN-MW                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,4 | ◆      | ◆      |        |        |        | ◆      | ◆      |
| CCGW 060204TN-MW                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,4 |        |        |        |        |        | ◆      | ◆      |
| CCGW 09T302FN-MW                   | 9,67  | 2,5            | 9,520  | 3,97 | 4,4            | 0,2 | ◆      | ◆      |        |        |        |        | ◆      |
| CCGW 09T304FN-MW                   | 9,67  | 2,5            | 9,520  | 3,97 | 4,4            | 0,4 | ◆      | ◆      |        |        |        |        | ◆      |
| CCGW 09T308FN-MW                   | 9,67  | 2,5            | 9,520  | 3,97 | 4,4            | 0,8 | ◆      | ◆      |        |        |        |        | ◆      |
| CCGW 120404FN-MW                   | 12,90 | 4,0            | 12,700 | 4,76 | 5,5            | 0,4 | ◆      | ◆      |        |        |        |        | ◆      |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement

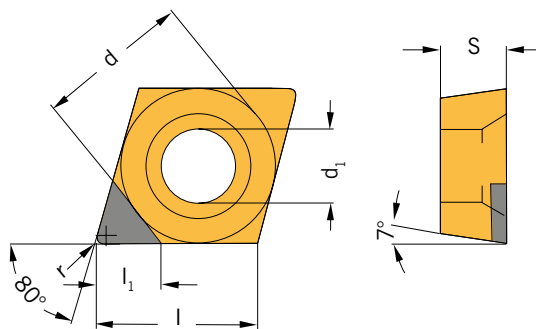
BU = CBN super hard cutting materials uncoated / Materiali da taglio extra duri CBN non rivestiti / Matériaux de coupe ultra-durs CBN sans revêtement

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P |   |   |   |   |   |   |   |   |   |   |   |   |   |
| M |   |   |   |   |   |   |   |   |   |   |   |   |   |
| K |   |   |   |   |   |   |   |   |   |   |   |   |   |
| N | ● | ● |   |   |   |   |   |   |   |   |   |   |   |
| S |   | ○ |   |   |   |   |   |   |   |   |   | ○ |   |
| H |   |   | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

CCGW



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d      | s    | d <sub>1</sub> | r   | DU     | BU     |        |        |
|------------------------------------|-------|----------------|--------|------|----------------|-----|--------|--------|--------|--------|
|                                    |       |                |        |      |                |     | AN8020 | AH7510 | AH7516 | AH7520 |
| CCGW 060204TN-EW                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,4 |        |        | ◆      | ◆      |
| CCGW 09T304FN-EW                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,4 | ◆      |        |        | ◆      |
| CCGW 09T304TN-EW                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,4 |        |        | ◆      |        |
| CCGW 09T308FN-EW                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,8 |        |        |        | ◆      |
| CCGW 09T308TN-EW                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,8 |        |        |        | ◆      |
| CCGW 120404FN-EW                   | 12,90 | 2,5            | 12,700 | 4,76 | 5,5            | 0,4 | ◆      |        |        | ◆      |
| CCGW 120404TN-EW                   | 12,90 | 2,5            | 12,700 | 4,76 | 5,5            | 0,4 |        |        |        | ◆      |
| CCGW 120408TN-EW                   | 12,90 | 2,5            | 12,700 | 4,76 | 5,5            | 0,8 |        |        |        | ◆      |
| CCGW 060202TN-MC                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,2 |        | ◆      | ◆      | ◆      |
| CCGW 060204TN-MC                   | 6,45  | 2,5            | 6,350  | 2,38 | 2,8            | 0,4 |        | ◆      | ◆      | ◆      |
| CCGW 09T302FN-MC                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,2 |        |        |        | ◆      |
| CCGW 09T302TN-MC                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,2 |        | ◆      | ◆      | ◆      |
| CCGW 09T304FN-MC                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,4 |        |        |        | ◆      |
| CCGW 09T304TN-MC                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,4 |        | ◆      | ◆      | ◆      |
| CCGW 09T308TN-MC                   | 9,67  | 2,5            | 9,525  | 3,97 | 4,4            | 0,8 |        | ◆      | ◆      | ◆      |
| CCGW 09T304FN-W <sup>1)</sup>      | 9,67  | 2,5            | 9,520  | 3,97 | 4,4            | 0,4 | ◆      |        |        |        |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

1) Application notes for WIPER geometries are on pages 414–415

Suggerimenti tecnici per le geometrie WIPER sono disponibili alle pagine 417–418

Vous trouverez les consignes d'utilisation des géométries WIPER aux pages 420–421

|   |   |   |   |
|---|---|---|---|
| P |   |   |   |
| M |   |   |   |
| K |   |   |   |
| N | ● |   |   |
| S |   | ○ |   |
| H | ● | ● | ● |

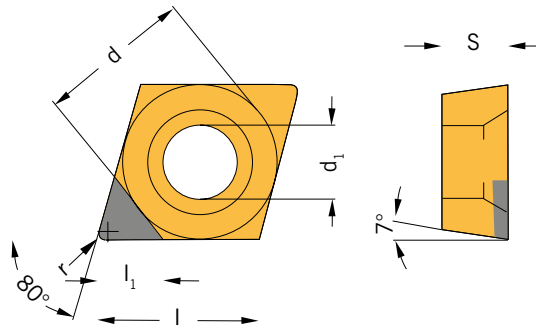
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire



CCGT

Lasered chip breaker / Canale rompitruciolo inciso al laser / Brise-copeaux découpé au laser



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | DU     |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|
|                                    |      |                |       |      |                |     | AN8020 |
| CCGT 060202FN-PFA                  | 6,45 | 3,0            | 6,350 | 2,38 | 2,8            | 0,2 | ◆      |
| CCGT 060204FN-PFA                  | 6,45 | 3,0            | 6,350 | 2,38 | 2,8            | 0,4 | ◆      |
| CCGT 09T302FN-PFA                  | 9,70 | 4,0            | 9,525 | 3,97 | 4,4            | 0,2 | ◆      |
| CCGT 09T304FN-PFA                  | 9,70 | 4,0            | 9,525 | 3,97 | 4,4            | 0,4 | ◆      |
| CCGT 09T308FN-PFA                  | 9,70 | 4,0            | 9,525 | 3,97 | 4,4            | 0,8 | ◆      |
| CCGT 060202FN-PMA                  | 6,45 | 3,0            | 6,350 | 2,38 | 2,8            | 0,2 | ◆      |
| CCGT 060204FN-PMA                  | 6,45 | 3,0            | 6,350 | 2,38 | 2,8            | 0,4 | ◆      |
| CCGT 09T302FN-PMA                  | 9,70 | 4,0            | 9,520 | 3,97 | 4,4            | 0,2 | ◆      |
| CCGT 09T304FN-PMA                  | 9,70 | 4,0            | 9,520 | 3,97 | 4,4            | 0,4 | ◆      |
| CCGT 09T308FN-PMA                  | 9,70 | 4,0            | 9,520 | 3,97 | 4,4            | 0,8 | ◆      |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

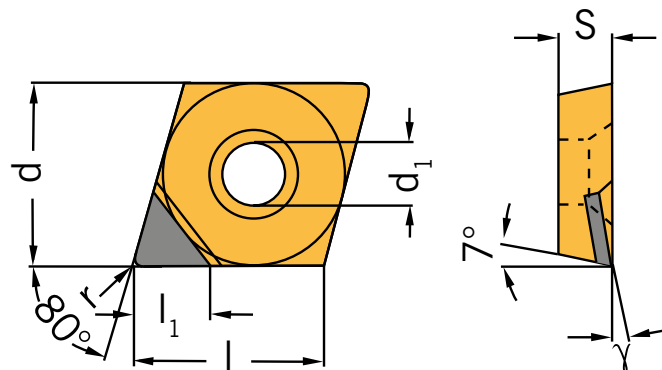
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire



CCGT



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | γ   | DU     |        |
|------------------------------------|-------|----------------|-------|------|----------------|-----|-----|--------|--------|
|                                    |       |                |       |      |                |     |     | AN8020 | AN8025 |
| CCGT 060202FN-MW                   | 6,45  | 3,0            | 6,35  | 2,38 | 2,8            | 0,2 | 7°  | ◆      | ◆      |
| CCGT 060204FN-MW                   | 6,45  | 3,0            | 6,35  | 2,38 | 2,8            | 0,4 | 7°  | ◆      | ◆      |
| CCGT 09T304FN-MW                   | 9,70  | 4,0            | 9,52  | 3,97 | 4,4            | 0,4 | 10° | ◆      | ◆      |
| CCGT 120404FN-MW                   | 12,90 | 4,0            | 12,70 | 4,76 | 5,5            | 0,4 | 10° | ◆      |        |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

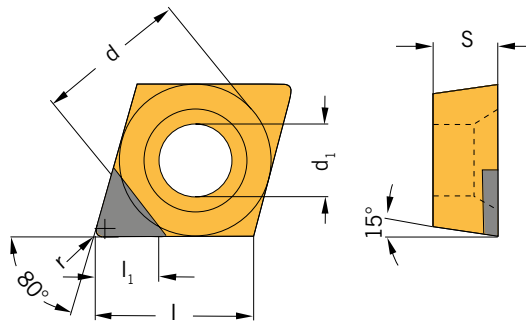
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5



## CDGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s | d <sub>1</sub> | r   | BU       |
|------------------------------------|------|----------------|------|---|----------------|-----|----------|
| CDGW 040102FN-MW                   | 4,03 | 2,0            | 3,97 | 1 | 2,1            | 0,2 | ◆ AH7520 |
| CDGW 040104FN-MW                   | 4,03 | 2,0            | 3,97 | 1 | 2,1            | 0,4 | ◆        |
|                                    |      |                |      |   |                |     |          |
|                                    |      |                |      |   |                |     |          |

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

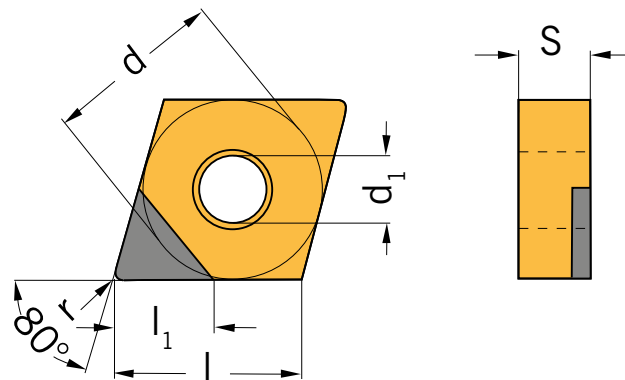
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

# 5

## CNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BU     |        |        |
|------------------------------------|------|----------------|------|------|----------------|-----|--------|--------|--------|
|                                    |      |                |      |      |                |     | AH7510 | AH7516 | AH7520 |
| CNGA 120404FN-EW                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,4 |        |        | ◆      |
| CNGA 120404TN-EW                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,4 | ◆      |        | ◆      |
| CNGA 120408TN-EW                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,8 |        | ◆      | ◆      |
| CNGA 120408FN-MW                   | 12,9 | 4,0            | 12,7 | 4,76 | 5,13           | 0,8 | ◆      |        |        |
| CNGA 120408TN-MW                   | 12,9 | 4,0            | 12,7 | 4,76 | 5,13           | 0,8 | ◆      |        | ◆      |

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

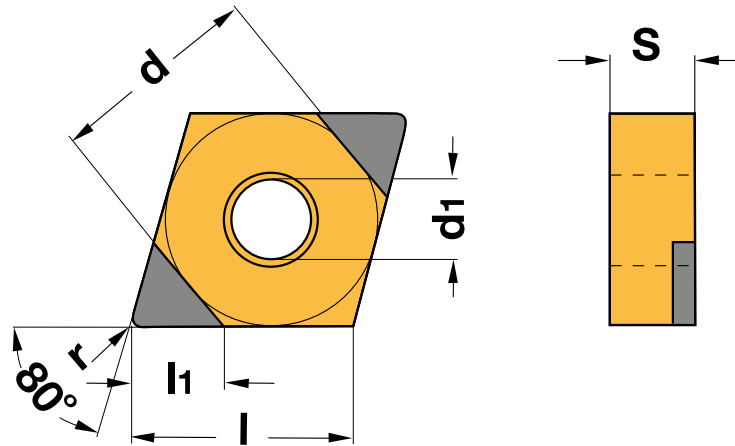
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

5

## CNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BC     |        |        | BU     |        |        |
|------------------------------------|------|----------------|------|------|----------------|-----|--------|--------|--------|--------|--------|--------|
|                                    |      |                |      |      |                |     | AH7810 | AH7815 | AH7820 | AH7510 | AH7516 | AH7520 |
| CNGA 120404TN-AM-2                 | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| CNGA 120408TN-AM-2                 | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,8 | ◆      | ◆      | ◆      |        |        |        |
| CNGA 120412TN-AM-2                 | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 1,2 | ◆      | ◆      | ◆      |        |        |        |
| CNGA 120404TN-MC                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| CNGA 120408TN-MC                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 0,8 |        |        |        | ◆      | ◆      | ◆      |
| CNGA 120412TN-MC                   | 12,9 | 2,5            | 12,7 | 4,76 | 5,13           | 1,2 |        |        |        | ◆      | ◆      | ◆      |

BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

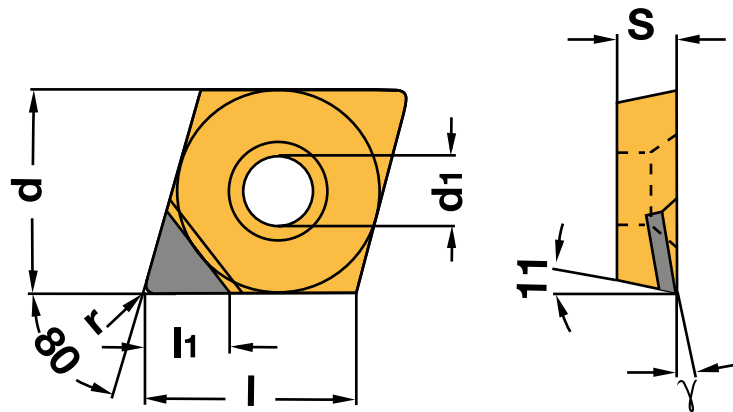
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| S |   |   |   | ○ |   |
| H | ● | ● | ● | ● | ● |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5



CPGT



| Designation<br>Articolo<br>Article | l   | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | γ  | BU     |
|------------------------------------|-----|----------------|------|------|----------------|-----|----|--------|
| CPGT 05T102FN-MW                   | 5,6 | 2,5            | 5,56 | 1,98 | 2,5            | 0,2 | 7° | AH7520 |
|                                    |     |                |      |      |                |     |    | ◆      |
|                                    |     |                |      |      |                |     |    |        |
|                                    |     |                |      |      |                |     |    |        |



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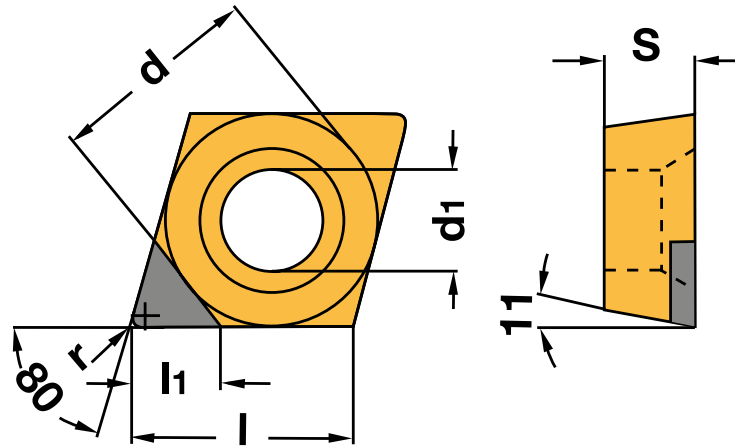
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

CPGW



| Designation<br>Articolo<br>Article | l   | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BU     |        |        |
|------------------------------------|-----|----------------|------|------|----------------|-----|--------|--------|--------|
|                                    |     |                |      |      |                |     | AH7510 | AH7516 | AH7520 |
| CPGW 05T104TN-EW                   | 5,6 | 2,0            | 5,56 | 1,98 | 2,5            | 0,4 |        |        | ◆      |
| CPGW 05T102FN-MW                   | 5,6 | 2,5            | 5,56 | 1,98 | 2,5            | 0,2 | ◆      | ◆      | ◆      |
| CPGW 05T102TN-MW                   | 5,6 | 2,5            | 5,56 | 1,98 | 2,5            | 0,2 | ◆      |        | ◆      |
| CPGW 05T104FN-MW                   | 5,6 | 2,5            | 5,56 | 1,98 | 2,5            | 0,4 | ◆      | ◆      | ◆      |

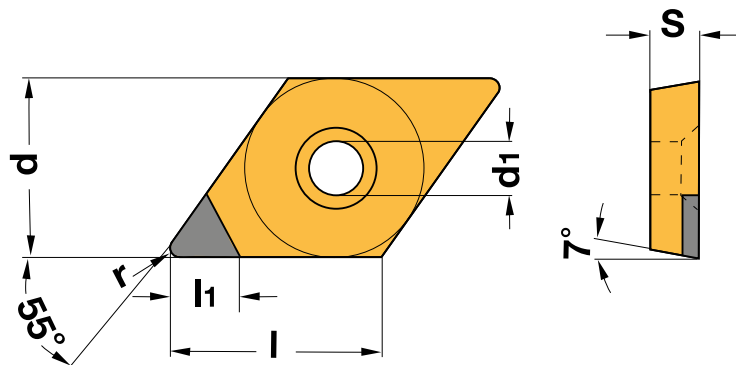
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



## DCGW



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | DU     |        | BU     |        |        |
|------------------------------------|-------|----------------|------|------|----------------|-----|--------|--------|--------|--------|--------|
|                                    |       |                |      |      |                |     | AN8020 | AN8025 | AH7510 | AH7516 | AH7520 |
| DCGW 070204TN-EW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,4 |        |        |        | ◆      |        |
| DCGW 11T302FN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,2 | ◆      |        |        |        | ◆      |
| DCGW 11T302TN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,2 |        |        |        |        | ◆      |
| DCGW 11T304FN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,4 | ◆      |        |        |        | ◆      |
| DCGW 11T304TN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,4 |        |        | ◆      | ◆      | ◆      |
| DCGW 11T308FN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,8 | ◆      |        |        |        | ◆      |
| DCGW 11T308TN-EW                   | 11,60 | 2,5            | 9,52 | 3,97 | 4,4            | 0,8 |        |        | ◆      | ◆      | ◆      |
| DCGW 070202FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,2 | ◆      | ◆      |        |        | ◆      |
| DCGW 070202TN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,2 |        |        |        |        | ◆      |
| DCGW 070204FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,4 | ◆      | ◆      |        |        | ◆      |
| DCGW 070204TN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,4 |        |        |        |        | ◆      |
| DCGW 070208FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,8 | ◆      | ◆      |        |        | ◆      |
| DCGW 11T302FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,2 | ◆      | ◆      |        |        | ◆      |
| DCGW 11T302TN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,2 |        |        | ◆      |        | ◆      |
| DCGW 11T304FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,4 | ◆      | ◆      |        |        | ◆      |
| DCGW 11T304TN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,4 |        |        | ◆      |        | ◆      |
| DCGW 11T308FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,8 | ◆      | ◆      |        |        | ◆      |
| DCGW 11T308TN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,8 |        |        | ◆      |        | ◆      |

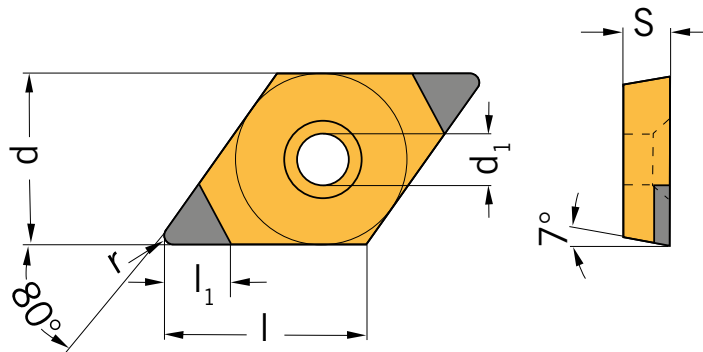
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5

DCGW



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | BC     |        |        | BU     |        |        |
|------------------------------------|-------|----------------|-------|------|----------------|-----|--------|--------|--------|--------|--------|--------|
|                                    |       |                |       |      |                |     | AH7810 | AH7815 | AH7820 | AH7510 | AH7516 | AH7520 |
| DCGW 070202TN-AM-2                 | 7,75  | 2,5            | 6,350 | 2,38 | 2,8            | 0,2 | ◆      | ◆      | ◆      |        |        |        |
| DCGW 070204TN-AM-2                 | 7,75  | 2,5            | 6,350 | 2,38 | 2,8            | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| DCGW 11T304TN-AM-2                 | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| DCGW 11T308TN-AM-2                 | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,8 | ◆      | ◆      | ◆      |        |        |        |
| DCGW 070202TN-MC                   | 7,75  | 2,5            | 6,350 | 2,38 | 2,8            | 0,2 |        |        |        | ◆      | ◆      | ◆      |
| DCGW 070204TN-MC                   | 7,75  | 2,5            | 6,350 | 2,38 | 2,8            | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| DCGW 11T302TN-MC                   | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,2 |        |        |        | ◆      | ◆      | ◆      |
| DCGW 11T304TN-MC                   | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| DCGW 11T308FN-MC                   | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,8 |        |        |        |        |        | ◆      |
| DCGW 11T308TN-MC                   | 11,60 | 2,5            | 9,525 | 3,97 | 4,4            | 0,8 |        |        |        | ◆      | ◆      | ◆      |

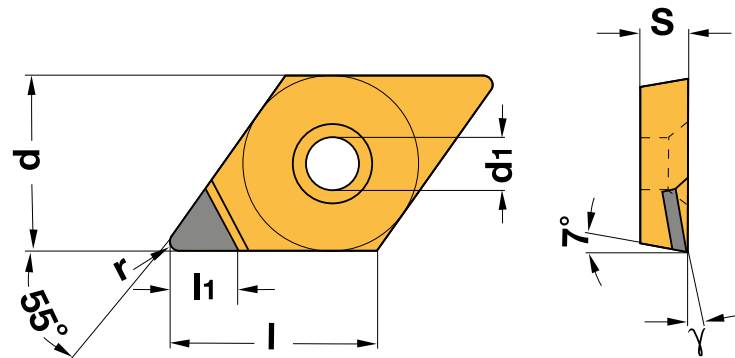
BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



## DCGT



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | γ   | DU     |        |
|------------------------------------|-------|----------------|------|------|----------------|-----|-----|--------|--------|
|                                    |       |                |      |      |                |     |     | AN8020 | AN8025 |
| DCGT 070202FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,2 | 7°  | ◆      | ◆      |
| DCGT 070204FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 4,0 | 7°  | ◆      | ◆      |
| DCGT 070208FN-MW                   | 7,75  | 3,0            | 6,35 | 2,38 | 2,8            | 0,8 | 7°  | ◆      | ◆      |
| DCGT 11T302FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,2 | 10° | ◆      | ◆      |
| DCGT 11T304FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,4 | 10° | ◆      | ◆      |
| DCGT 11T308FN-MW                   | 11,60 | 4,0            | 9,52 | 3,97 | 4,4            | 0,8 | 10° | ◆      | ◆      |



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DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

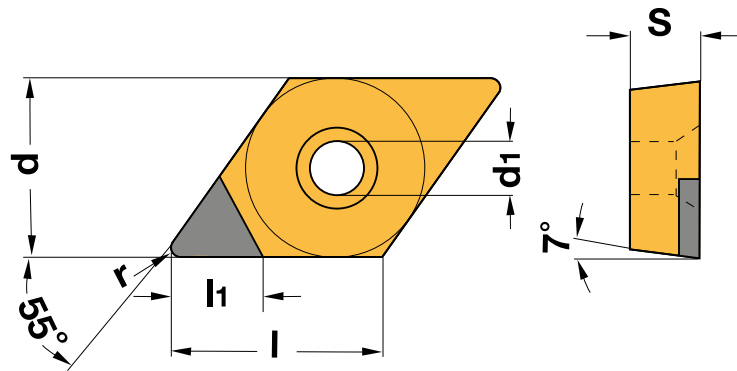
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

**DCGT**

**Lasered chip breaker** / Canale rompitruciolo inciso al laser / Brise-copeaux découpé au laser



| Designation<br>Articolo<br>Article | l     | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | DU     |
|------------------------------------|-------|----------------|-------|------|----------------|-----|--------|
|                                    |       |                |       |      |                |     | AN8020 |
| DCGT 070202FN-PFA                  | 7,75  | 3,0            | 6,350 | 2,38 | 2,8            | 0,2 | ◆      |
| DCGT 070204FN-PFA                  | 7,75  | 3,0            | 6,350 | 2,38 | 2,8            | 0,4 | ◆      |
| DCGT 11T302FN-PFA                  | 11,60 | 4,0            | 9,525 | 3,97 | 4,4            | 0,2 | ◆      |
| DCGT 11T304FN-PFA                  | 11,60 | 4,0            | 9,525 | 3,97 | 4,4            | 0,4 | ◆      |
| DCGT 11T308FN-PFA                  | 11,60 | 4,0            | 9,525 | 3,97 | 4,4            | 0,8 | ◆      |
| DCGT 070202FN-PMA                  | 7,75  | 3,0            | 6,350 | 2,38 | 2,8            | 0,2 | ◆      |
| DCGT 070204FN-PMA                  | 7,75  | 3,0            | 6,350 | 2,38 | 2,8            | 0,4 | ◆      |
| DCGT 11T302FN-PMA                  | 11,60 | 4,0            | 9,520 | 3,97 | 4,4            | 0,2 | ◆      |
| DCGT 11T304FN-PMA                  | 11,60 | 4,0            | 9,520 | 3,97 | 4,4            | 0,4 | ◆      |
| DCGT 11T308FN-PMA                  | 11,60 | 4,0            | 9,520 | 3,97 | 4,4            | 0,8 | ◆      |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

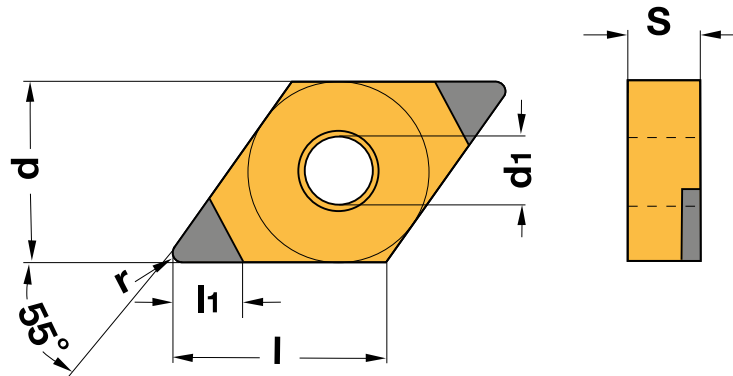
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

5

DNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BC     |        |        | BU     |        |        |
|------------------------------------|------|----------------|------|------|----------------|-----|--------|--------|--------|--------|--------|--------|
|                                    |      |                |      |      |                |     | AH7810 | AH7815 | AH7820 | AH7510 | AH7516 | AH7520 |
| DNGA 150604TN-AM-2                 | 15,5 | 2,5            | 12,7 | 6,35 | 5,13           | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| DNGA 150608TN-AM-2                 | 15,5 | 2,5            | 12,7 | 6,35 | 5,13           | 0,8 | ◆      | ◆      | ◆      |        |        |        |
| DNGA 150612TN-AM-2                 | 15,5 | 2,5            | 12,7 | 6,35 | 5,13           | 1,2 | ◆      | ◆      | ◆      |        |        |        |
|                                    |      |                |      |      |                |     |        |        |        |        |        |        |
| DNGA 150604TN-MC                   | 15,5 | 2,5            | 12,7 | 6,35 | 5,10           | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| DNGA 150608TN-MC                   | 15,5 | 2,5            | 12,7 | 6,35 | 5,10           | 0,8 |        |        |        | ◆      | ◆      | ◆      |
|                                    |      |                |      |      |                |     |        |        |        |        |        |        |



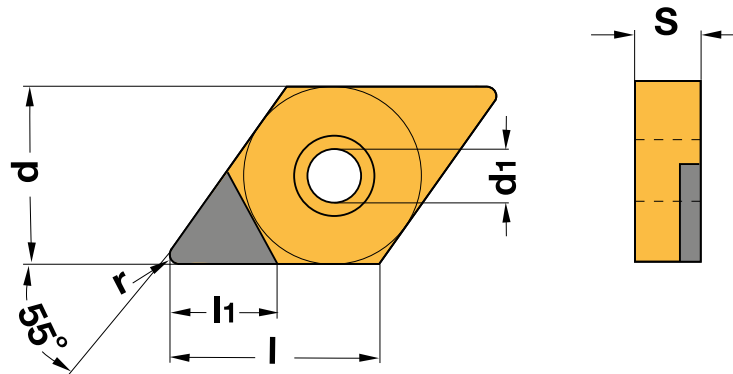
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BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

DNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BU<br>AH7520 |
|------------------------------------|------|----------------|------|------|----------------|-----|--------------|
| DNGA 150608TN-EW                   | 15,5 | 2,5            | 12,7 | 6,35 | 5,13           | 0,8 | ◆            |
|                                    |      |                |      |      |                |     |              |
| DNGA 150612TN-MW                   | 15,5 | 4,0            | 12,7 | 6,35 | 5,13           | 1,2 | ◆            |
|                                    |      |                |      |      |                |     |              |
|                                    |      |                |      |      |                |     |              |

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

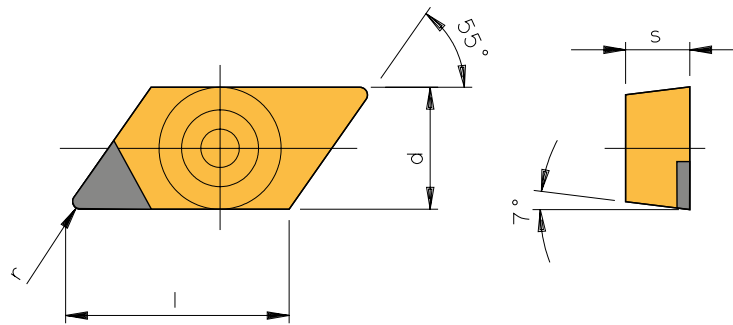
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5



## KCGX



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | r   | DU     | BU     |
|------------------------------------|------|----------------|------|------|-----|--------|--------|
|                                    |      |                |      |      |     | AN8020 | AH7520 |
| KCGX 110302FL-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,2 |        | ◆      |
| KCGX 110302FR-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,2 | ◆      | ◆      |
| KCGX 110302TL-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,2 |        | ◆      |
| KCGX 110302TR-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,2 |        | ◆      |
| KCGX 110304FL-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,4 | ◆      | ◆      |
| KCGX 110304FR-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,4 |        | ◆      |
| KCGX 110304TL-MW                   | 11,6 | 4,0            | 6,35 | 3,18 | 0,4 |        | ◆      |

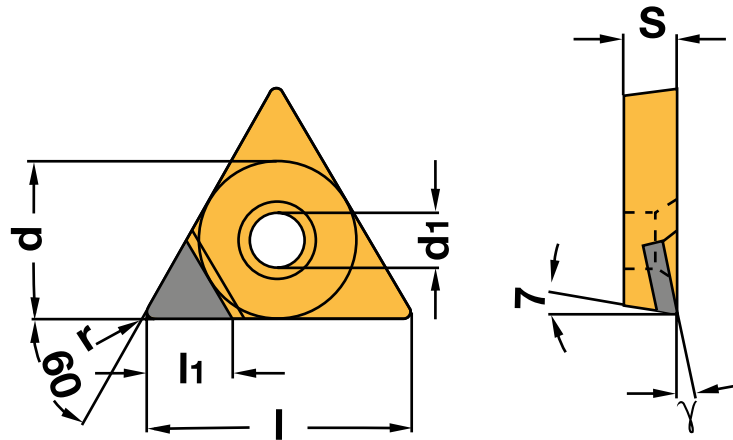
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5

## TCGT



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | γ   | DU     |
|------------------------------------|------|----------------|-------|------|----------------|-----|-----|--------|
| TCGT 16T304FN-MW                   | 16,5 | 4,0            | 9,525 | 3,97 | 4,4            | 0,4 | 10° | AN8020 |
|                                    |      |                |       |      |                |     |     | ◆      |
|                                    |      |                |       |      |                |     |     |        |
|                                    |      |                |       |      |                |     |     |        |



DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

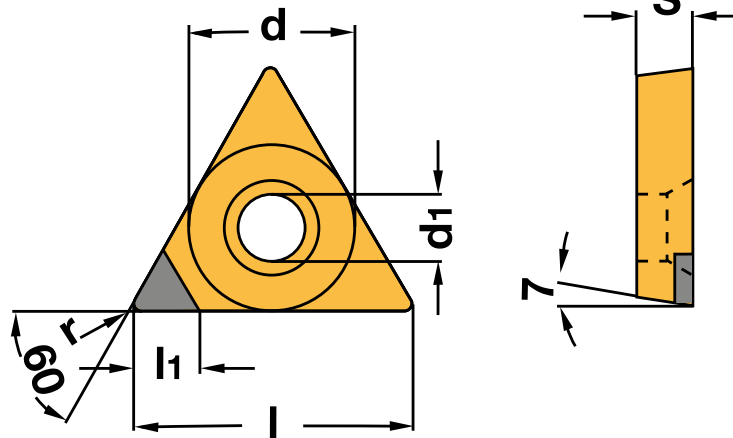
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

5

## TCGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | DU<br>AN8020 | BU<br>AH7520 |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------------|--------------|
| TCGW 090202FN-MW                   | 9,6  | 3,0            | 5,560 | 2,38 | 2,5            | 0,2 | ◆            |              |
| TCGW 090204FN-MW                   | 9,6  | 3,0            | 5,560 | 2,38 | 2,5            | 0,4 | ◆            |              |
| TCGW 16T304FN-MW                   | 16,5 | 4,0            | 9,525 | 3,97 | 4,4            | 0,4 | ◆            |              |
| TCGW 16T308FN-MW                   | 16,5 | 4,0            | 9,525 | 3,97 | 4,4            | 0,8 | ◆            |              |
| TCGW 110202FN-MW                   | 11,0 | 4,0            | 6,350 | 2,38 | 2,8            | 0,2 | ◆            |              |
| TCGW 110204FN-MW                   | 11,0 | 4,0            | 6,350 | 2,38 | 2,8            | 0,4 | ◆            | ◆            |

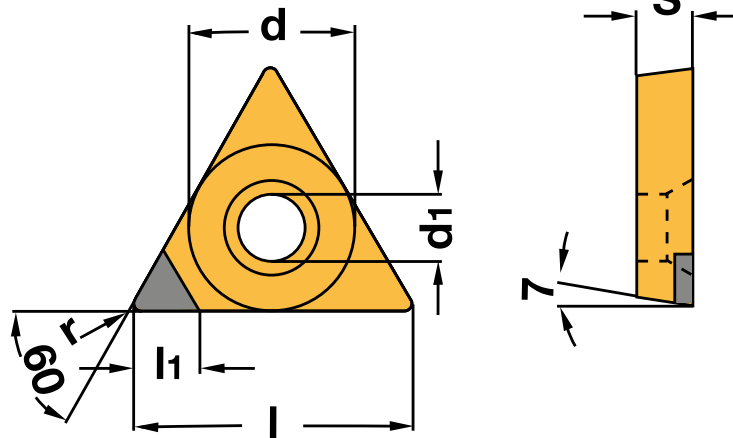
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5

TCGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | DU     | BU     |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|--------|
| TCGW 16T304FN-EW                   | 16,5 | 2,5            | 9,525 | 3,97 | 4,4            | 0,4 | AN8020 | AH7520 |
| TCGW 110204TN-EW                   | 11,0 | 2,5            | 6,350 | 2,38 | 2,8            | 0,4 |        |        |
|                                    |      |                |       |      |                |     |        |        |
|                                    |      |                |       |      |                |     |        |        |

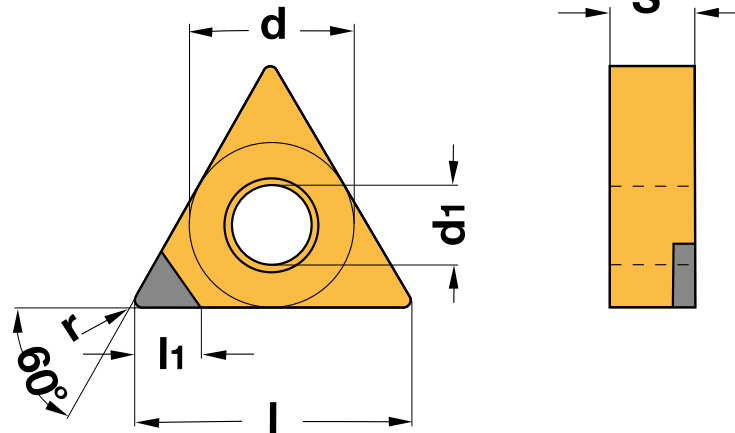
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
 BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



TNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | BU     |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|
| TNGA 160404TN-EW                   | 16,5 | 2,5            | 9,525 | 4,76 | 3,81           | 0,4 | AH7520 |
|                                    |      |                |       |      |                |     | ◆      |
|                                    |      |                |       |      |                |     |        |
|                                    |      |                |       |      |                |     |        |



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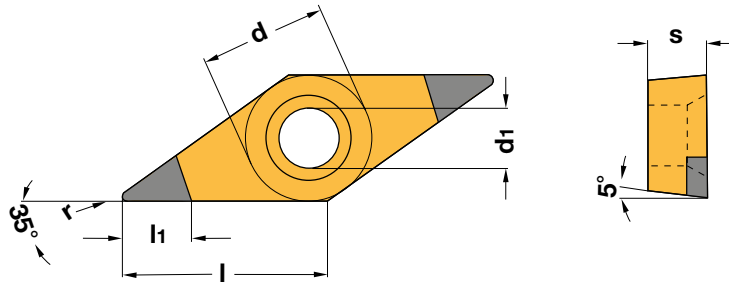
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## VBGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | BC     |        |        |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|--------|--------|
|                                    |      |                |       |      |                |     | AH7810 | AH7815 | AH7820 |
| <b>VBGW 160404TN-AM-2</b>          | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 | ◆      | ◆      | ◆      |
| <b>VBGW 160408TN-AM-2</b>          | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,8 | ◆      | ◆      | ◆      |
|                                    |      |                |       |      |                |     |        |        |        |
|                                    |      |                |       |      |                |     |        |        |        |

BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement

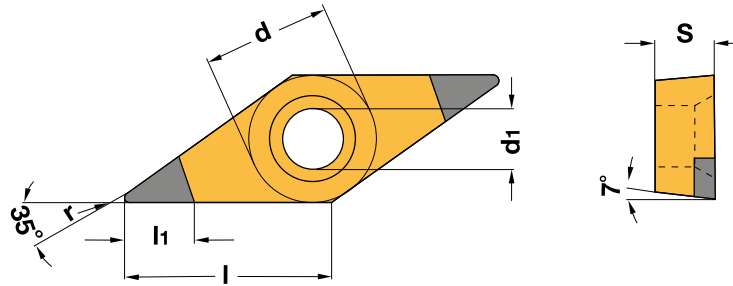
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

5

VCGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | DU     | BU     |
|------------------------------------|------|----------------|------|------|----------------|-----|--------|--------|
|                                    |      |                |      |      |                |     | AN8020 | AN8025 |
| VCGW 110302FN-MW                   | 11,1 | 3,7            | 6,35 | 3,18 | 2,9            | 0,2 | ◆      | ◆      |
|                                    |      |                |      |      |                |     |        |        |
|                                    |      |                |      |      |                |     |        |        |
|                                    |      |                |      |      |                |     |        |        |



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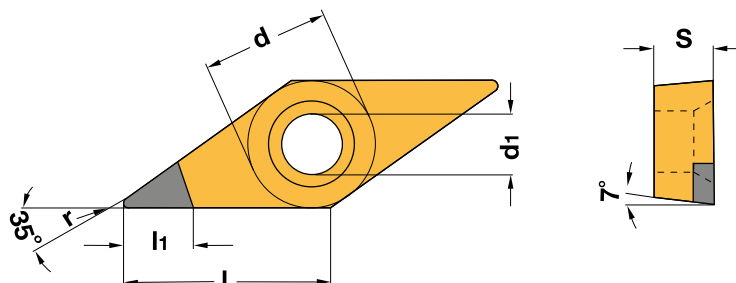
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

VCGT

Lasered chip breaker (PFA / PMA) / Canale rompitruciolo inciso al laser (PFA / PMA) / Brise-copeaux découpé au laser (PFA / PMA)



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d      | s    | d <sub>1</sub> | r   | DU     |        |
|------------------------------------|------|----------------|--------|------|----------------|-----|--------|--------|
|                                    |      |                |        |      |                |     | AN8020 | AN8025 |
| VCGT 220530FN-IWC                  | 15,6 | 7,0            | 12,700 | 5,56 | 5,5            | 3,0 | ◆      |        |
| VCGT 070202FN-MW                   | 6,9  | 3,7            | 3,970  | 2,38 | 2,2            | 0,2 | ◆      |        |
| VCGT 070204FN-MW                   | 6,9  | 3,7            | 3,970  | 2,38 | 2,2            | 0,4 | ◆      |        |
| VCGT 110302FN-MW                   | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,2 | ◆      | ◆      |
| VCGT 110304FN-MW                   | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,4 | ◆      | ◆      |
| VCGT 160402FN-MW                   | 16,6 | 0,0            | 9,525  | 4,76 | 4,4            | 0,2 | ◆      | ◆      |
| VCGT 160404FN-MW                   | 16,6 | 4,5            | 9,525  | 4,76 | 4,4            | 0,4 | ◆      | ◆      |
| VCGT 160408FN-MW                   | 16,6 | 4,5            | 9,525  | 4,76 | 4,4            | 0,8 | ◆      | ◆      |
| VCGT 110302FN-PFA                  | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,2 | ◆      |        |
| VCGT 110304FN-PFA                  | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,4 | ◆      |        |
| VCGT 160402FN-PFA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,2 | ◆      |        |
| VCGT 160404FN-PFA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,4 | ◆      |        |
| VCGT 160408FN-PFA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,8 | ◆      |        |
| VCGT 110302FN-PMA                  | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,2 | ◆      |        |
| VCGT 110304FN-PMA                  | 11,1 | 3,7            | 6,350  | 3,18 | 2,9            | 0,4 | ◆      |        |
| VCGT 160402FN-PMA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,2 | ◆      |        |
| VCGT 160404FN-PMA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,4 | ◆      |        |
| VCGT 160408FN-PMA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 0,8 | ◆      |        |
| VCGT 160412FN-PMA                  | 16,6 | 4,5            | 9,520  | 4,76 | 4,4            | 1,2 | ◆      |        |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

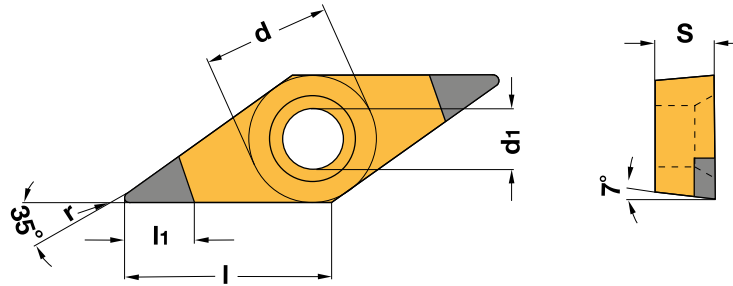
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire





## VCGW



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | BC     |        |        | BU     |        |        |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|--------|--------|--------|--------|--------|
|                                    |      |                |       |      |                |     | AH7810 | AH7815 | AH7820 | AH7510 | AH7516 | AH7520 |
| VCGW 110302TN-AM-2                 | 11,1 | 3,0            | 6,350 | 3,18 | 2,9            | 0,2 | ◆      | ◆      | ◆      |        |        |        |
| VCGW 110304TN-AM-2                 | 11,1 | 3,0            | 6,350 | 3,18 | 2,9            | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| VCGW 160404TN-AM-2                 | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 | ◆      | ◆      | ◆      |        |        |        |
| VCGW 160408TN-AM-2                 | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,8 | ◆      | ◆      | ◆      |        |        |        |
| VCGW 110302TN-MC                   | 11,1 | 3,0            | 6,350 | 3,18 | 2,9            | 0,2 |        |        |        | ◆      | ◆      | ◆      |
| VCGW 110304TN-MC                   | 11,1 | 3,0            | 6,350 | 3,18 | 2,9            | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| VCGW 160402TN-MC                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,2 |        |        |        | ◆      | ◆      | ◆      |
| VCGW 160404FN-MC                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 |        |        |        | ◆      |        | ◆      |
| VCGW 160404TN-MC                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 |        |        |        | ◆      | ◆      | ◆      |
| VCGW 160408TN-MC                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,8 |        |        |        | ◆      | ◆      | ◆      |

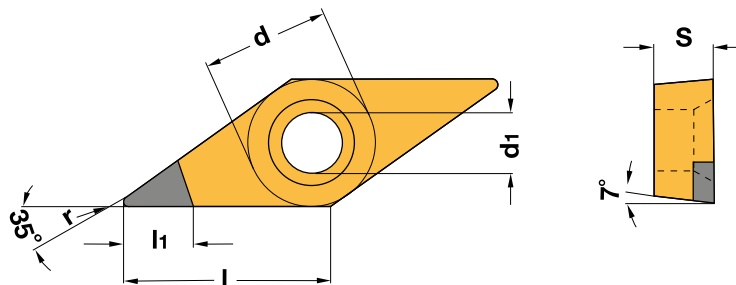
BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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| H | ● | ● | ● | ● | ● | ● |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5

## VCGW



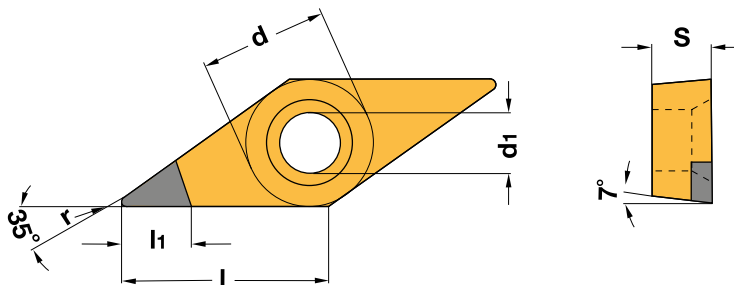
| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | DU     |        | BU     |        |        |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|--------|--------|--------|--------|
|                                    |      |                |       |      |                |     | AN8020 | AN8025 | AH7510 | AH7516 | AH7520 |
| VCGW 160404FN-EW                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 | ◆      |        |        |        |        |
| VCGW 160404TN-EW                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,4 |        |        | ◆      | ◆      |        |
| VCGW 160408FN-EW                   | 16,6 | 3,0            | 9,525 | 4,76 | 4,4            | 0,8 |        |        |        |        | ◆      |
| VCGW 070202FN-MW                   | 6,9  | 3,7            | 3,970 | 2,38 | 2,2            | 0,2 | ◆      |        | ◆      |        | ◆      |
| VCGW 070204FN-MW                   | 6,9  | 3,7            | 3,970 | 2,38 | 2,2            | 0,4 |        |        |        |        | ◆      |
| VCGW 110302FN-MW                   | 11,1 | 3,7            | 6,350 | 3,18 | 2,9            | 0,2 | ◆      | ◆      |        |        | ◆      |
| VCGW 110302TN-MW                   | 11,1 | 3,7            | 6,350 | 3,18 | 2,9            | 0,2 |        |        |        |        | ◆      |
| VCGW 110304FN-MW                   | 11,1 | 3,7            | 6,350 | 3,18 | 2,9            | 0,4 | ◆      | ◆      | ◆      |        | ◆      |
| VCGW 110304TN-MW                   | 11,1 | 3,7            | 6,350 | 3,18 | 2,9            | 0,4 |        |        | ◆      |        | ◆      |
| VCGW 110308FN-MW                   | 11,1 | 3,7            | 6,350 | 3,18 | 2,9            | 0,8 | ◆      | ◆      |        |        | ◆      |
| VCGW 160402FN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 0,2 | ◆      | ◆      |        |        | ◆      |
| VCGW 160404FN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 0,4 | ◆      | ◆      |        |        | ◆      |
| VCGW 160404TN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 0,4 |        |        |        |        | ◆      |
| VCGW 160408FN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 0,8 | ◆      | ◆      |        |        | ◆      |
| VCGW 160408TN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 0,8 | ◆      |        |        |        | ◆      |
| VCGW 160412FN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 1,2 | ◆      |        |        |        |        |
| VCGW 160412TN-MW                   | 16,6 | 4,5            | 9,525 | 4,76 | 4,4            | 1,2 | ◆      |        |        |        |        |

DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement  
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

|   |   |       |
|---|---|-------|
| P |   |       |
| M |   |       |
| K |   |       |
| N | ● | ●     |
| S |   | ○     |
| H |   | ● ● ● |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

VPGT



| Designation              | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | DU     |
|--------------------------|------|----------------|------|------|----------------|-----|--------|
| Articolo                 |      |                |      |      |                |     | AN8020 |
| Article                  |      |                |      |      |                |     | ◆      |
| <b>VPGT 220516FN-IWC</b> | 18,7 | 4,5            | 12,7 | 5,56 | 5,5            | 1,6 |        |
|                          |      |                |      |      |                |     |        |
|                          |      |                |      |      |                |     |        |
|                          |      |                |      |      |                |     |        |



5

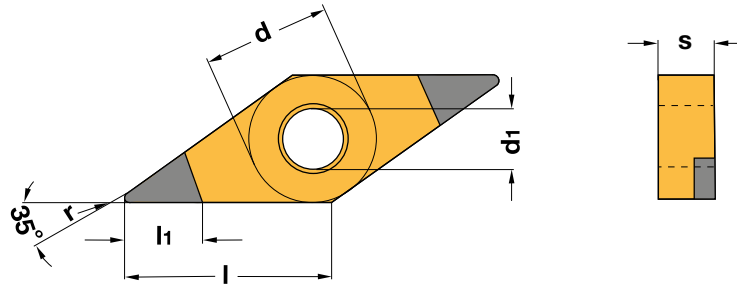
DU = PKD super hard cutting materials uncoated / Materiali da taglio extra duri PKD non rivestiti / Matériaux de coupe ultra-durs PCD sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N | ● |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## VNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d     | s    | d <sub>1</sub> | r   | BC     |        |        |
|------------------------------------|------|----------------|-------|------|----------------|-----|--------|--------|--------|
|                                    |      |                |       |      |                |     | AH7810 | AH7815 | AH7820 |
| VNGA 160402TN-AM-2                 | 16,6 | 3,0            | 9,525 | 4,76 | 3,81           | 0,2 | ◆      | ◆      | ◆      |
| VNGA 160404TN-AM-2                 | 16,6 | 3,0            | 9,525 | 4,76 | 3,81           | 0,4 | ◆      | ◆      | ◆      |
| VNGA 160408TN-AM-2                 | 16,6 | 3,0            | 9,525 | 4,76 | 3,81           | 0,8 | ◆      | ◆      | ◆      |

BC = CBN super hard cutting materials / Materiali da taglio extra duri CBN rivestiti / Matériaux de coupe ultra-durs CBN avec revêtement

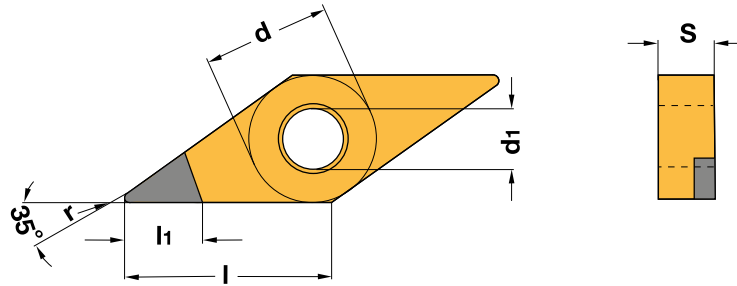
|   |       |
|---|-------|
| P |       |
| M |       |
| K |       |
| N |       |
| S |       |
| H | ● ● ● |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

5

VNGA



| Designation<br>Articolo<br>Article | l    | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BU     |
|------------------------------------|------|----------------|------|------|----------------|-----|--------|
| VNGA 160402TN-MW                   | 16,6 | 4,5            | 9,52 | 4,76 | 3,81           | 0,2 | AH7520 |
|                                    |      |                |      |      |                |     | ◆      |
|                                    |      |                |      |      |                |     |        |
|                                    |      |                |      |      |                |     |        |



5

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

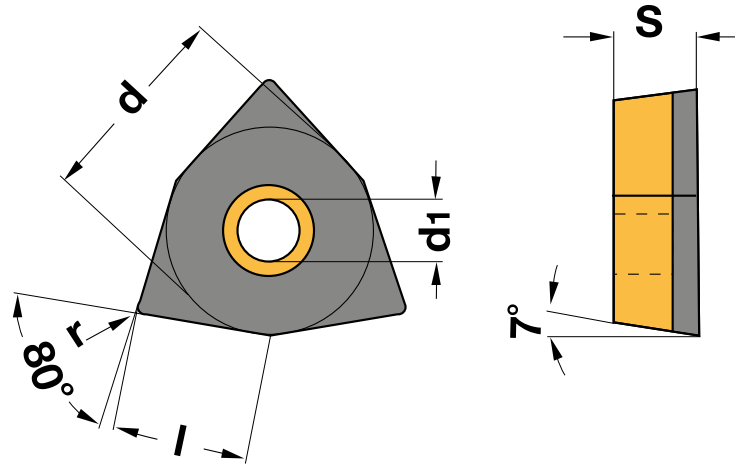
|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## WCGW

Full face



| Designation<br>Articolo<br>Article | l   | d    | s    | d <sub>1</sub> | r   | BU<br>AH7520 |
|------------------------------------|-----|------|------|----------------|-----|--------------|
| WCGW 020102FN-MW                   | 2,7 | 3,97 | 1,58 | 2,3            | 0,2 | ◆            |
| WCGW 020102TN-MW                   | 2,7 | 3,97 | 1,58 | 2,3            | 0,2 | ◆            |



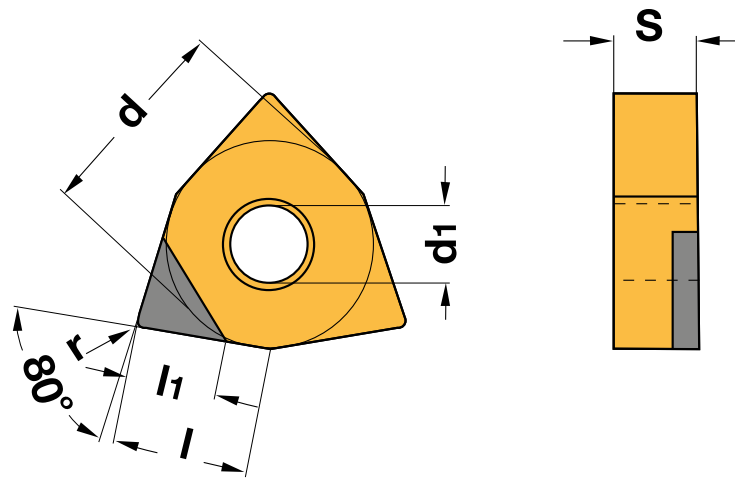
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

5

WNGA



| Designation<br>Articolo<br>Article | l   | l <sub>1</sub> | d    | s    | d <sub>1</sub> | r   | BU     |
|------------------------------------|-----|----------------|------|------|----------------|-----|--------|
| WNGA 080408TN-MW                   | 8,5 | 4,0            | 12,7 | 4,76 | 5,13           | 0,8 | AH7520 |
|                                    |     |                |      |      |                |     | ◆      |
|                                    |     |                |      |      |                |     |        |
|                                    |     |                |      |      |                |     |        |



5

BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

|   |   |
|---|---|
| P |   |
| M |   |
| K |   |
| N |   |
| S |   |
| H | ● |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

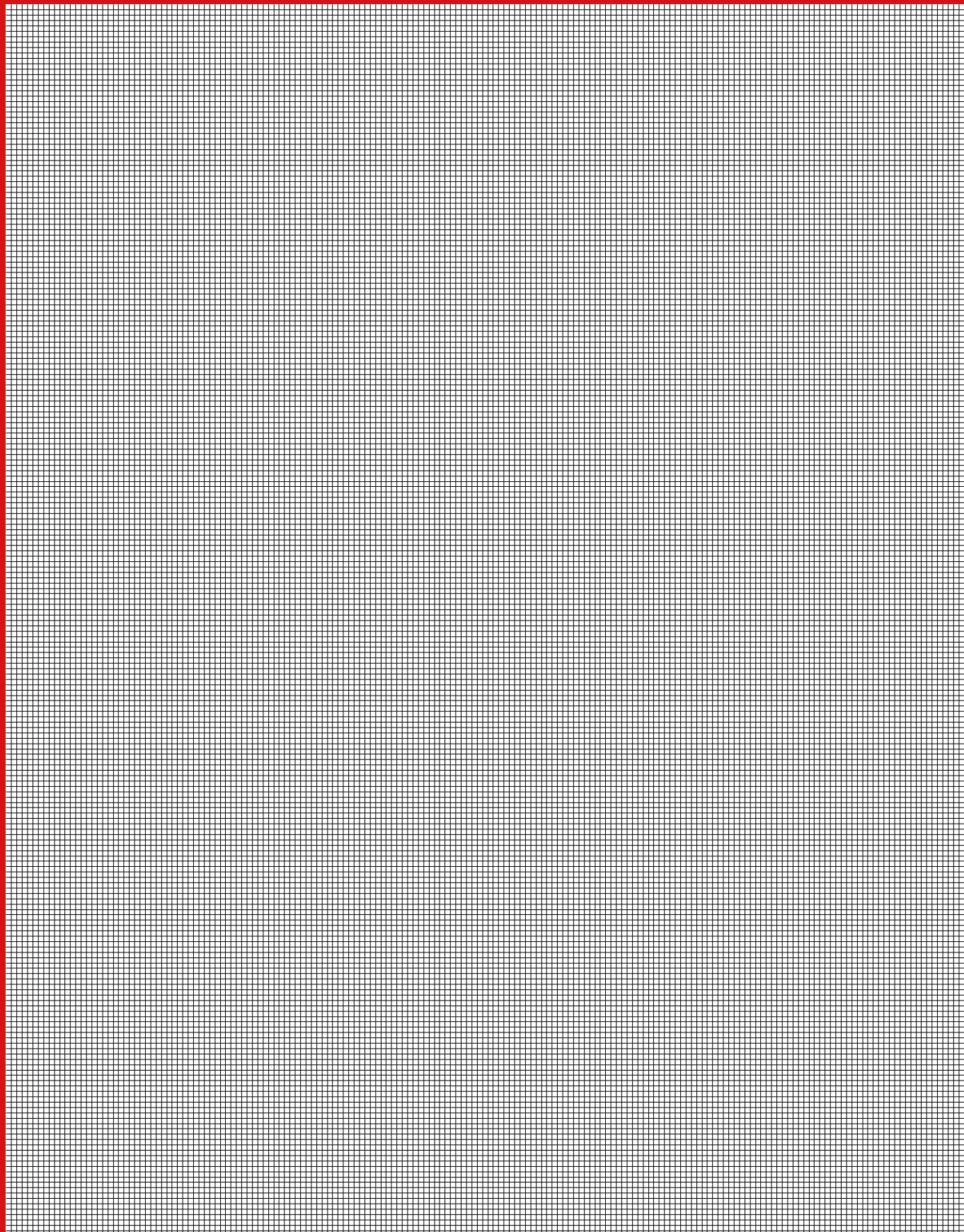
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| Material group | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                |                 |
|----------------|---|---|---------------------|--|----------------|--------------------------|----------------|-----------------|
|                |   |   |                     |  |                | BC                       |                |                 |
|                |   |   |                     |  |                | AH7810                   | AH7815         | AH7820          |
| <b>P</b>       | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | -                        | -              | -               |
|                |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | -                        | -              | -               |
|                |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | -                        | -              | -               |
|                |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | -                        | -              | -               |
|                |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | -                        | -              | -               |
|                |   | Machining steel (short-chipping) annealed       | 220                 | 745                                      | P6             | -                        | -              | -               |
|                | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | -                        | -              | -               |
|                |   | hardened and tempered                           | 300                 | 1013                                     | P8             | -                        | -              | -               |
|                |   | hardened and tempered                           | 380                 | 1282                                     | P9             | -                        | -              | -               |
|                |   | hardened and tempered                           | 430                 | 1477                                     | P10            | -                        | -              | -               |
|                | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | -                        | -              | -               |
|                |   | hardened  | 300                 | 1013                                     | P12            | -                        | -              | -               |
|                |   | hardened  | 400                 | 1361                                     | P13            | -                        | -              | -               |
|                | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | -                        | -              | -               |
|                |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | -                        | -              | -               |
| <b>M</b>       | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | -                        | -              | -               |
|                |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | -                        | -              | -               |
|                |   | austenitic-ferretic, Duplex                     | 230                 | 778                                      | M3             | -                        | -              | -               |
| <b>K</b>       | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | -                        | -              | -               |
|                |   | pearlitic                                       | 260                 | 867                                      | K2             | -                        | -              | -               |
| <b>K</b>       | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | -                        | -              | -               |
|                |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | -                        | -              | -               |
|                | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | -                        | -              | -               |
|                |   | pearlitic                                       | 265                 | 885                                      | K6             | -                        | -              | -               |
| GGV (CGI)      |   | 200   | 675                 | K7                                       | -              | -                        | -              |                 |
| <b>N</b>       | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | -                        | -              | -               |
|                |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | -                        | -              | -               |
|                | Casted aluminium alloys                                     | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | -                        | -              | -               |
|                |   | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | -                        | -              | -               |
|                |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | -                        | -              | -               |
|                | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -              | -               |
|                |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | -                        | -              | -               |
|                | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | -                        | -              | -               |
|                |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | -                        | -              | -               |
|                |   | High-tensile, Ampco                             | 300                 | 1013                                     | N10            | -                        | -              | -               |
|                |   | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -              | -               |
|                | Non-ferrous materials                                       | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -              | -               |
|                |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -              | -               |
|                |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -              | -               |
|                |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -              | -               |
|                |   | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -              | -               |
| <b>S</b>       | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | -                        | -              | -               |
|                |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | -                        | -              | -               |
|                |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | -                        | -              | -               |
|                |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | -                        | -              | -               |
|                |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | -              | -               |
|                | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -              | -               |
|                |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -              | -               |
|                |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -              | -               |
|                | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -              | -               |
|                | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -              | -               |
| <b>H</b>       | Hardened steel  | hardened  | 50 HRC              | -  | H1             | 90 - 180 - 270           | 40 - 120 - 200 | 100 - 145 - 190 |
|                |   | hardened  | 55 HRC              | -  | H2             | 90 - 180 - 270           | 40 - 120 - 200 | 100 - 145 - 190 |
|                |   | hardened  | 60 HRC              | -  | H3             | 90 - 180 - 270           | 40 - 120 - 200 | 100 - 145 - 190 |
|                | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | 90 - 180 - 270           | 40 - 120 - 200 | 100 - 145 - 190 |

The recommended cutting data are only approximate values.  
 It may be necessary to adjust them to each individual machining application.  
 DU = PKD super hard cutting materials uncoated  
 BC = CBN super hard cutting materials  
 BU = CBN super hard cutting materials uncoated

5



| Gruppo materiale                       | Struttura dei gruppi di materiali e lettere di riferimento |  | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                |                 |
|--|--|--|-----------------|------------------------------------|------------------|-------------------------------|----------------|-----------------|
|  |  |  |                 |                                    |                  | BC                            |                |                 |
|  |  |  |                 |                                    |                  | AH7810                        | AH7815         | AH7820          |
| <b>P</b>                               | Acciai non legato  | C ≤ 0,25 % ricotto                               | 125             | 428                                | P1               | -                             | -              | -               |
|  |  | C >= 0,25 ... >= 0,55 % ricotto                  | 190             | 639                                | P2               | -                             | -              | -               |
|  |  | C >= 0,25 ... >= 0,55 % bonificato               | 210             | 708                                | P3               | -                             | -              | -               |
|  |  | C ≤ 0,55 % ricotto                               | 190             | 639                                | P4               | -                             | -              | -               |
|  |  | C ≤ 0,55 % bonificato                            | 300             | 1013                               | P5               | -                             | -              | -               |
|  |  | Acciaio (truciolo corto) ricotto                 | 220             | 745                                | P6               | -                             | -              | -               |
|  | Acciai debolmente legati                                   | ricotto  | 175             | 591                                | P7               | -                             | -              | -               |
|  |  | bonificato                                       | 300             | 1013                               | P8               | -                             | -              | -               |
|  |  | bonificato                                       | 380             | 1282                               | P9               | -                             | -              | -               |
|  |  | bonificato                                       | 430             | 1477                               | P10              | -                             | -              | -               |
|  | Acciai fortemente legati e acciai da utensili              | ricotto  | 200             | 675                                | P11              | -                             | -              | -               |
|  |  | temprato e rinvenuto                             | 300             | 1013                               | P12              | -                             | -              | -               |
|  |  | temprato e rinvenuto                             | 400             | 1361                               | P13              | -                             | -              | -               |
|  | Acciai inossidabili  | ferritico / martensitico, ricotto                | 200             | 675                                | P14              | -                             | -              | -               |
|  |  | martensitico, bonificato                         | 330             | 1114                               | P15              | -                             | -              | -               |
| austenitico, trattato o temperato      |  | 200  | 675             | M1                                 | -                | -                             | -              |                 |
| <b>M</b>                               | Acciai inossidabili  | austenitico, indurimento per precipitazione (PH) | 300             | 1013                               | M2               | -                             | -              | -               |
|  |  | austenitico-ferritico, Duplex                    | 230             | 778                                | M3               | -                             | -              | -               |
|  |  | ferritico  | 200             | 675                                | K1               | -                             | -              | -               |
| <b>K</b>                               | Ghisa temprata   | perlitica  | 260             | 867                                | K2               | -                             | -              | -               |
|  |  | bassa resistenza                                 | 180             | 602                                | K3               | -                             | -              | -               |
|  | Ghisa grigia   | alta resistenza / austenitico                    | 245             | 825                                | K4               | -                             | -              | -               |
|  |  | ferritico  | 155             | 518                                | K5               | -                             | -              | -               |
| <b>N</b>                               | Ghisa sferoidale   | perlitica  | 265             | 885                                | K6               | -                             | -              | -               |
|  |  | GGV (CGI)  | 200             | 675                                | K7               | -                             | -              | -               |
|  |  | Leghe di Alluminio stampato                      | non invecchiato | 30                                 | -                | N1                            | -              | -               |
| rinvenuto, invecchiato                 | 100  |  | 343             | N2                                 | -                | -                             | -              |                 |
| ≤ 12 % Si, non invecchiato             | 75   |  | 260             | N3                                 | -                | -                             | -              |                 |
| ≤ 12 % Si, rinvenuto, invecchiato      | 90   |  | 314             | N4                                 | -                | -                             | -              |                 |
| > 12 % Si, non invecchiato             | 130  |  | 447             | N5                                 | -                | -                             | -              |                 |
| > 12 % Si, non invecchiato             | 70   |  | 250             | N6                                 | -                | -                             | -              |                 |
| Rame e Leghe di Rame (Bronzo / Ottone) | Non Legati, Rame Elettrolitico                             |  | 100             | 343                                | N7               | -                             | -              | -               |
|  | Ottone, Bronzo   |  | 90              | 314                                | N8               | -                             | -              | -               |
|  | Leghe Cu, truciolo corto                                   |  | 110             | 382                                | N9               | -                             | -              | -               |
|  | Alta resistenza, Ampco                                     |  | 300             | 1013                               | N10              | -                             | -              | -               |
| Materiali non metallici                | Leghe al piombo (senza materiale di riempimento abrasivo)  | -  | -               | N11                                | -                | -                             | -              |                 |
|  | Duroplastico (senza materiale di riempimento abrasivo)     | -  | -               | N12                                | -                | -                             | -              |                 |
|  | Plastica rinforzata in fibra di vetro CFRP                 | -  | -               | N13                                | -                | -                             | -              |                 |
|  | Plastica rinforzata in fibra di carbonio CFRP              | -  | -               | N14                                | -                | -                             | -              |                 |
|  | Plastica rinforzata in fibra aramidica AFRP                | -  | -               | N15                                | -                | -                             | -              |                 |
|  | Grafite (tecnico)  | 80 Shore   | -               | N16                                | -                | -                             | -              |                 |
| <b>S</b>                               | Leghe resistenti al calore                                 | Base-Fe ricotto                                  | 200             | 675                                | S1               | -                             | -              | -               |
|  |  | Base-Fe invecchiato                              | 280             | 943                                | S2               | -                             | -              | -               |
|  |  | Base Ni o Co ricotto                             | 250             | 839                                | S3               | -                             | -              | -               |
|  |  | Base Ni o Co invecchiato                         | 350             | 1177                               | S4               | -                             | -              | -               |
|  |  | Base Ni o Co da fusione                          | 320             | 1076                               | S5               | -                             | -              | -               |
|  | Leghe di Titanio   | Titanio puro                                     | 200             | 675                                | S6               | -                             | -              | -               |
|  |  | Leghe α e β, invecchiato                         | 375             | 1262                               | S7               | -                             | -              | -               |
|  |  | Leghe β  | 410             | 1396                               | S8               | -                             | -              | -               |
|  | Leghe di tungsteno   | 300  | 1013            | S9                                 | -                | -                             | -              |                 |
|  | Leghe di molibdeno   | 300  | 1013            | S10                                | -                | -                             | -              |                 |
| <b>H</b>                               | Acciaio Temprato   | temprato e rinvenuto                             | 50 HRC          | -                                  | H1               | 90 - 180 - 270                | 40 - 120 - 200 | 100 - 145 - 190 |
|  |  | temprato e rinvenuto                             | 55 HRC          | -                                  | H2               | 90 - 180 - 270                | 40 - 120 - 200 | 100 - 145 - 190 |
|  |  | temprato e rinvenuto                             | 60 HRC          | -                                  | H3               | 90 - 180 - 270                | 40 - 120 - 200 | 100 - 145 - 190 |
|  | Ghisa Temprata   | temprato e rinvenuto                             | 55 HRC          | -                                  | H4               | 90 - 180 - 270                | 40 - 120 - 200 | 100 - 145 - 190 |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

DU = Materiali da taglio extra duri PKD non rivestiti

BC = Materiali da taglio extra duri CBN rivestiti

BU = materiali da taglio extra duri CBN non rivestiti



| Groupe de matériaux                            | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                |                 |
|--|--|---|----------------|------------------------------------|-------------------|-----------------------------|----------------|-----------------|
|  |  |   |                |                                    |                   | BC                          |                |                 |
|  |  |   |                |                                    |                   | AH7810                      | AH7815         | AH7820          |
| <b>P</b>                                       | Acier non allié  | C ≤ 0,25 % recuit                               | 125            | 428                                | P1                | -                           | -              | -               |
|  |  | C >= 0,25 ... >= 0,55 % recuit                  | 190            | 639                                | P2                | -                           | -              | -               |
|  |  | C >= 0,25 ... >= 0,55 % traité                  | 210            | 708                                | P3                | -                           | -              | -               |
|  |  | C ≤ 0,55 % recuit                               | 190            | 639                                | P4                | -                           | -              | -               |
|  |  | C ≤ 0,55 % traité                               | 300            | 1013                               | P5                | -                           | -              | -               |
|  |  | Aciers de décolletage (à copeaux courts) recuit | 220            | 745                                | P6                | -                           | -              | -               |
|  | Acier faiblement allié   | recuit  | 175            | 591                                | P7                | -                           | -              | -               |
|  |  | traité  | 300            | 1013                               | P8                | -                           | -              | -               |
|  |  | traité  | 380            | 1282                               | P9                | -                           | -              | -               |
|  |  | traité  | 430            | 1477                               | P10               | -                           | -              | -               |
|  | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | -                           | -              | -               |
|  |  | trempe et revenu                                | 300            | 1013                               | P12               | -                           | -              | -               |
|  |  | trempe et revenu                                | 400            | 1361                               | P13               | -                           | -              | -               |
|  | Acier inox   | ferritique, martensitique, recuit               | 200            | 675                                | P14               | -                           | -              | -               |
|  |  | martensitique, traité                           | 330            | 1114                               | P15               | -                           | -              | -               |
| austénitique                                   |  | 200   | 675            | M1                                 | -                 | -                           | -              |                 |
| <b>M</b>                                       | Acier inox   | austénitique                                    | 300            | 1013                               | M2                | -                           | -              | -               |
|  |  | austénitique-ferritique, Duplex                 | 230            | 778                                | M3                | -                           | -              | -               |
|  |  | ferritique                                      | 200            | 675                                | K1                | -                           | -              | -               |
| <b>K</b>                                       | Fonte malléable  | perlitique                                      | 260            | 867                                | K2                | -                           | -              | -               |
|  |  | faible résistance                               | 180            | 602                                | K3                | -                           | -              | -               |
|  | Fonte grise  | haute résistance / austénitique                 | 245            | 825                                | K4                | -                           | -              | -               |
|  |  | ferritique                                      | 155            | 518                                | K5                | -                           | -              | -               |
|  | Fonte à Graphite sphéroïdale                                   | perlitique                                      | 265            | 885                                | K6                | -                           | -              | -               |
| GGV (CGI)                                      |  | 200   | 675            | K7                                 | -                 | -                           | -              |                 |
| <b>N</b>                                       | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30             | -                                  | N1                | -                           | -              | -               |
|  |  | pouvant subir un durcissement, durci            | 100            | 343                                | N2                | -                           | -              | -               |
|  | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75             | 260                                | N3                | -                           | -              | -               |
|  |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90             | 314                                | N4                | -                           | -              | -               |
|  |  | > 12 % Si, ne pouvant pas subir de durcissement | 130            | 447                                | N5                | -                           | -              | -               |
|  | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70             | 250                                | N6                | -                           | -              | -               |
|  |  | non allié, cuivre électrolytique                | 100            | 343                                | N7                | -                           | -              | -               |
|  | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                     | 90             | 314                                | N8                | -                           | -              | -               |
|  |  | Alliage de cuivre à copeaux courts              | 110            | 382                                | N9                | -                           | -              | -               |
|  |  | forte résistance, Ampco                         | 300            | 1013                               | N10               | -                           | -              | -               |
| Thermoplaste (sans agents de charge abrasives) |  | -   | -              | N11                                | -                 | -                           | -              |                 |
| Matériaux non métalliques                      | Duroplaste (sans agents de charge abrasives)                   | -   | -              | N12                                | -                 | -                           | -              |                 |
|  | Matière plastique renforcée de fibres de verre GFRP            | -   | -              | N13                                | -                 | -                           | -              |                 |
|  | Matière plastique renforcé composite CFRP                      | -   | -              | N14                                | -                 | -                           | -              |                 |
|  | Plastique renforcé fibre aramide AFRP                          | -   | -              | N15                                | -                 | -                           | -              |                 |
|  | Graphite   | 80 Shore  | -              | N16                                | -                 | -                           | -              |                 |
| <b>S</b>                                       | Alliages réfractaires  | à base de Fe recuit                             | 200            | 675                                | S1                | -                           | -              | -               |
|  |  | à base de Fe durci                              | 280            | 943                                | S2                | -                           | -              | -               |
|  |  | à base Ni ou Co recuit                          | 250            | 839                                | S3                | -                           | -              | -               |
|  |  | à base Ni ou Co durci                           | 350            | 1177                               | S4                | -                           | -              | -               |
|  |  | à base Ni ou Co jeté                            | 320            | 1076                               | S5                | -                           | -              | -               |
|  | Alliage de titane  | Titane pur                                      | 200            | 675                                | S6                | -                           | -              | -               |
|  |  | Alliages Alpha + Beta, trempé                   | 375            | 1262                               | S7                | -                           | -              | -               |
|  |  | Alliages Beta                                   | 410            | 1396                               | S8                | -                           | -              | -               |
|  | Alliage de tungstène   |   | 300            | 1013                               | S9                | -                           | -              | -               |
|  | Alliage de molybdène   |   | 300            | 1013                               | S10               | -                           | -              | -               |
| <b>H</b>                                       | Acier trempé   | trempe et revenu                                | 50 HRC         | -                                  | H1                | 90 - 180 - 270              | 40 - 120 - 200 | 100 - 145 - 190 |
|  |  | trempe et revenu                                | 55 HRC         | -                                  | H2                | 90 - 180 - 270              | 40 - 120 - 200 | 100 - 145 - 190 |
|  |  | trempe et revenu                                | 60 HRC         | -                                  | H3                | 90 - 180 - 270              | 40 - 120 - 200 | 100 - 145 - 190 |
|  | Fonte durci  | trempe et revenu                                | 55 HRC         | -                                  | H4                | 90 - 180 - 270              | 40 - 120 - 200 | 100 - 145 - 190 |

Les données affichées dans le tableau sont des valeurs approximatives.  
 Il peut être nécessaire de les adapter à des applications d'usinage individuelles.  
 DU = Matériaux de coupe ultra-durs PCD sans revêtement  
 BC = Matériaux de coupe ultra-durs CBN avec revêtement  
 BU = matériaux de coupe ultra-durs CBN sans revêtement



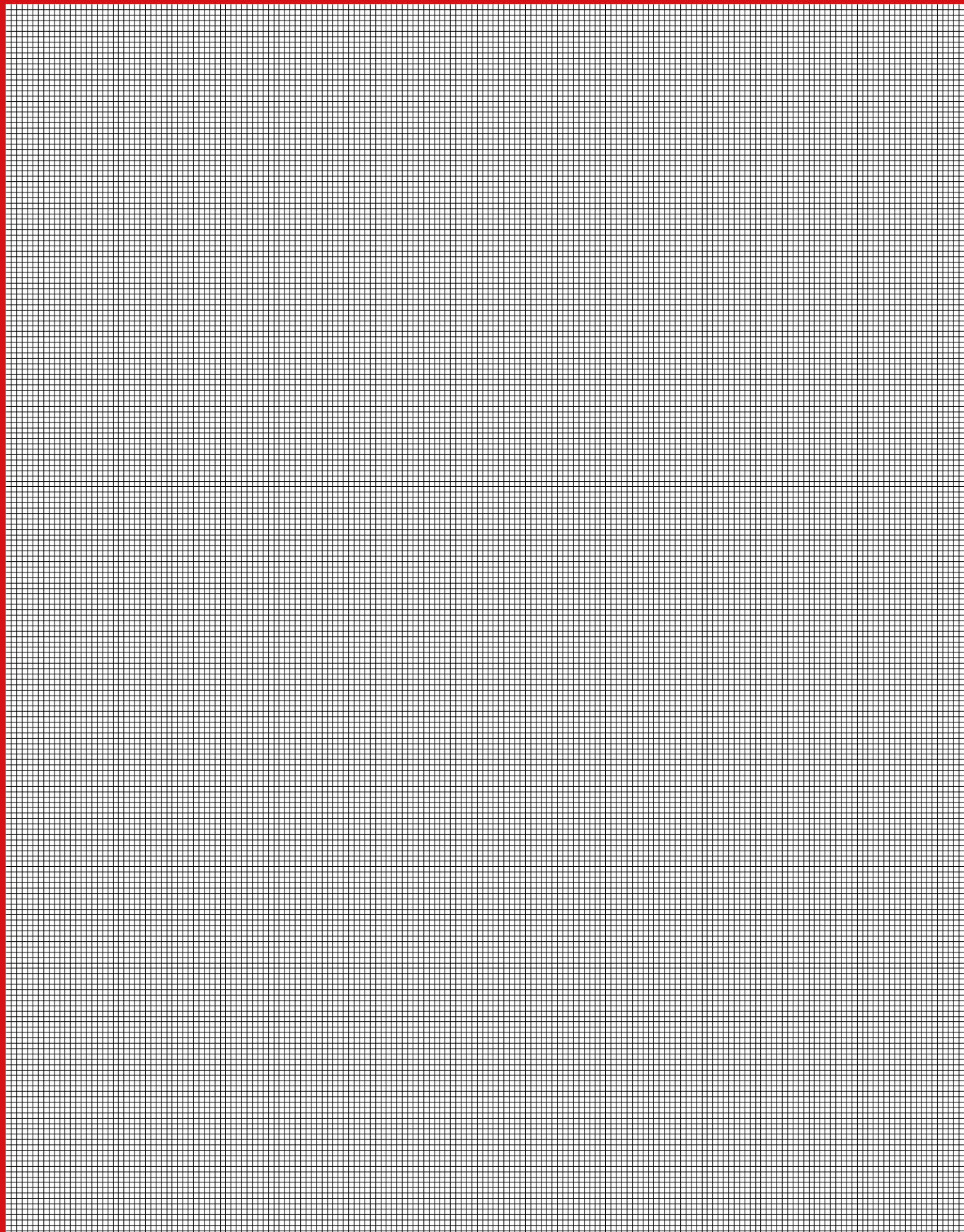
**For more information see**

*Per maggiori informazioni visita il sito*

Vous trouverez de plus amples informations sur



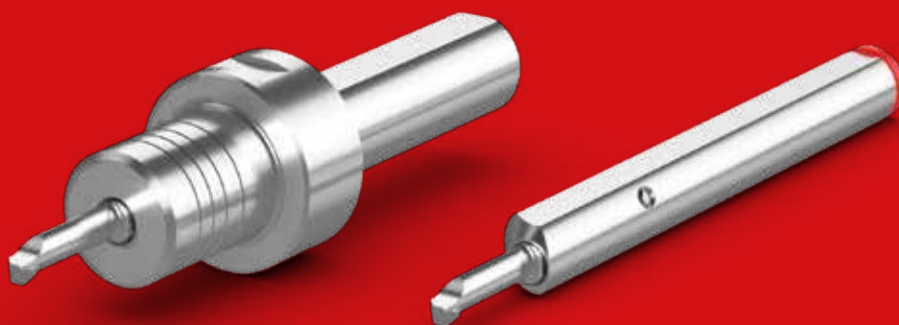
[www.arno.de](http://www.arno.de)



## AMS – ARNO Mini-System

### Internal machining system *Sistema di lavorazione interna* *Système d'usinage intérieur*

|                            |                                     |                           |           |
|----------------------------|-------------------------------------|---------------------------|-----------|
| • System presentation      | • <i>Presentazione del sistema</i>  | • Présentation du système | 476 – 481 |
| • Tool holders             | • <i>Utensili</i>                   | • Support de serrage      |           |
| – Tool selection           | – <i>Scelta di utensili</i>         | – Choix d'outils          | 482 – 486 |
| – Nomenclature system      | – <i>Sistema di identificazione</i> | – Système de désignation  | 487       |
| – Tool holders             | – <i>Adattatore</i>                 | – Support de serrage      | 488 – 501 |
| • Inserts                  | • <i>Inserti</i>                    | • Inserts de coupe        |           |
| – Description of grades    | – <i>Descrizione varietà</i>        | – Description des nuances | 502 – 504 |
| – Inserts                  | – <i>Inserti</i>                    | – Inserts de coupe        | 505 – 538 |
| – Recommended cutting data | – <i>Sistema di identificazione</i> | – Système de désignation  | 542 – 547 |
| • Application notes        | • <i>Suggerimenti tecnici</i>       | • Consignes d'utilisation | 548 – 550 |





# CENTRING MADE EASY.

**Modular and precise: the AMS – ARNO Mini-System for internal machining starts at a diameter of 0.7 mm and reaches depths of up to 50 mm.**

Rigid centring, guaranteed tip height and absolute dimensional accuracy – it's so easy with AMS for flexible operations in holes with small diameters.

This is how it works: The insert is clamped rigidly in central position by a ground chamfer on the shank and a tapered pin. A fixed stop guarantees repeatable positioning at tip height. Besides tool holders, there are also inserts with inner cooling to achieve optimised wear protection and precise coolant supply.

This results in reliable processes, maximum precision even at tight tolerances and an increase of one to four times in tool life.



## **Tool holders**

Every application is covered by 10 tool holders: standard or offset, hydraulic or polygon shank, for multi spindle or Swiss type machines. Available with coolant supply for longer tool life.



## **NEW: AMS boring bars with indexable inserts**

All the benefits of the AMS system with even greater efficiency: with AMS boring bars and the right indexable inserts.



# POSIZIONAMENTO E CENTRAGGIO SEMPLICE.

**Modulare e preciso: ARNO Mini-System AMS per lavorazioni interne a partire da diametri di 0,7 mm e fino a profondità di foratura di 50 mm.**

Allineamento centrale sicuro, altezza del tagliente garantita, elevatissima finitura superficiale e assoluta precisione dimensionale – tutto ciò è molto facile con AMS per la lavorazione flessibile di fori di piccolo diametro.

Funziona così: grazie all'inclinazione del codolo al grano di bloccaggio conico, l'inserto viene bloccato saldamente nella posizione centrale, mentre la spina di arresto garantisce la precisione dell'altezza delle punte. Per garantire un'ottimale resistenza dall'usura con un'alimentazione precisa del refrigerante, oltre agli adattatori sono disponibili anche inserti con refrigerante interno. Si ottengono così processi sicuri, massima precisione anche con tolleranze ridotte e una durata quadruplicata.



## **Adattatori**

Grazie a 10 adattatori ogni settore è coperto: nelle versioni standard o a gradini, idraulici oppure con gambo poligonale, per torni, plurimandrini o per torni a fantina mobile. Disponibili anche con raffreddamento interno per una durata prolungata.



## **NOVITÀ: Barenì AMS con inserti**

Tutti i vantaggi del sistema AMS adesso sono disponibili anche in versione più economica: con barenì AMS e con inserti adatti.



# LA MODULARITÉ EN TOUTE FACILITÉ.

**Processus : le mini système AMS d'ARNO pour l'usinage intérieur à partir de 0,7 mm de diamètre et jusqu'à 50 mm de profondeur de perçage.**

Une couche intermédiaire stable, une hauteur de pointe garantie, une qualité de finition extrême et un respect absolu des cotes : un jeu d'enfant avec AMS, le système conçu pour l'alésage flexible des petits diamètres.

Mode d'emploi : Avec un chanfrein sur l'arbre et une vis sans tête de forme conique, l'insert de coupe est solidement fixé sur le corps d'outil, un goujon de butée garantit la précision de répétition pour la hauteur de pointe. Pour une protection optimale contre l'usure avec un guidage précis du liquide de refroidissement, il existe non seulement des outils de serrage, mais aussi des inserts de coupe avec refroidissement interne. Il en résulte des processus sûrs, une précision maximale, même avec des tolérances serrées et une durée de vie multipliée par quatre.



### Porte-outils

Grâce aux 10 porte-outils, chaque domaine est couvert : Standard ou en décalé, tournage hydraulique ou avec tige polygonale, pour multibroches ou tours à chariotage.

Disponible avec refroidissement interne pour une durée de vie prolongée.

### NOUVEAU : Barre d'alésage AMS avec plaquettes de coupe amovibles

Tous les avantages du système AMS sont encore plus rentables : avec des barres d'alésage AMS et des plaquettes de coupe amovibles adaptées.





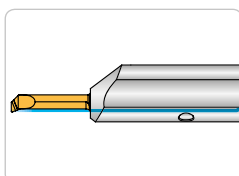
# OVERVIEW OF TOOL HOLDERS

## PANORAMICA PORTAINSERTI

## APERÇU DES SUPPORTS DE SERRAGE

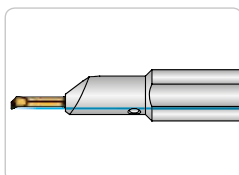
### Tool holders

*Portainseriti*  
Porte-outils



**Holder - Standard**  
*Stelo - Standard*  
Porte-outils – standard

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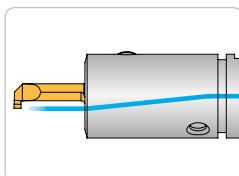


**Holder - Offset**  
*Stelo - Scaricato*  
Porte-outils - décalé

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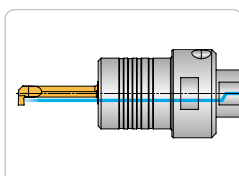
### Tool holders Special design

*Portainseriti esecuzione speciale*  
Porte-outils – modèles spéciaux



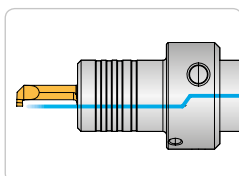
**Holder for Index/Traub - Holders for lathes**  
*Adattatore per Index/Traub - Adattatori per torni*  
Porte-outils pour tours Index/Traub

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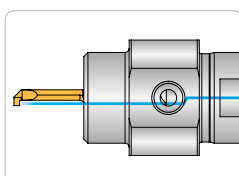
**Hydraulic Holder**  
*Adattatore idraulico*  
Porte-outils hydraulique

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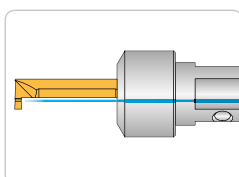
**Hydraulic Holder for Index/Traub - Holders for lathes**  
*Adattatore idraulici per Index/Traub - Adattatori per torni*  
Porte-outils hydrauliques pour tours Index/Traub

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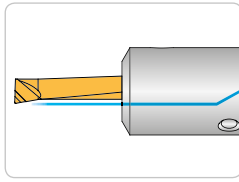
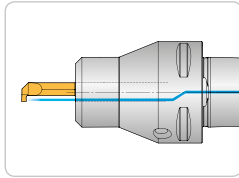
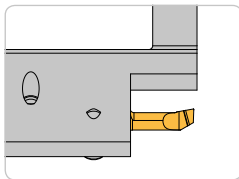
**Holder for STAR-lathes**  
*Adattatore per torni STAR*  
Porte-outils pour tours STAR

Page / Pagina / Page **493 – 494**

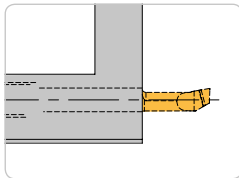


**Holders for lathes**  
*Adattatori per torni*  
Porte-outils pour tours

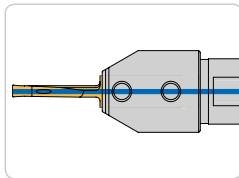
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**Tool holders Special design***Portainseriti esecuzione speciale*  
Porte-outils – modèles spéciaux**Holders for finishing***Adattatori corti per contromandrino*  
Porte-outils à aléserPage / Pagina / Page **497****Holders with Polygon-Shank***Adattatori con attacco poligonale*  
Porte-outils à queue polygonalePage / Pagina / Page **498****Holders for sliding head lathes and multi spindle machines***Adattatori per torni a fantina mobile e plurimandrino*

Porte-outils pour tours à poupée mobile et machines multibroches

Page / Pagina / Page **499****Holder for sliding head lathes on counter spindle***Adattatori per torni a fantina mobile su contromandrino*

Porte-outils pour tours à poupée mobile sur contre-broche

Page / Pagina / Page **500****SAV holder - axial grooving***Stelo SAV – Scanalatura assiale*  
Porte-outils SAV – Gorge axialePage / Pagina / Page **501**



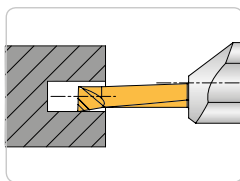
# OVERVIEW OF INSERTS

## PANORAMICA INSERTI

## APERÇU DES INSERTS DE COUPE

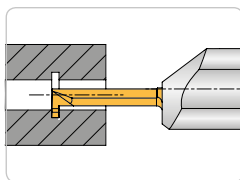
**Inserts**

Inserti  
Inserts de coupe



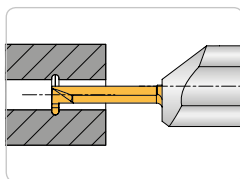
**Turning**  
*Tornitura*  
Tournage

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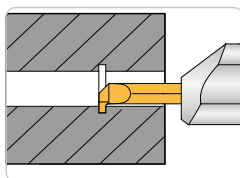
**Grooving**  
*Scanalatura*  
Usinage de gorges

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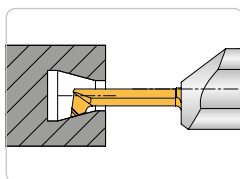
**Full radius grooving**  
*Profilo a raggio pieno*  
Gorges rayonnées

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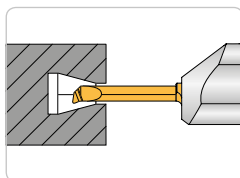
**Circlip grooving DIN 471/472**  
*Sedi Seeger DIN 471/472*  
Gorges de circlips DIN 471/472

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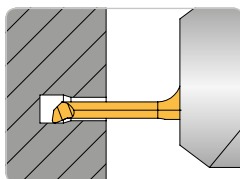
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*Copiatura*  
Copiage

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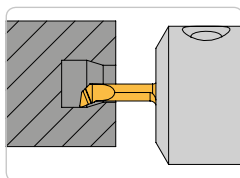
**Copying – reinforced execution**  
*Copiatura – versione rinforzata*  
Copiage – modèle renforcé

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**Copying – offset and reinforced design**  
*Copiatura – versione disassata e rinforzata*  
Copiage – modèle décalé ou renforcé

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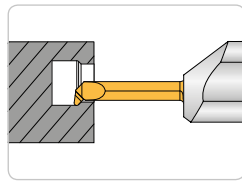
**Copying – for tool holders STAR Swiss type machines (HAMS-US...)** / *Copiatura – Per portainseriti per macchine STAR (HAMS-US...)* / Copiage – pour supports de serrage pour tours STAR (HAMS-US...)

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**Inserts**

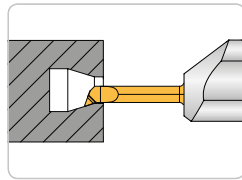
Inserti

Inserts de coupe



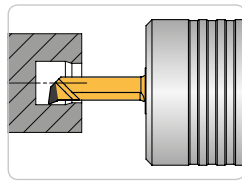
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Copiage 45°

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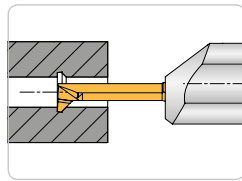
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Copiage 20/20°

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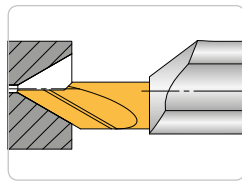
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*Copiatura - riporto CBN*  
Copiage – Insert CBN

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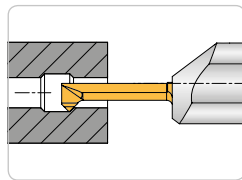
**Pre-grooving and chamfering**  
*Pre-scanalatura e smusso*  
Ébauche et chanfreinage

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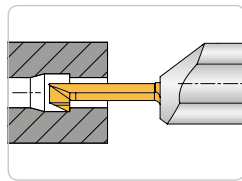
**Centre Chamfering 45°/60°**  
*Smussatura centrale 45°/60°*  
Chanfreinage centre 45°/60°

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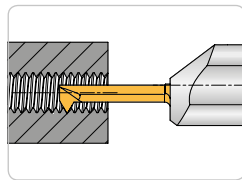
**Chamfering 45**  
*Smusso 45°*  
Chanfreinage 45°

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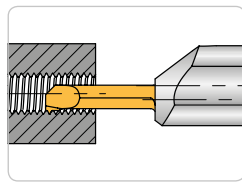
**Back turning**  
*Lavorazione in tirata*  
Tournage en tirant

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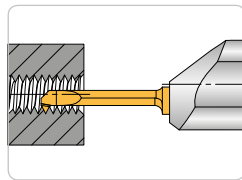
**Threading 60° – Metric-partial profile**  
*Filettatura 60° – Metrica profilo parziale*  
Filetage 60° – Profil partiel métrique

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**Threading 60° – Metric-full profile**  
*Filettatura 60° – Metrica profilo completo*  
Filetage 60° – Profil complet métrique

Page / Pagina / Page **523**

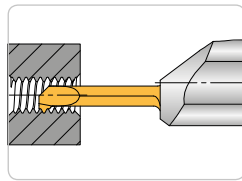


**Whitworth thread 55° – Partial profile**  
*Filettatura Whitworth 55° – Profilo parziale*  
Filetage Whitworth 55° – Profil partiel

Page / Pagina / Page **524**

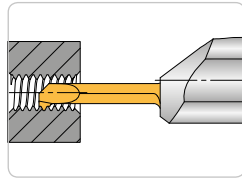
**Inserts**

Inserti  
Inserts de coupe



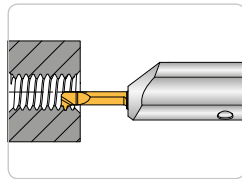
**Whitworth thread 55° – DIN ISO 228 - full profile**  
*Filettatura Whithworth 55° – DIN ISO 228 - profilo completo*  
Filetage 55° Whitworth – DIN ISO 228 - profil complet

Page / Pagina / Page **525**



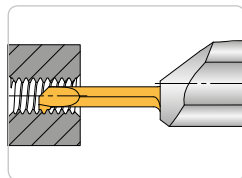
**Whitworth pipe thread 55° BSW – full profile**  
*Filettatura Whithworth 55° BSW – profilo completo*  
Filetage tubulaire Whitworth 55° BSW – profil complet

Page / Pagina / Page **526**



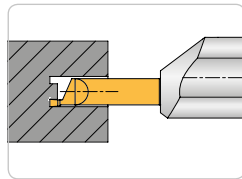
**Trapezoidal thread 30° – DIN ISO 103 - partial profile**  
*Filettatura trapezoidale 30° – DIN ISO 103 - profilo parziale*  
Filetage trapézoïdal 30° – DIN ISO 103 - profil partiel

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**American thread 60° - UN – full profile**  
*Filettatura norme americane 60° - UN – profilo completo*  
Filetage ISO en pouce américain 60° - UN – profil complet

Page / Pagina / Page **528**

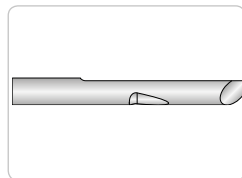


**Axial grooving**  
*Scanalatura assiale*  
Gorge axiale

Page / Pagina / Page **529**

**Special inserts**

Inserti speciali  
Inserts spéciaux

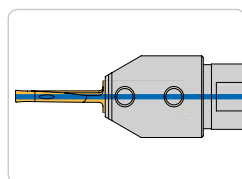


**Blanks fo special profiles**  
*Semilavorato per la realizzazione di speciali*  
Produits semi-finis pour profilage

Page / Pagina / Page **530**

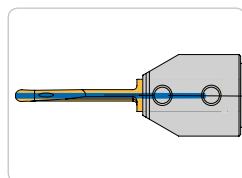
**SAV**

SAV  
SAV



**SAV - axial grooving**  
*SAV – Scanalatura assiale*  
SAV – Gorge axiale

Page / Pagina / Page **537**



**Axial grooving – full radius design**  
*Scanalatura assiale – Esecuzione a raggio completo*  
Gorge axiale – version à rayon complet

Page / Pagina / Page **538**



Request for special tools page **539**

Richiesta utensili speciali pagina **540**

Demande outils spéciaux page **541**

## Tool holders

Portainseriti

Support de serrage



| HAMS                         | 16                                | 06                                     | R/L                   |
|------------------------------|-----------------------------------|--|-----------------------|
| <b>H = Holder</b>            | <b>Shank diameter 16 mm</b>       | <b>Insert diameter 6 mm</b>            | <b>Design</b>         |
| <b>A = ARNO®</b>             | <i>Diametro dello stelo 16 mm</i> | <i>Diametro dell'inserto 6 mm</i>      | <b>R = right-hand</b> |
| <b>M = Mini</b>              | <b>Diamètre de tige 16 mm</b>     | <b>Diamètre d'insert de coupe 6 mm</b> | <b>L = left-hand</b>  |
| <b>S = Grooving</b>          |                                   |  | <i>Esecuzione</i>     |
| <i>H = Supporto</i>          |                                   |  | <i>D = destra</i>     |
| <i>A = ARNO®</i>             |                                   |  | <i>S = sinistra</i>   |
| <i>M = Mini</i>              |                                   |  | <b>Modèle</b>         |
| <i>S = Troncatura</i>        |                                   |  | <b>R = droite</b>     |
| <b>H = support</b>           |                                   |  | <b>L = gauche</b>     |
| <b>A = ARNO®</b>             |                                   |  |                       |
| <b>M = mini</b>              |                                   |  |                       |
| <b>S = usinage de gorges</b> |                                   |  |                       |

## Inserts

Inserti

Inserts de coupe

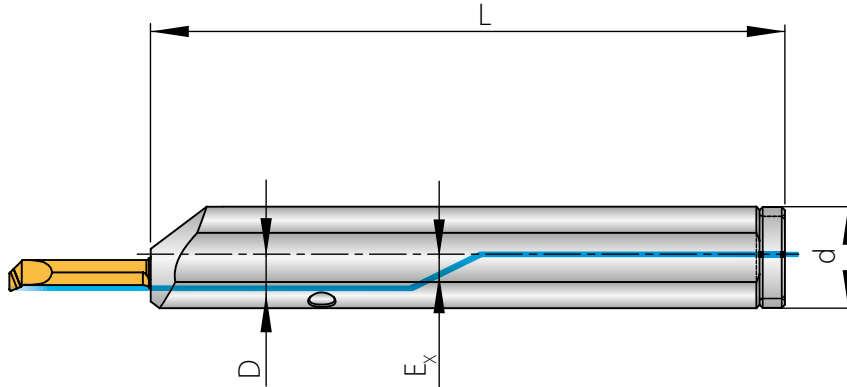


| AMS                          | D                    | 25                              | 04                                    | 01                                       | 01                       | 100   | 40R                              |
|------------------------------|----------------------|---------------------------------|---------------------------------------|--|--------------------------|---|----------------------------------|
| <b>A = ARNO®</b>             | <b>D = Turning</b>   | <b>D<sub>min</sub> = 2.5 mm</b> | <b>Groove width EB = 0.4 mm</b>       | <b>Cutting depth ET = 0.1 mm</b>         | <b>Radius R = 0.1 mm</b> | <b>Overhang length AKL = 10 mm</b>                    | <b>Shank diameter 4 mm</b>       |
| <b>M = Mini</b>              | <i>D = Tornitura</i> | <i>D<sub>min</sub> = 2,5 mm</i> | <i>Larghezza gola EB = 0,4 mm</i>     | <i>Profondità di taglio ET = 0,1 mm</i>  | <i>Raggio R = 0,1 mm</i> | <i>Lunghezza AKL = 10 mm</i>                          | <b>Design</b>                    |
| <b>S = Grooving</b>          | <b>D = tournage</b>  | <b>D<sub>min</sub> = 2,5 mm</b> | <b>Largeur de rainure EB = 0,4 mm</b> | <b>Profondeur de rainure ET = 0,1 mm</b> | <b>Rayon R = 0,1 mm</b>  | <b>Longueur de dépassement de l'outil AKL = 10 mm</b> | <b>R = right-hand</b>            |
| <i>A = ARNO®</i>             |                      |                                 |                                       |  |                          |   | <b>L = left-hand</b>             |
| <i>M = Mini</i>              |                      |                                 |                                       |  |                          |   | <i>Diametro dello stelo 4 mm</i> |
| <i>S = Troncatura</i>        |                      |                                 |                                       |  |                          |   | <i>Esecuzione</i>                |
| <b>A = ARNO®</b>             |                      |                                 |                                       |  |                          |   | <i>D = destra</i>                |
| <b>M = mini</b>              |                      |                                 |                                       |  |                          |   | <i>S = sinistra</i>              |
| <b>S = usinage de gorges</b> |                      |                                 |                                       |  |                          |   | <b>Diamètre de tige 4 mm</b>     |
|                              |                      |                                 |                                       |  |                          |   | <b>Modèle</b>                    |
|                              |                      |                                 |                                       |  |                          |   | <b>R = droite</b>                |
|                              |                      |                                 |                                       |  |                          |   | <b>L = gauche</b>                |

## Holder - Standard / Stelo - Standard / Support de serrage - standard



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D  | d  | L   | E <sub>x</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|----|----|-----|----------------|------------------------------|
| HAMS 1204L/R                       | 4  | 12 | 100 | 2,35           | AMS...40L/R                  |
| HAMS 1206L/R                       | 6  | 12 | 100 | 2,35           | AMS...60L/R                  |
| HAMS 1606L/R                       | 6  | 16 | 120 | 2,80           | AMS...60L/R                  |
| HAMS 1608L/R                       | 8  | 16 | 120 | 2,80           | AMS...80L/R                  |
| HAMS 2010R                         | 10 | 20 | 120 | 2,80           | AMS...100R                   |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

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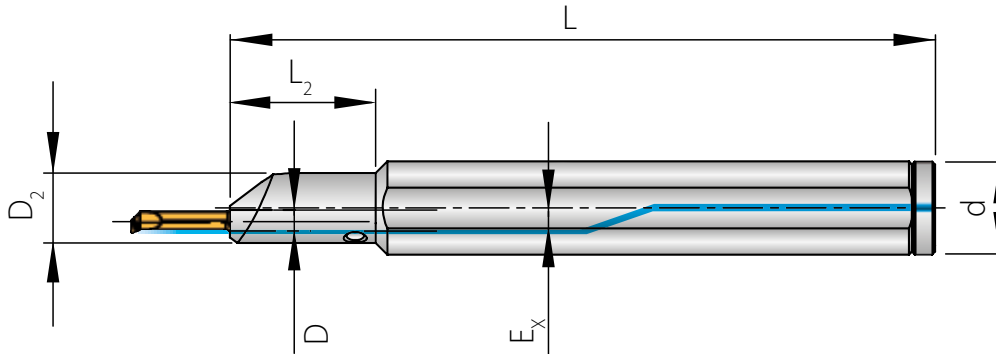
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Coolant seal ring<br>Anello tenuta refrigerante<br>Joint d'étanchéité de liquide de refroidissement |
|--------------------------------------|----------------------|----------------------|---|
| HAMS 1204 ..-HAMS 1206 ..            | AS 0043              | KP 3111              | KVR 12  |
| HAMS 1606 ..-HAMS 1608 ..            | AS 0044              | KP 1111              | KVR 16  |
| HAMS 2010 ..                         | AS 0044              | KP 1111              | KVR 20  |

Holder - Offset / Stelo - Scaricato / Porte-outils - décalé



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | d  | L   | L <sub>2</sub> | E <sub>x</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|---|----------------|----|-----|----------------|----------------|----------------------------|
| HAMS 1604L/R                       | 4 | 12             | 16 | 120 | 25             | 2,35           | AMS...40L/R                |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

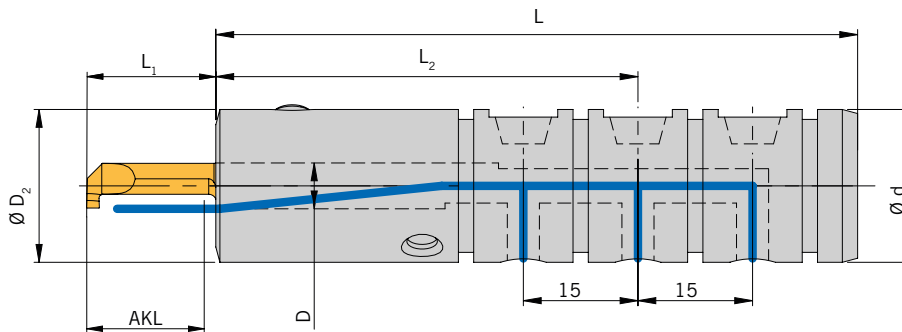
*Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!*

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Coolant seal ring<br>Anello tenuta refrigerante<br>Joint d'étanchéité de liquide de refroidissement |
|--------------------------------------|----------------------|----------------------|---|
| HAMS 1604 ..                         | AS 0043              | KP 3111              | KVR 16  |

## Holder for Index/Traub - Holders for lathes / Adattatore per Index/Traub - Adattatori per torni / Supports de serrage pour tours Index/Traub



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | d  | L  | L <sub>2</sub> |
|------------------------------------|---|----------------|----|----|----------------|
| HAMS 2004-TNL-TR                   | 4 | 20             | 20 | 84 | 55.3           |
| HAMS 2006-TNL-TR                   | 6 | 20             | 20 | 84 | 55.3           |
| HAMS 2008-TNL-TR                   | 8 | 20             | 20 | 84 | 55.3           |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS...-TNL-TR                       | AS 0044              | KP 1111              |

### Overhang / Dimensioni / Dimensions

| D | AKL  | L <sub>1</sub> |
|---|------|----------------|
| 4 | 2,0  | 4,0            |
| 4 | 5,0  | 6,5            |
| 4 | 6,0  | 8,0            |
| 4 | 7,5  | 10,0           |
| 4 | 10,0 | 12,0           |
| 4 | 15,0 | 17,0           |
| 4 | 20,0 | 22,0           |
| 6 | 10,0 | 12,0           |
| 6 | 18,0 | 20,0           |
| 6 | 20,0 | 22,0           |
| 6 | 30,0 | 32,0           |
| 6 | 40,0 | 42,0           |
| 6 | 50,0 | 52,0           |
| 8 | 10,0 | 12,0           |
| 8 | 25,0 | 17,0           |
| 8 | 30,0 | 32,0           |
| 8 | 42,0 | 44,0           |
| 8 | 45,0 | 47,0           |
| 8 | 50,0 | 52,0           |

#### Assembly options, example

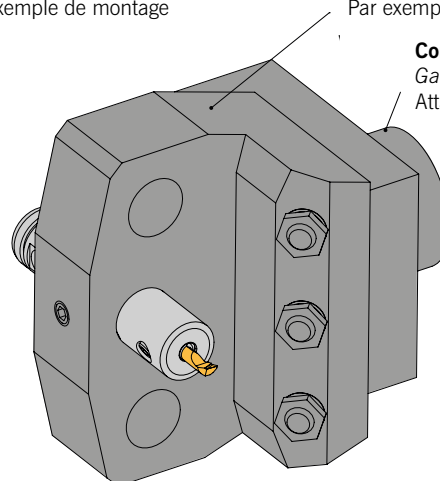
Montaggio, esempio  
Exemple de montage

#### Example basic holder W7040111

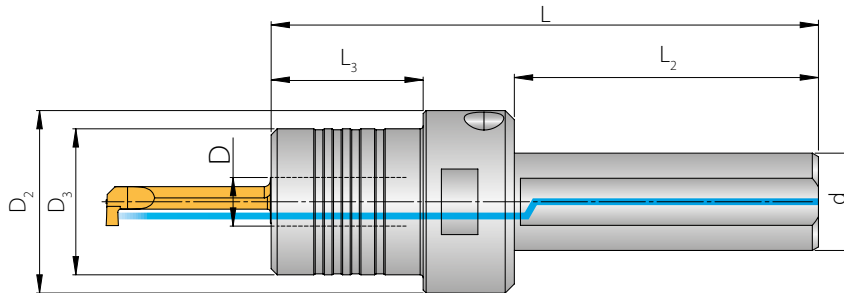
Esempio W7040111  
Par exemple version W7040111

#### Compact shank 45

Gambo compatto 45  
Attachement compact 45



## Hydraulic Holder / Adattatore idraulico / Porte-outils hydraulique



### HOLDERS / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | D <sub>3</sub> | d  | L    | L <sub>2</sub> | L <sub>3</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|----------------|----|------|----------------|----------------|-----------------------------|
| <b>HAMS 1604R-HYD.</b>             | 4 | 30             | 18             | 16 | 82,5 | 50             | 18             | AMS...40R                   |
| <b>HAMS 1606R-HYD.</b>             | 6 | 30             | 20             | 16 | 90,0 | 50             | 25             | AMS...60R                   |
| <b>HAMS 1608R-HYD.</b>             | 8 | 30             | 24             | 16 | 90,0 | 50             | 25             | AMS...80R                   |



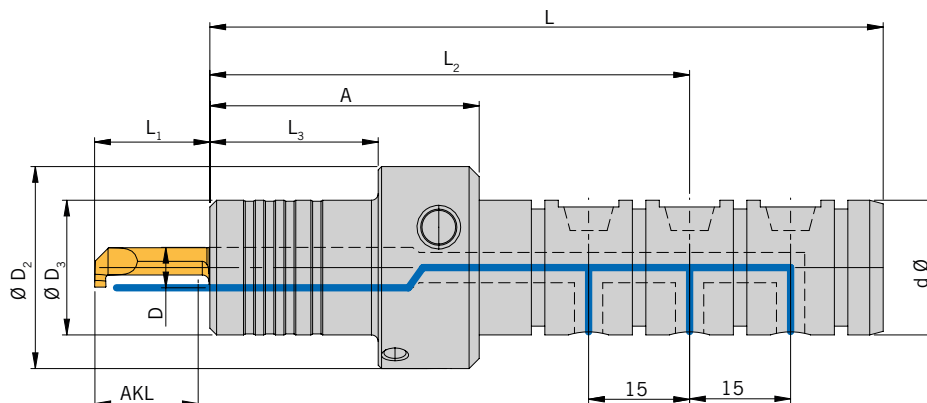
The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

*Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!*

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !



## Hydraulic Holder for Index/Traub - Holders for lathes / Adattatore idraulico per Index/Traub - Adattatori per torni / Supports de serrage hydrauliques pour tours Index/Traub



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | D <sub>3</sub> | d  | L     | L <sub>2</sub> | L <sub>3</sub> |
|------------------------------------|---|----------------|----------------|----|-------|----------------|----------------|
| HAMS 2004-HYD-TNL-TR               | 4 | 30             | 20             | 20 | 92,5  | 63.8           | 17.5           |
| HAMS 2006-HYD-TNL-TR               | 6 | 30             | 20             | 20 | 100,0 | 71.3           | 25             |
| HAMS 2008-HYD-TNL-TR               | 8 | 30             | 20             | 20 | 100,0 | 71.3           | 25             |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

6

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis      | O-ring<br>O-ring<br>Joint torique |
|--------------------------------------|---------------------------|-----------------------------------|
| HAMS ...HYD-TNL-TR                   | 1 x AS 0043 / 1 x AS 0074 | OR 17X1,5-NBR70                   |

### Overhang / Dimensioni / Dimensions

| D | AKL  | L <sub>1</sub> |
|---|------|----------------|
| 4 | 2,0  | 4,0            |
| 4 | 5,0  | 6,5            |
| 4 | 6,0  | 8,0            |
| 4 | 7,5  | 10,0           |
| 4 | 10,0 | 12,0           |
| 4 | 15,0 | 17,0           |
| 4 | 20,0 | 22,0           |
| 6 | 10,0 | 12,0           |
| 6 | 18,0 | 20,0           |
| 6 | 20,0 | 22,0           |
| 6 | 30,0 | 32,0           |
| 6 | 40,0 | 42,0           |
| 6 | 50,0 | 52,0           |
| 8 | 10,0 | 12,0           |
| 8 | 25,0 | 17,0           |
| 8 | 30,0 | 32,0           |
| 8 | 42,0 | 44,0           |
| 8 | 45,0 | 47,0           |
| 8 | 50,0 | 52,0           |

#### Assembly options, example

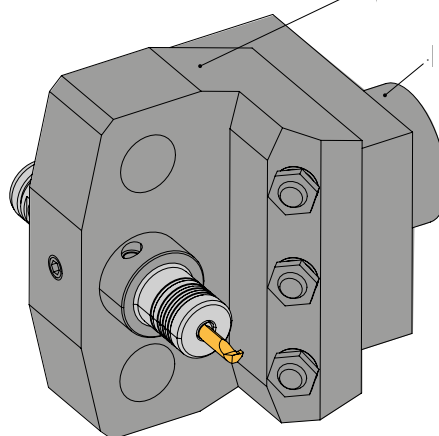
Montaggio, esempio  
Exemple de montage

#### Example basic holder W7040111

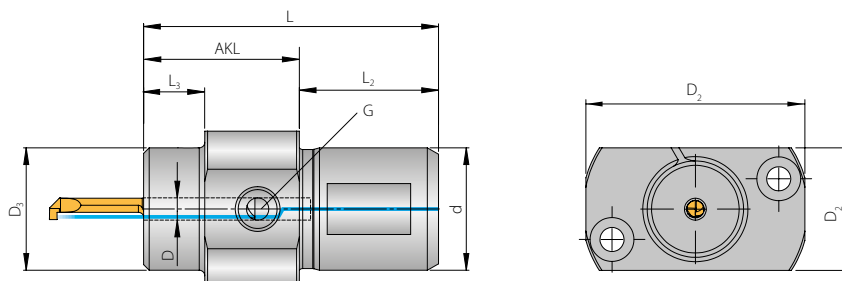
Esempio W7040111  
Par exemple version W7040111

#### Compact shank 45

Gambo compatto 45  
Attachement compact 45



## Holder for STAR-lathes / Adattatore per torni STAR / Porte-outils pour tours STAR



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | D <sub>3</sub> | d  | AKL | L  | L <sub>2</sub> | L <sub>3</sub> | G     | Insert<br>Insero<br>Insert |
|------------------------------------|---|----------------|----------------|----|-----|----|----------------|----------------|-------|----------------------------|
| HAMS 2204-A28-SR                   | 4 | 28 x 50        | 22             | 22 | 28  | 53 | 25             | 11             | M8x1  | AMS...40R                  |
| HAMS 2204-A50-S2-SR                | 4 | 28 x 50        | 22             | 22 | 50  | 75 | 25             | 33             | G 1/8 | AMS...40R                  |
| HAMS 2204-A50A-S2-SR               | 4 | 32,5 x 37,5    | 22             | 22 | 50  | 75 | 35             | 33             | G 1/8 | AMS...40R                  |
| HAMS 2206-A33-SR                   | 6 | 28 x 50        | 22             | 22 | 28  | 53 | 25             | 16             | M8x1  | AMS...60R                  |
| HAMS 2206-A50-S2-SR                | 6 | 28 x 50        | 22             | 22 | 50  | 75 | 25             | 33             | G 1/8 | AMS...60R                  |
| HAMS 2206-A50A-S2-SR               | 6 | 32,5 x 37,5    | 22             | 22 | 50  | 75 | 25             | 33             | G 1/8 | AMS...60R                  |
| HAMS 3004-A28-SR                   | 4 | 28 x 50        | 22             | 30 | 28  | 53 | 25             | 11             | M8x1  | AMS...40R                  |
| HAMS 3204-A28-SR                   | 4 | 28 x 50        | 22             | 32 | 28  | 53 | 25             | 11             | M8x1  | AMS...40R                  |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inseri per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

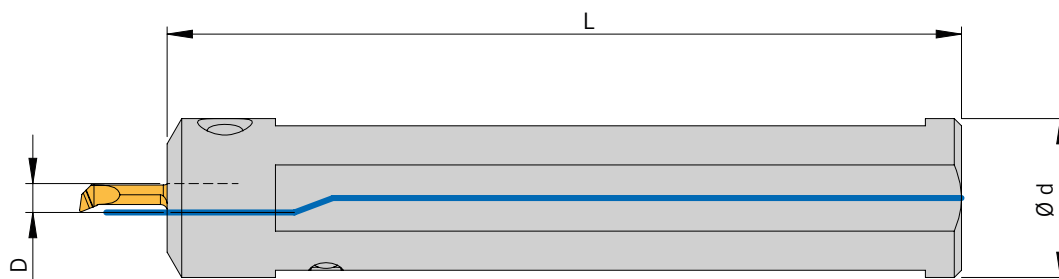
Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

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### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS ...SR                           | AS 0044              | KP 1111              |

## Holder for STAR-lathes / Adattatore per torni STAR / Porte-outils pour tours STAR



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | d  | L   | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----|-----|------------------------------|
| HAMS-US- 2204-SR                   | 4 | 22 | 110 | AMS-US-...40R                |

These holders can be used for X-axis and Y-axis feed.

Questi adattatori possono essere utilizzati per l'incremento sull'asse X e sull'asse Y.  
Ces supports peuvent être utilisés aussi bien en position d'axe X que d'axe Y.

**Note: The complete holder must be rotated 90° to use another infeed axis! In doing so, the clamping screw can always be accessed from below or from the side. If you use the holder upside down, access can be gained from above or from the side.**

Nota: l'adattatore completo deve essere ruotato di 90° per poter utilizzare un altro asse di incremento! La vite di bloccaggio è sempre accessibile dal basso o lateralmente. Se si utilizza l'inserito invertito dell'adattatore, si può accedere alla vite di bloccaggio dall'alto o lateralmente.

Remarque : le support entier doit être tourné de 90° afin de pouvoir utiliser un autre axe ! La vis de serrage reste toujours accessible par le dessous ou le côté. Si le support est utilisé retourné, l'accès à la vis de serrage se fait par le dessus ou le côté.

**The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!**

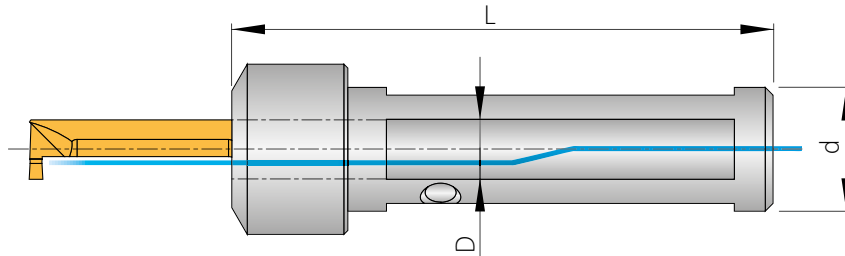
Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS-US-...                          | AS 0044              | KP 1111              |

## Holders for lathes / Adattatori per torni / Porte-outils pour tours



### Holders / Adattatore / Porte-outils

#### CITIZEN

| Designation<br>Articolo<br>Article | D | L   | Connection<br>Filetto<br>Filetage | Insert<br>Inserto<br>Insert |
|------------------------------------|---|-----|-----------------------------------|-----------------------------|
| HAMS 1"04-CR                       | 4 | 100 | G 1/4"                            | AMS...40R                   |
| HAMS 1"06-CR                       | 6 | 100 | G 1/4"                            | AMS...60R                   |
| HAMS 1"08-CR                       | 8 | 100 | G 1/4"                            | AMS...80R                   |
| HAMS 3/4"04-CR                     | 4 | 100 | G 1/8"                            | AMS...40R                   |
| HAMS 3/4"06-CR                     | 6 | 100 | G 1/8"                            | AMS...60R                   |
| HAMS 3/4"08-CR                     | 8 | 100 | G 1/8"                            | AMS...80R                   |

#### Holders with 2 flats = CITIZEN

Adattatore con 2 piani di bloccaggio = CITIZEN

Supports avec 2 plats de serrage = CITIZEN



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

### Holders / Adattatore / Porte-outils

#### STAR

| Designation<br>Articolo<br>Article | D | d  | L   | Connection<br>Filetto<br>Filetage | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----|-----|-----------------------------------|-----------------------------|
| HAMS 1604-SR                       | 4 | 16 | 70  | G 1/8"                            | AMS...40R                   |
| HAMS 1606-SR                       | 6 | 16 | 70  | G 1/8"                            | AMS...60R                   |
| HAMS 1608-SR                       | 8 | 16 | 70  | G 1/8"                            | AMS...80R                   |
| HAMS 2204-SR                       | 4 | 22 | 110 | G 1/8"                            | AMS...40R                   |
| HAMS 2204-SR G1/4"                 | 4 | 22 | 110 | G 1/4"                            | AMS...40R                   |
| HAMS 2206-SR                       | 6 | 22 | 110 | G 1/8"                            | AMS...60R                   |
| HAMS 2206-SR G1/4"                 | 6 | 22 | 110 | G 1/4"                            | AMS...60R                   |
| HAMS 2208-SR                       | 8 | 22 | 110 | G 1/8"                            | AMS...80R                   |

#### Holders with 4 flats = STAR

Adattatore con 4 piani di bloccaggio = STAR

Porte-outils avec 4 surfaces de serrage = STAR



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

## Holders / Adattatore / Porte-outils

## TORNOS, TSUGAMI, HANWHA

| Designation<br>Articolo<br>Article | D | d  | L   | Connection<br>Filetto<br>Filetage | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----|-----|-----------------------------------|------------------------------|
| HAMS 2004-TOR                      | 4 | 20 | 90  | G 1/8"                            | AMS...40R                    |
| HAMS 2006-TOR                      | 6 | 20 | 90  | G 1/8"                            | AMS...60R                    |
| HAMS 2008-TOR                      | 8 | 20 | 90  | G 1/8"                            | AMS...80R                    |
| HAMS 2504-170-TOR                  | 4 | 25 | 170 | G 1/8"                            | AMS...40R                    |
| HAMS 2504-TOR                      | 4 | 25 | 100 | G 1/8"                            | AMS...40R                    |
| HAMS 2506-170-TOR                  | 6 | 25 | 170 | G 1/8"                            | AMS...60R                    |
| HAMS 2506-TOR                      | 6 | 25 | 100 | G 1/8"                            | AMS...60R                    |
| HAMS 2508-TOR                      | 8 | 25 | 100 | G 1/8"                            | AMS...80R                    |

## Holders with 2 flats = TORNOS

Adattatore con 2 piani di bloccaggio = TORNOS

Porte-outils avec 2 surfaces de serrage = TORNOS

## Holders with 2 flats = TSUGAMI

Adattatore con 2 piani di bloccaggio = TSUGAMI

Porte-outils avec 2 surfaces de serrage = TSUGAMI

## Holders with 2 flats = HANWHA

Adattatore con 2 piani di bloccaggio = HANWHA

Porte-outils avec 2 surfaces de serrage = HANWHA



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

## Holders / Adattatore / Porte-outils

## TRAUB

| Designation<br>Articolo<br>Article | D | d  | L   | Connection<br>Filetto<br>Filetage | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----|-----|-----------------------------------|------------------------------|
| HAMS 2804-TR                       | 4 | 28 | 120 | G 1/4"                            | AMS...40R                    |
| HAMS 2806-TR                       | 6 | 28 | 120 | G 1/4"                            | AMS...60R                    |

## Holders with 2 flats = TRAUB

Adattatore con 2 piani di bloccaggio = TRAUB

Porte-outils avec 2 surfaces de serrage = TRAUB



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

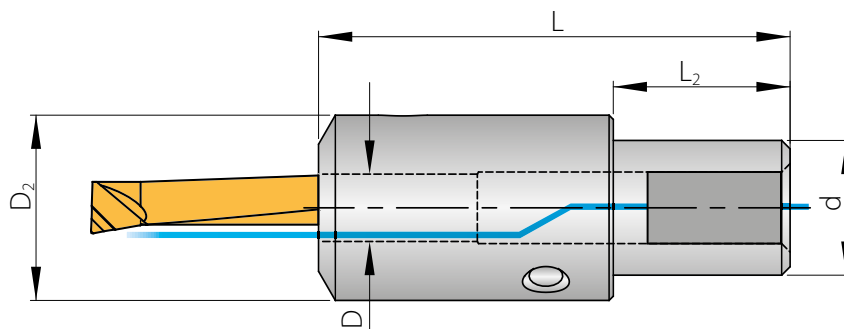
Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS ...CR                           | AS 0044              | KP 1111              |
| HAMS ...SR                           | AS 0044              | KP 1111              |
| HAMS ...TOR                          | AS 0044              | KP 1111              |
| HAMS ...TR                           | AS 0044              | KP 1111              |

## HOLDERS for finishing / Adattatori corti per contromandrino / Porte-outils à aléser



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>2</sub> | d  | L  | L <sub>2</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|---|----------------|----|----|----------------|------------------------------|
| HAMS 1604-AR                       | 4 | 22             | 16 | 56 | 21             | AMS...40R                    |
| HAMS 1606-AR                       | 6 | 22             | 16 | 56 | 21             | AMS...60R                    |
| HAMS 1608-AR                       | 8 | 22             | 16 | 56 | 21             | AMS...80R                    |



The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!

Inseriti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!

Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

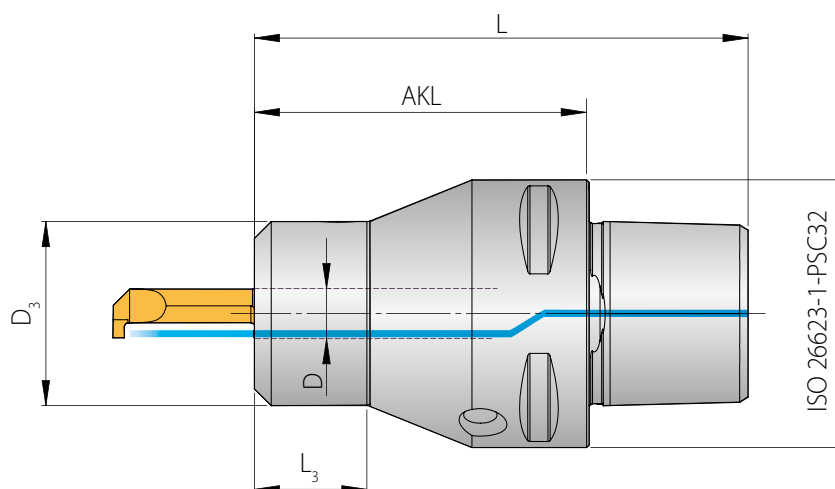
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS ..-AR                           | AS 0044              | KP 1111              |

## HOLDERS with Polygon-Shank / Adattatori con attacco poligonale / Porte-outils à queue polygonale



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | D <sub>3</sub> | AKL | L  | L <sub>3</sub> | Insert<br>Insero<br>Insert |
|------------------------------------|---|----------------|-----|----|----------------|----------------------------|
| HAMS PSC3206R                      | 6 | 22             | 40  | 59 | 13             | AMS...60R                  |

**6** The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!  
Inseri per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura „D“!  
Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

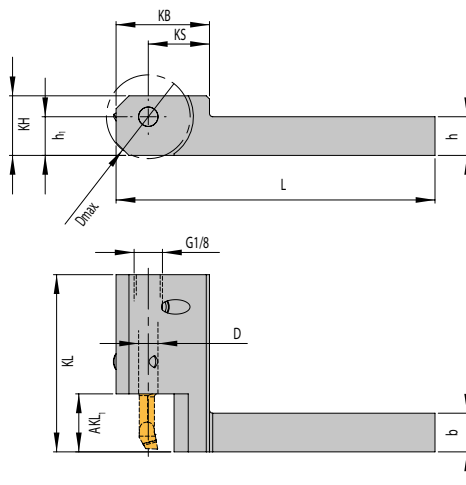
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| HAMS PSC..                           | AS 0044              | KP 1111              |

## Holders for sliding head lathes and multi spindle machines / Adattatori per torni a fantina mobile e plurimandrino / Porte-outils pour tours à poupée mobile et machines multibroches



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | h  | b  | L  | KB | KS | KL   | AKL <sub>1</sub> | KH   | h <sub>1</sub> | D <sub>max</sub> | Connection<br>Filetto<br>Filetage | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----|----|----|----|----|------|------------------|------|----------------|------------------|-----------------------------------|-----------------------------|
| <b>HAMS 121204-R</b>               | 4 | 12 | 12 | 98 | 28 | 19 | 52,5 | 18               | 18,5 | 12             | 26               | G 1/8"                            | AMS...40R                   |
| <b>HAMS 121206-R</b>               | 6 | 12 | 12 | 99 | 29 | 19 | 55,0 | 18               | 18,5 | 12             | 26               | G 1/8"                            | AMS...60R                   |

D<sub>max</sub> = Maximum diameter in solid  
D<sub>max</sub> = Diametro massimo lavorazione dal pieno  
D<sub>max</sub> = Diamètre maximum dans le plein

The inserts for these holders you will find on pages 505 to 536. Note measurement „D“!  
Inserti per questi adattatori a pagg. da 505 a 536. Fare attenzione alla misura "D"!  
Tous les inserts de coupe des pages 505 à 536 peuvent être montés sur ces supports. Respecter la dimension « D » !

### Spare Parts / Ricambi / Pièces de rechange

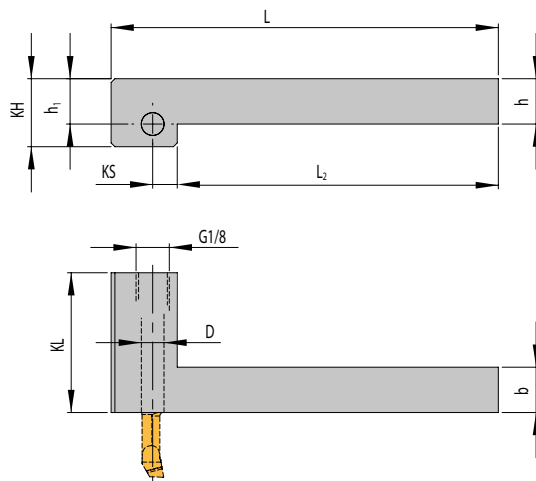
| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| <b>HAMS 12..04-R</b>                 | AS 0043              | KP 3111              |
| <b>HAMS 12..06-R</b>                 | AS 0044              | KP 1111              |



## Holder for sliding head lathes on counter spindle / Adattatori per torni a fantina mobile su contromandrino / Porte-outils pour tours à poupée mobile sur contre-broche



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D | h  | b  | L     | L <sub>2</sub> | KS  | KL | KH | h <sub>1</sub> | Connection<br>Filetto<br>Filetage | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----|----|-------|----------------|-----|----|----|----------------|-----------------------------------|-----------------------------|
| <b>HAMS 121206-R-GS</b>            | 6 | 12 | 12 | 102,5 | 85             | 6,5 | 37 | 18 | 12             | G 1/8"                            | AMS...60R                   |



Please use AMS-... .60R for these holders.

Utilizzare inserti AMS-... .60R con questi adattatori.

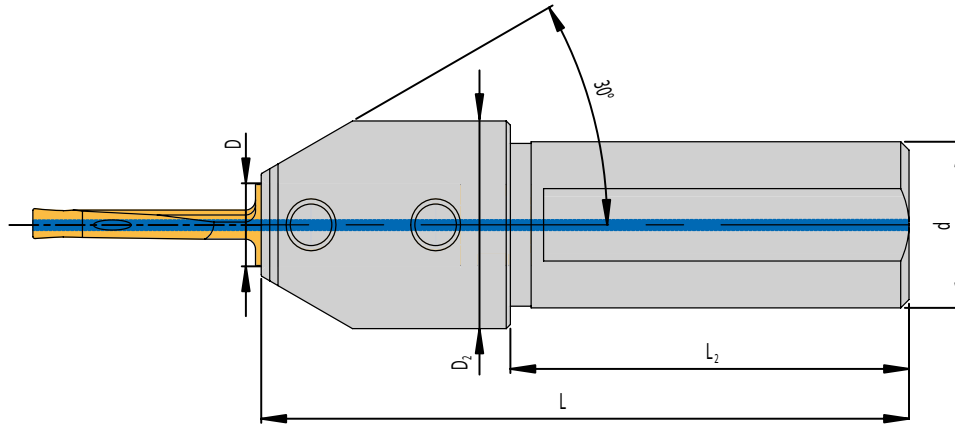
Tous les inserts de coupe AMS-... .60R peuvent être montés sur ces supports.

6

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--------------------------------------|----------------------|----------------------|
| <b>HAMS 12..06-R-GS</b>              | AS 0044              | KP 1111              |

## Axial grooving / Scanalatura assiale / Gorge axiale



## Holders / Adattatore / Porte-outils

| Designation<br>Articolo<br>Article | D  | D <sub>2</sub> | d  | L  | L <sub>2</sub> | Insert<br>Inserito<br>Insert |
|------------------------------------|----|----------------|----|----|----------------|------------------------------|
| HSAV 2006                          | 6  | 25             | 20 | 78 | 48             | SAV15... SAV20...            |
| HSAV 2008                          | 8  | 25             | 20 | 78 | 48             | SAV25... SAV30...            |
| HSAV 2010                          | 10 | 25             | 20 | 78 | 48             | SAV40...                     |
| HSAV 2508                          | 8  | 30             | 25 | 78 | 48             | SAV25... SAV30...            |
| HSAV 2510                          | 10 | 30             | 25 | 78 | 48             | SAV40...                     |

When face grooving into solid the overall groove depth can only be obtained in diameter range up to 50mm.

Con la scanalatura assiale dal pieno la profondità completa di scanalatura si ottiene solamente per una gamma di diametri fino a 50mm.

Lors de l'usinage de gorges axiales en pleine matière, la profondeur d'usinage n'est possible que jusqu'au diamètre de 50mm



The inserts for these holders you will find on pages 537 to 538.

Inseriti per questi adattatori a pagg. da 537 a 538.

Tous les inserts de coupe des pages 537 à 538 peuvent être montés sur ces supports.

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Screw<br>Vite<br>Vis |
|--------------------------------------|----------------------|
| HSAV ..06                            | DIN913 M5X10         |
| HSAV ..08 - HSAV ..10                | DIN913 M6X8          |

## HC - SOLID CARBIDE COATED

### HC – METALLO DURO RIVESTITO

### HC – CARBURE AVEC REVÊTEMENT

### AL40

- Universally applicable type
- Good degree of toughness
- Good wear resistance
- *Qualità utilizzabile universalmente*
- *Buona tenacità*
- *Buona resistenza all'usura*
- Nuance à usage universel
- Bonne ténacité
- Bonne résistance à l'usure

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



### AP5015

- Universally applicable type
- High thermal resistance
- High oxidation resistance
- *Qualità utilizzabile universalmente*
- *Elevata resistenza al calore*
- *Elevata resistenza all'ossidazione*
- Nuance à usage universel
- Grande résistance à la chaleur
- Grande résistance à l'oxydation

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



**HU - SOLID CARBIDE UNCOATED**  
**HU - METALLO DURO NON RIVESTITO**  
**HU - CARBURE SANS REVÊTEMENT**

**AK40**

- Good edge stability
- High reliability
- Fine grain solid carbide substrate
- Buona stabilità del profilo
- Elevata affidabilità
- Substrato in metallo duro a grana fine
- Bonne stabilité de l'arête
- Grande fiabilité
- En carbure micrograins



6

**BU – CBN UNCOATED**  
*BU – CBN NON RIVESTITO*  
**SANS REVÊTEMENT BU – CBN**

**AH7525**

- For smooth and interrupted cuts
- Tough CBN grade
- For machining hardened steels (48-65 HRC)
- *Adatto per tagli costanti e tagli interrotti*
- *Qualità CBN tenace*
- *Lavorazione di acciai temprati (48-65 HRC)*
- Pour une coupe continue ou interrompue
- Nuance CBN dure
- Usinage d'aciers trempés (48-65 HRC)

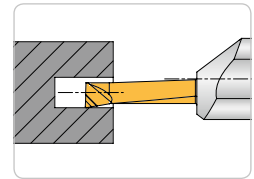
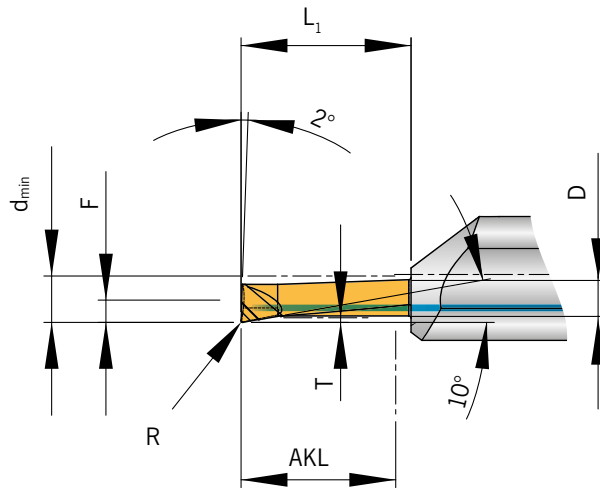


Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



Turning / Tornitura / Tournage



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T    | R    | F    | L <sub>1</sub> | D  | HC     |
|--|------------------|-----|------|------|------|----------------|----|--------|
|  |                  |     |      |      |      |                |    | AP5015 |
| AMS-D-07005005-020.40R                 | 0,7              | 2   | 0,05 | 0,05 | 0,30 | 4              | 4  | ◆      |
| AMS-D-20015002-060.40R                 | 2,0              | 6   | 0,15 | 0,02 | 0,90 | 8              | 4  | ◆      |
| AMS-D-20015002-100.40R                 | 2,0              | 10  | 0,15 | 0,02 | 0,90 | 12             | 4  | ◆      |
| AMS-D-220401-060.40R                   | 2,2              | 6   | 0,40 | 0,10 | 1,05 | 8              | 4  | ◆      |
| AMS-D-250401-100.40R                   | 2,5              | 10  | 0,40 | 0,10 | 1,15 | 12             | 4  | ◆      |
| AMS-D-250401-150.40R                   | 2,5              | 15  | 0,40 | 0,10 | 1,15 | 17             | 4  | ◆      |
| AMS-D-250401-200.40R                   | 2,5              | 20  | 0,40 | 0,10 | 1,15 | 22             | 4  | ◆      |
| AMS-D-300401-200.40R                   | 3,0              | 20  | 0,40 | 0,10 | 1,40 | 22             | 4  | ◆      |
| AMS-D-300402-150.40R                   | 3,0              | 15  | 0,40 | 0,20 | 1,40 | 17             | 4  | ◆      |
| AMS-D-300402-100.40R                   | 3,0              | 10  | 0,40 | 0,20 | 1,40 | 12             | 4  | ◆      |
| AMS-D-300402-200.40R                   | 3,0              | 20  | 0,40 | 0,20 | 1,40 | 22             | 4  | ◆      |
| AMS-D-300401-150.40R                   | 3,0              | 15  | 0,40 | 0,10 | 1,40 | 17             | 4  | ◆      |
| AMS-D-300401-100.40R                   | 3,0              | 10  | 0,40 | 0,10 | 1,40 | 12             | 4  | ◆      |
| AMS-D-390602-100.40R                   | 3,9              | 10  | 0,60 | 0,20 | 1,90 | 12             | 4  | ◆      |
| AMS-D-390602-150.40 L/R                | 3,9              | 15  | 0,60 | 0,20 | 1,90 | 17             | 4  | ◆      |
| AMS-D-390602-200.40 L/R                | 3,9              | 20  | 0,60 | 0,20 | 1,90 | 22             | 4  | ◆      |
| AMS-D-40015005-250.40 L/R              | 4,0              | 25  | 0,15 | 0,05 | 1,90 | 27             | 4  | ◆      |
| AMS-D-400301-250.40R                   | 4,0              | 25  | 0,30 | 0,10 | 1,90 | 27             | 4  | ◆      |
| AMS-D-590802-200.60 L/R                | 5,9              | 20  | 0,80 | 0,20 | 2,90 | 22             | 6  | ◆      |
| AMS-D-590804-200.60R                   | 5,9              | 20  | 0,80 | 0,40 | 2,90 | 22             | 6  | ◆      |
| AMS-D-590802-300.60 L/R                | 5,9              | 30  | 0,80 | 0,20 | 2,90 | 32             | 6  | ◆      |
| AMS-D-590801-150.60R                   | 5,9              | 15  | 0,80 | 0,10 | 2,90 | 17             | 6  | ◆      |
| AMS-D-590802-100.60R                   | 5,9              | 10  | 0,80 | 0,20 | 2,90 | 12             | 6  | ◆      |
| AMS-D-6005015-420.60R                  | 6,0              | 42  | 0,50 | 0,15 | 2,90 | 44             | 6  | ◆      |
| AMS-D-791002-100.80R                   | 7,9              | 10  | 1,00 | 0,20 | 3,90 | 12             | 8  | ◆      |
| AMS-D-791002-250.80 L/R                | 7,9              | 25  | 1,00 | 0,20 | 3,90 | 27             | 8  | ◆      |
| AMS-D-820402-300.80R                   | 8,2              | 30  | 0,40 | 0,20 | 3,90 | 32             | 8  | ◆      |
| AMS-D-1021002-200.100R                 | 10,2             | 20  | 1,00 | 0,20 | 4,90 | 22             | 10 | ◆      |
| AMS-D-1021002-300.100R                 | 10,2             | 30  | 1,00 | 0,20 | 4,90 | 32             | 10 | ◆      |

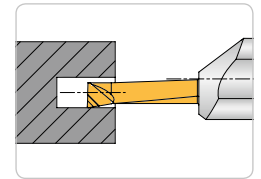
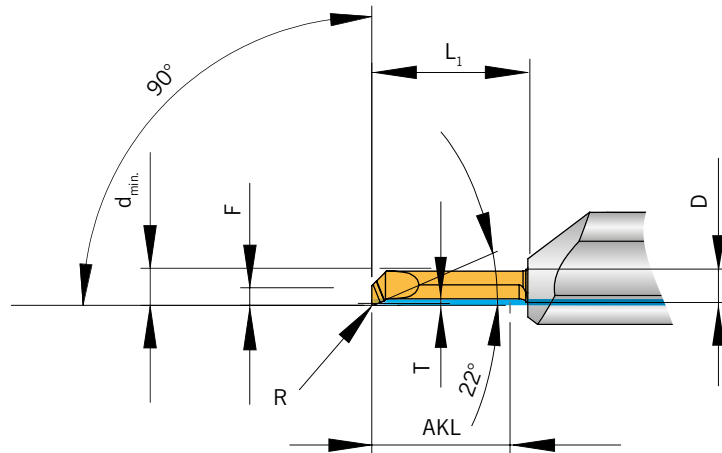
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H | ● |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

6

Turning / Tornitura / Tournage



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T    | R   | F   | L <sub>1</sub> | D | HC     |
|--|------------------|-----|------|-----|-----|----------------|---|--------|
|  |                  |     |      |     |     |                |   | AP5015 |
| AMS-D20-3001502-150.40R                | 3                | 15  | 0,15 | 0,2 | 1,3 | 17             | 4 | ◆      |
| AMS-D20-400302-150.40R                 | 4                | 15  | 0,30 | 0,2 | 1,9 | 17             | 4 | ◆      |
| AMS-D20-500502-100.60R                 | 5                | 10  | 0,50 | 0,2 | 2,3 | 12             | 6 | ◆      |
| AMS-D20-500502-150.60R                 | 5                | 15  | 0,50 | 0,2 | 2,3 | 17             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

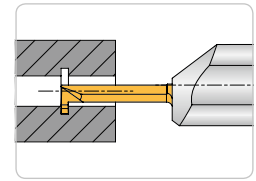
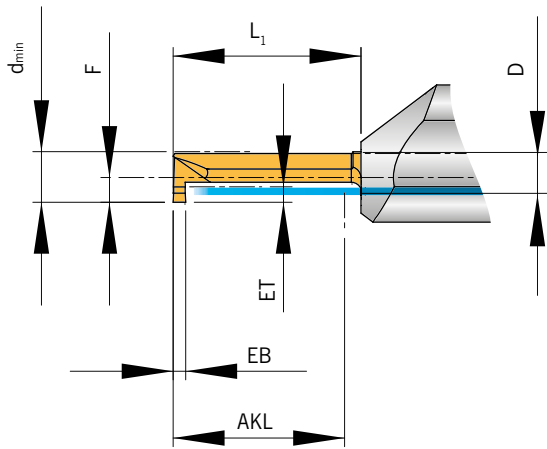
|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

6

Grooving / Scanalatura / Usinage de gorges



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | EB<br>+0,03 | ET  | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-------------|-----|------|----------------|---|--------|
|  |                  |     |             |     |      |                |   | AP5015 |
| AMS-S-25080600-100.40R                 | 2,5              | 10  | 0,8         | 0,6 | 1,15 | 12             | 4 | ◆      |
| AMS-S-25080600-150.40R                 | 2,5              | 15  | 0,8         | 0,6 | 1,15 | 17             | 4 | ◆      |
| AMS-S-25080600-200.40R                 | 2,5              | 20  | 0,8         | 0,6 | 1,15 | 22             | 4 | ◆      |
| AMS-S-30080600-100.40R                 | 3,0              | 10  | 0,8         | 0,6 | 1,40 | 12             | 4 | ◆      |
| AMS-S-30080600-150.40R                 | 3,0              | 15  | 0,8         | 0,6 | 1,40 | 17             | 4 | ◆      |
| AMS-S-30080600-200.40R                 | 3,0              | 20  | 0,8         | 0,6 | 1,40 | 22             | 4 | ◆      |
| AMS-S-39100800-100.40R                 | 3,9              | 10  | 1,0         | 0,8 | 1,90 | 12             | 4 | ◆      |
| AMS-S-39100800-150.40 L/R              | 3,9              | 15  | 1,0         | 0,8 | 1,90 | 17             | 4 | ◆      |
| AMS-S-39100800-200.40R                 | 3,9              | 20  | 1,0         | 0,8 | 1,90 | 22             | 4 | ◆      |
| AMS-S-59101800-200.60 L/R              | 5,9              | 20  | 1,0         | 1,8 | 2,90 | 22             | 6 | ◆      |
| AMS-S-59151800-100.60R                 | 5,9              | 10  | 1,5         | 1,8 | 2,90 | 12             | 6 | ◆      |
| AMS-S-59151800-200.60 L/R              | 5,9              | 20  | 1,5         | 1,8 | 2,90 | 22             | 6 | ◆      |
| AMS-S-59151800-300.60R                 | 5,9              | 30  | 1,5         | 1,8 | 2,90 | 32             | 6 | ◆      |
| AMS-S-69202500-150.80 L/R              | 6,9              | 15  | 2,0         | 2,5 | 3,90 | 17             | 8 | ◆      |
| AMS-S-79182500-100.80R                 | 7,9              | 10  | 1,8         | 2,5 | 3,90 | 12             | 8 | ◆      |
| AMS-S-79182500-250.80R                 | 7,9              | 25  | 1,8         | 2,5 | 3,90 | 27             | 8 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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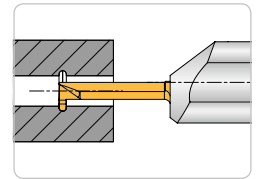
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



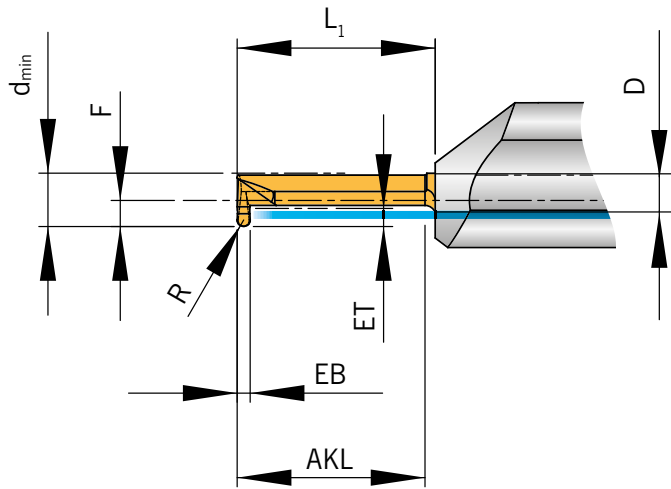


Grooving / Scanalatura / Usinage de gorges

Full radius grooving / Profilo a raggio pieno / Gorges rayonnées



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | EB<br>+ 0,03 | ET  | R    | F   | L <sub>1</sub> | D | HC     |
|--|------------------|-----|--------------|-----|------|-----|----------------|---|--------|
|  |                  |     |              |     |      |     |                |   | AP5015 |
| AMS-S-39100805-100.40R                 | 3,9              | 10  | 1,0          | 0,8 | 0,50 | 1,9 | 12             | 4 | ◆      |
| AMS-S-39100805-150.40 L/R              | 3,9              | 15  | 1,0          | 0,8 | 0,50 | 1,9 | 17             | 4 | ◆      |
| AMS-S-39100805-200.40R                 | 3,9              | 20  | 1,0          | 0,8 | 0,50 | 1,9 | 22             | 4 | ◆      |
| AMS-S-59151875-100.60R                 | 5,9              | 10  | 1,5          | 1,8 | 0,75 | 2,9 | 12             | 6 | ◆      |
| AMS-S-59151875-200.60R                 | 5,9              | 20  | 1,5          | 1,8 | 0,75 | 2,9 | 22             | 6 | ◆      |
| AMS-S-59151875-300.60R                 | 5,9              | 30  | 1,5          | 1,8 | 0,75 | 2,9 | 32             | 6 | ◆      |
| AMS-S-82202010-200.80R                 | 8,2              | 20  | 2,0          | 2,0 | 1,00 | 3,9 | 22             | 8 | ◆      |

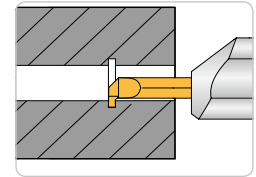
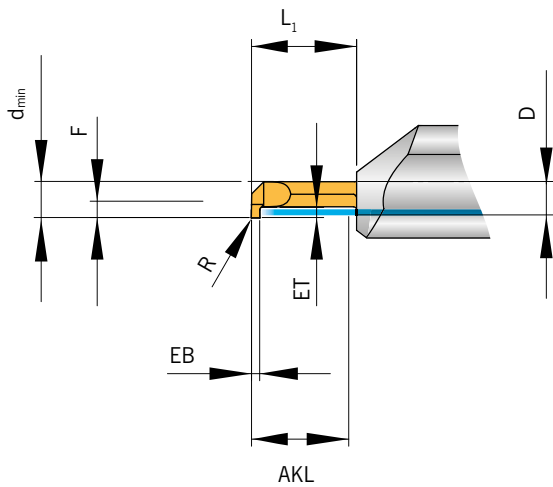
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

6

**Circlip grooving DIN 471/472 / Sedi Seeger DIN 471/472 /**  
Gorges de circlips DIN 471/472



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | EB<br>±0,025 | ET  | R    | F   | L <sub>1</sub> | D  | HC     |
|--|------------------|-----|--------------|-----|------|-----|----------------|----|--------|
|  |                  |     |              |     |      |     |                |    | AP5015 |
| AMS-472-41099110-150.40R               | 4,1              | 15  | 0,99         | 1,1 | 0,05 | 1,9 | 17             | 4  | ◆      |
| AMS-472-41119110-150.40R               | 4,1              | 15  | 1,19         | 1,1 | 0,05 | 1,9 | 17             | 4  | ◆      |
| AMS-472-41139110-150.40R               | 4,1              | 15  | 1,39         | 1,1 | 0,05 | 1,9 | 17             | 4  | ◆      |
| AMS-472-41169110-150.40R               | 4,1              | 15  | 1,69         | 1,1 | 0,05 | 1,9 | 17             | 4  | ◆      |
| AMS-472-61119150-150.60R               | 6,1              | 15  | 1,19         | 1,5 | 0,05 | 2,9 | 17             | 6  | ◆      |
| AMS-472-61194150-150.60R               | 6,1              | 15  | 1,94         | 1,5 | 0,05 | 2,9 | 17             | 6  | ◆      |
| AMS-472-61099150-150.60R               | 6,1              | 15  | 0,99         | 1,5 | 0,05 | 2,9 | 17             | 6  | ◆      |
| AMS-472-61139150-150.60R               | 6,1              | 15  | 1,39         | 1,5 | 0,05 | 2,9 | 17             | 6  | ◆      |
| AMS-472-61169150-150.60R               | 6,1              | 15  | 1,69         | 1,5 | 0,05 | 2,9 | 17             | 6  | ◆      |
| AMS-472-84274350-200.80R               | 8,4              | 20  | 2,74         | 3,5 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84224300-200.80R               | 8,4              | 20  | 2,24         | 3,0 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84194250-200.80R               | 8,4              | 20  | 1,94         | 2,5 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84169250-200.80R               | 8,4              | 20  | 1,69         | 2,5 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84139200-200.80R               | 8,4              | 20  | 1,39         | 2,0 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84328350-200.80R               | 8,4              | 20  | 3,28         | 3,5 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-84119200-200.80R               | 8,4              | 20  | 1,19         | 2,0 | 0,05 | 3,9 | 22             | 8  | ◆      |
| AMS-472-104169350-250.100R             | 10,4             | 25  | 1,69         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |
| AMS-472-104328350-250.100R             | 10,4             | 25  | 3,28         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |
| AMS-472-104274350-250.100R             | 10,4             | 25  | 2,74         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |
| AMS-472-104224350-250.100R             | 10,4             | 25  | 2,24         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |
| AMS-472-104194350-250.100R             | 10,4             | 25  | 1,94         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |
| AMS-472-104139350-250.100R             | 10,4             | 25  | 1,39         | 3,5 | 0,05 | 4,9 | 27             | 10 | ◆      |

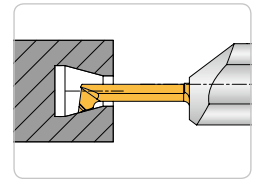
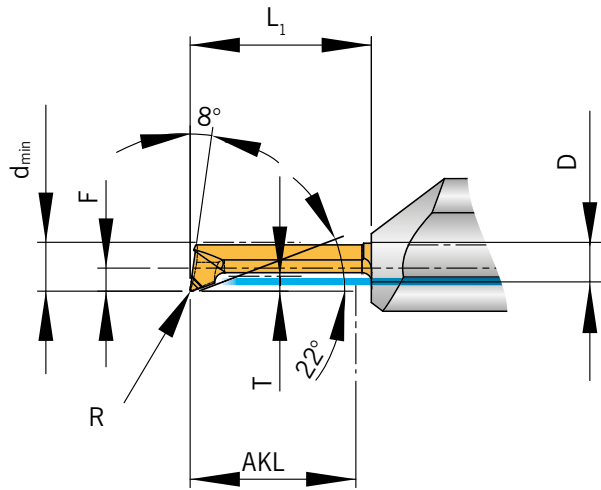
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
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| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



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Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



6

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T    | R    | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|------|------|------|----------------|---|--------|
|  |                  |     |      |      |      |                |   | AP5015 |
| AMS-K-1501005-110.40R                  | 1,5              | 11  | 0,10 | 0,05 | 1,30 | 12             | 4 | ◆      |
| AMS-K-1501501-060.40R                  | 1,5              | 6   | 0,15 | 0,10 | 1,30 | 7              | 4 | ◆      |
| AMS-K-2001005-150.40R                  | 2,0              | 15  | 0,10 | 0,05 | 0,90 | 17             | 4 | ◆      |
| AMS-K-20015005-100.40 L/R              | 2,0              | 10  | 0,10 | 0,05 | 0,90 | 11             | 4 | ◆      |
| AMS-K-2003005-060.40R                  | 2,0              | 6   | 0,30 | 0,05 | 0,90 | 7              | 4 | ◆      |
| AMS-K-2003005-100.40R                  | 2,0              | 10  | 0,30 | 0,05 | 0,90 | 11             | 4 | ◆      |
| AMS-K-220201-150.40R                   | 2,2              | 15  | 0,20 | 0,10 | 0,95 | 16             | 4 | ◆      |
| AMS-K-250401-100.40R                   | 2,5              | 10  | 0,40 | 0,10 | 1,15 | 12             | 4 | ◆      |
| AMS-K-250401-150.40R                   | 2,5              | 15  | 0,40 | 0,10 | 1,15 | 17             | 4 | ◆      |
| AMS-K-250401-200.40R                   | 2,5              | 20  | 0,40 | 0,10 | 1,15 | 22             | 4 | ◆      |
| AMS-K-300401-100.40R                   | 3,0              | 10  | 0,40 | 0,10 | 1,40 | 12             | 4 | ◆      |
| AMS-K-300401-150.40R                   | 3,0              | 15  | 0,40 | 0,10 | 1,40 | 17             | 4 | ◆      |
| AMS-K-300401-200.40 L/R                | 3,0              | 20  | 0,40 | 0,10 | 1,40 | 22             | 4 | ◆      |
| AMS-K-390802-150.40 L/R                | 3,9              | 15  | 0,80 | 0,20 | 1,90 | 17             | 4 | ◆      |
| AMS-K-390802-200.40 L/R                | 3,9              | 20  | 0,80 | 0,20 | 1,90 | 22             | 4 | ◆      |
| AMS-K-391304-200.40R                   | 3,9              | 20  | 1,30 | 0,40 | 1,90 | 22             | 4 | ◆      |
| AMS-K-390802-100.40R                   | 3,9              | 10  | 0,80 | 0,20 | 1,90 | 12             | 4 | ◆      |
| AMS-K-400602-200.40R                   | 4,0              | 20  | 0,60 | 0,20 | 1,90 | 22             | 4 | ◆      |
| AMS-K-400604-150.40R                   | 4,0              | 15  | 0,60 | 0,40 | 1,90 | 17             | 4 | ◆      |
| AMS-K-400604-120.40R                   | 4,0              | 12  | 0,60 | 0,40 | 1,90 | 14             | 4 | ◆      |
| AMS-K-400301-300.40R                   | 4,0              | 30  | 0,30 | 0,10 | 1,50 | 32             | 4 | ◆      |
| AMS-K-500502-100.60 L/R                | 5,0              | 10  | 0,50 | 0,20 | 2,30 | 12             | 6 | ◆      |
| AMS-K-500502-150.60R                   | 5,0              | 15  | 0,50 | 0,20 | 2,30 | 17             | 6 | ◆      |
| AMS-K-500502-200.60R                   | 5,0              | 20  | 0,50 | 0,20 | 2,30 | 22             | 6 | ◆      |
| AMS-K-500502-250.60 L/R                | 5,0              | 25  | 0,50 | 0,20 | 2,30 | 26             | 6 | ◆      |
| AMS-K-500502-300.60R                   | 5,0              | 30  | 0,50 | 0,20 | 2,30 | 31             | 6 | ◆      |
| AMS-K-590502-500.60R                   | 5,9              | 50  | 0,50 | 0,20 | 2,90 | 52             | 6 | ◆      |
| AMS-K-591802-300.60 L/R                | 5,9              | 30  | 1,80 | 0,20 | 2,90 | 32             | 6 | ◆      |
| AMS-K-591802-200.60R                   | 5,9              | 20  | 1,80 | 0,20 | 2,90 | 22             | 6 | ◆      |
| AMS-K-591802-100.60R                   | 5,9              | 10  | 1,80 | 0,20 | 2,90 | 12             | 6 | ◆      |
| AMS-K-590502-400.60R                   | 5,9              | 40  | 0,50 | 0,20 | 2,90 | 42             | 6 | ◆      |
| AMS-K-590502-350.60R                   | 5,9              | 35  | 0,50 | 0,20 | 2,90 | 37             | 6 | ◆      |
| AMS-K-6005015-420.60R                  | 6,0              | 42  | 0,50 | 0,15 | 2,30 | 44             | 6 | ◆      |
| AMS-K-6805005-250.80R <b>N</b>         | 6,8              | 25  | 0,50 | 0,05 | 3,90 | 27             | 8 | ◆      |
| AMS-K-680502-200.80L <b>N</b>          | 6,8              | 20  | 0,50 | 0,20 | 3,90 | 22             | 8 | ◆      |
| AMS-K-680502-250.80L <b>N</b>          | 6,8              | 25  | 0,50 | 0,20 | 3,90 | 27             | 8 | ◆      |

| Designation<br>Articolo<br>Désignation   | d <sub>min</sub> | AKL | T    | R    | F    | L <sub>1</sub> | D  | HC     |
|--|------------------|-----|------|------|------|----------------|----|--------|
|  |                  |     |      |      |      |                |    | AP5015 |
| AMS-K-720502-450.80R   | 7,2              | 45  | 0,50 | 0,20 | 3,45 | 47             | 8  | ◆      |
| AMS-K-791002-200.80R  | 7,9              | 20  | 1,00 | 0,20 | 3,90 | 22             | 8  | ◆      |
| AMS-K-791002-300.80R  | 7,9              | 30  | 1,00 | 0,20 | 3,90 | 32             | 8  | ◆      |
| AMS-K-791002-400.80R   | 7,9              | 40  | 1,00 | 0,20 | 3,90 | 42             | 8  | ◆      |
| AMS-K-800502-500.80R   | 8,0              | 50  | 0,50 | 0,20 | 3,90 | 52             | 8  | ◆      |
| AMS-K-893902-200.80R   | 8,9              | 20  | 3,90 | 0,20 | 3,90 | 22             | 8  | ◆      |
| AMS-K-893902-300.80R   | 8,9              | 30  | 3,90 | 0,20 | 3,90 | 32             | 8  | ◆      |
| AMS-K-1084902-350.100R   | 10,8             | 35  | 4,90 | 0,20 | 4,90 | 37             | 10 | ◆      |
| AMS-K-1084902-250.100R   | 10,8             | 25  | 4,90 | 0,20 | 4,90 | 27             | 10 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

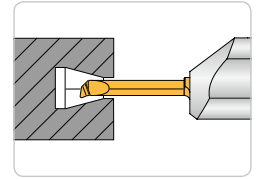
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| P | ● |
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● Main application  
Applicazione principale  
Application principale

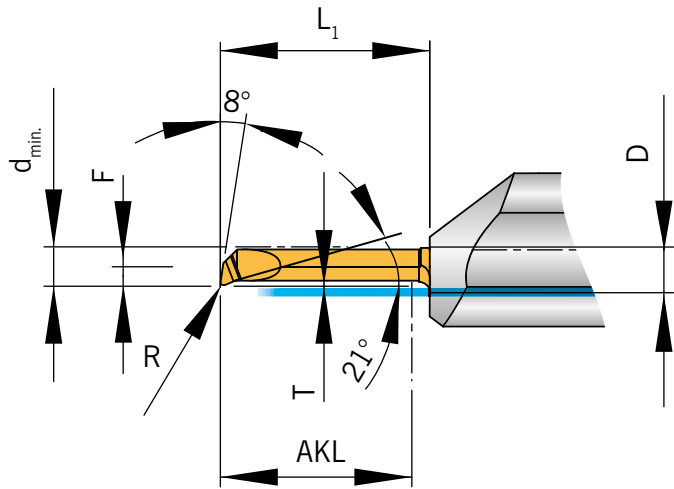
○ Secondary application  
Applicazione secondaria  
Application secondaire

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reinforced execution / versione rinforzata / modèle renforcé



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R    | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|------|------|----------------|---|--------|
|  |                  |     |     |      |      |                |   | AP5015 |
| AMS-K-300202-100.40 L/R                | 3,0              | 10  | 0,2 | 0,20 | 1,30 | 12             | 4 | ◆      |
| AMS-K-300202-150.40R                   | 3,0              | 15  | 0,2 | 0,20 | 1,30 | 17             | 4 | ◆      |
| AMS-K-3202015-100.40R                  | 3,2              | 10  | 0,2 | 0,15 | 1,45 | 12             | 4 | ◆      |
| AMS-K-400301-250.40R                   | 4,0              | 25  | 0,3 | 0,10 | 1,50 | 27             | 4 | ◆      |
| AMS-K-400302-100.40 L/R                | 4,0              | 10  | 0,3 | 0,20 | 1,90 | 12             | 4 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
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| N | ● |
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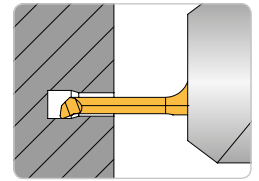
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

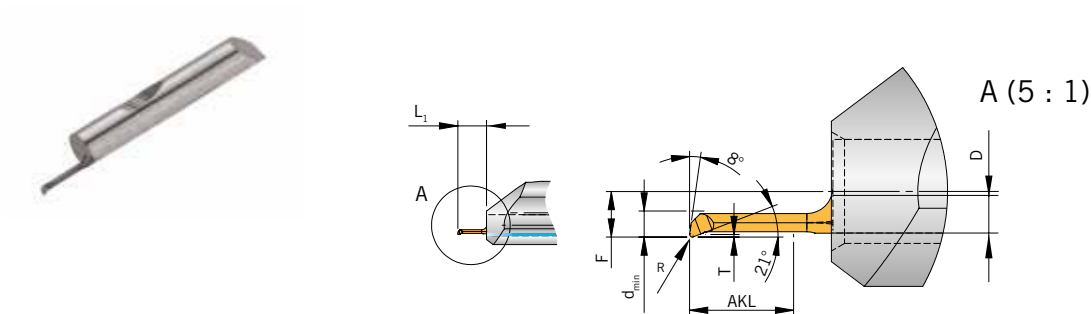
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**offset and reinforced version / versione disassata e rinforzata /**  
modèle décalé ou renforcé



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R   | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|-----|------|----------------|---|--------|
|  |                  |     |     |     |      |                |   | AP5015 |
| <b>AMS-K-100101-040.40R</b>            | 1                | 4   | 0,1 | 0,1 | 1,75 | 5,5            | 4 | ◆      |

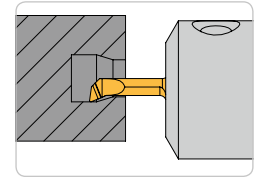
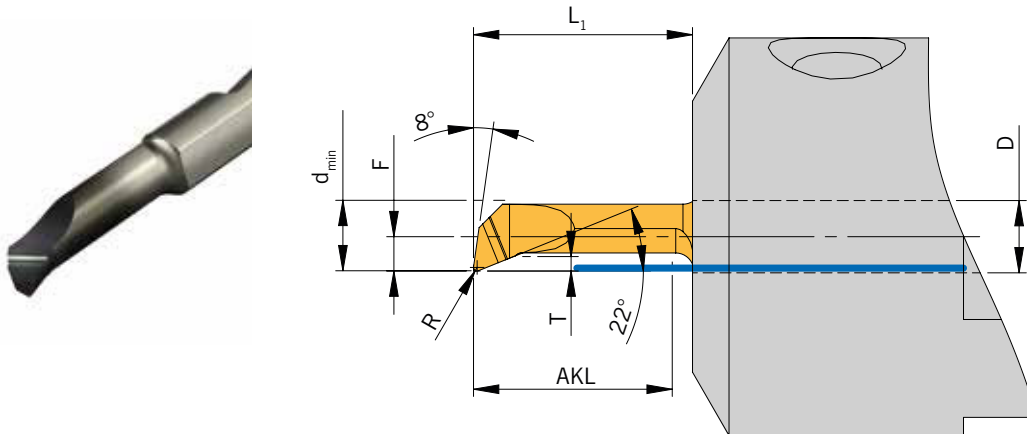
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



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Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R   | F   | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|-----|-----|----------------|---|--------|
|  |                  |     |     |     |     |                |   | AP5015 |
| AMS-US-K-390802-100.40R                | 3,9              | 10  | 0,8 | 0,2 | 1,9 | 12             | 4 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

These inserts only fits holders HAMS-US

Questi adattatori si adattano ai seguenti adattatore base: HAMS-US-...

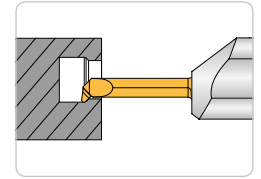
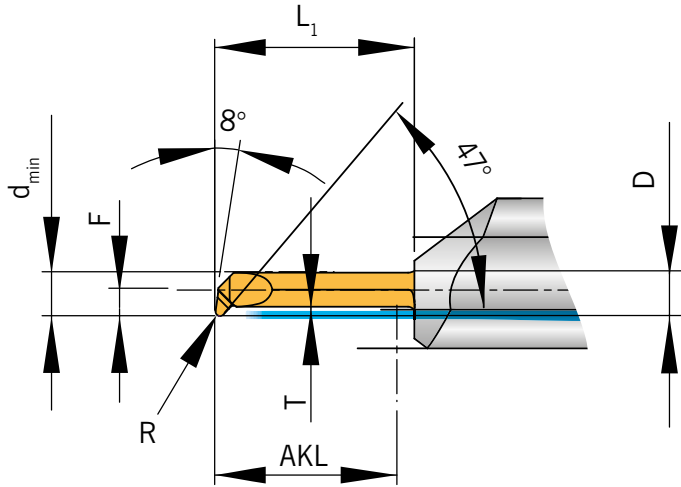
Ces inserts de coupe peuvent uniquement être montés sur le support suivant : HAMS-US-...

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|---|---|
| P | ● |
| M | ● |
| K | ● |
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| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

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Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R    | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|------|------|----------------|---|--------|
|  |                  |     |     |      |      |                |   | AP5015 |
| AMS-K45-3906015-200.40R                | 3,9              | 20  | 0,6 | 0,15 | 1,90 | 22             | 4 | ◆      |
| AMS-K45-391304-200.40R                 | 3,9              | 20  | 1,3 | 0,40 | 1,90 | 22             | 4 | ◆      |
| AMS-K45-400604-120.40R                 | 4,0              | 12  | 0,6 | 0,40 | 1,90 | 14             | 4 | ◆      |
| AMS-K45-400604-150.40R                 | 4,0              | 15  | 0,6 | 0,40 | 1,90 | 17             | 4 | ◆      |
| AMS-K45-4008015-200.40R                | 4,0              | 20  | 0,8 | 0,15 | 1,90 | 22             | 4 | ◆      |
| AMS-K45-5010015-250.60R                | 5,0              | 25  | 1,0 | 0,15 | 2,45 | 27             | 6 | ◆      |
| AMS-K45-5918015-150.60 L/R             | 5,9              | 15  | 1,8 | 0,15 | 2,90 | 17             | 6 | ◆      |
| AMS-K45-5918015-300.60R                | 5,9              | 30  | 1,8 | 0,15 | 2,90 | 32             | 6 | ◆      |
| AMS-K45-692902-100.60R                 | 6,9              | 10  | 2,9 | 0,20 | 2,90 | 12             | 6 | ◆      |
| AMS-K45-692902-150.60 L/R              | 6,9              | 15  | 2,9 | 0,20 | 2,90 | 17             | 6 | ◆      |
| AMS-K45-692902-200.60R                 | 6,9              | 20  | 2,9 | 0,20 | 2,90 | 22             | 6 | ◆      |
| AMS-K45-692902-300.60R                 | 6,9              | 30  | 2,9 | 0,20 | 2,90 | 32             | 6 | ◆      |
| AMS-K45-893902-150.80R                 | 8,9              | 15  | 3,9 | 0,20 | 3,90 | 17             | 8 | ◆      |
| AMS-K45-893902-200.80R                 | 8,9              | 20  | 3,9 | 0,20 | 3,90 | 22             | 8 | ◆      |
| AMS-K45-893902-300.80R                 | 8,9              | 30  | 3,9 | 0,20 | 3,90 | 32             | 8 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

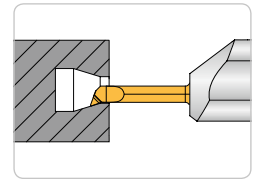
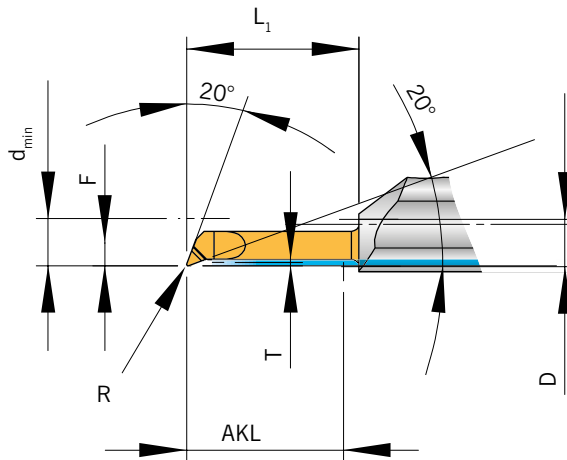
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire





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Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R   | F   | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|-----|-----|----------------|---|--------|
|  |                  |     |     |     |     |                |   | AP5015 |
| AMS-K2020-5005015-200.60 L/R           | 6                | 20  | 0,5 | 0,2 | 2,9 | 22             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

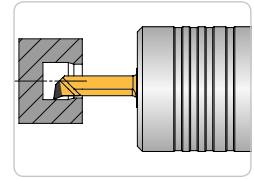
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● Main application  
Applicazione principale  
Application principale

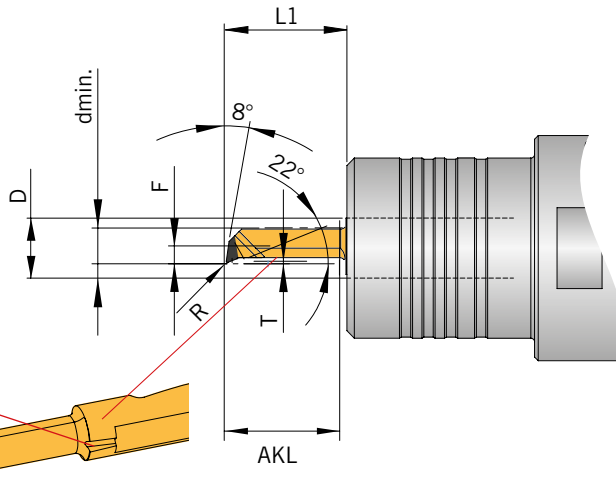
○ Secondary application  
Applicazione secondaria  
Application secondaire

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CBN brazed / riporto CBN / Insert CBN



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Additional groove for effective coolant supply for minimum diameter 3.0 mm / 4.0 mm and 5.0 mm  
Scanalatura supplementare per un efficace adduzione del refrigerante per Dia 3,0 mm / 4,0 mm e 5,0 mm  
Gorge supplémentaire pour une alimentation efficace en fluide de refroidissement avec dmin 3,0 mm / 4,0 mm et 5,0 mm

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | R   | F   | L <sub>1</sub> | D | BU     |
|--|------------------|-----|-----|-----|-----|----------------|---|--------|
|  |                  |     |     |     |     |                |   | AH7525 |
| AMS-K-300201-100.60R                   | 3                | 10  | 0,2 | 0,1 | 1,5 | 12             | 6 | ◆      |
| AMS-K-400302-130.60R                   | 4                | 13  | 0,3 | 0,2 | 2,0 | 15             | 6 | ◆      |
| AMS-K-500402-150.60R                   | 5                | 15  | 0,4 | 0,2 | 2,5 | 17             | 6 | ◆      |
| AMS-K-600402-180.60R                   | 6                | 18  | 0,4 | 0,2 | 3,0 | 20             | 6 | ◆      |

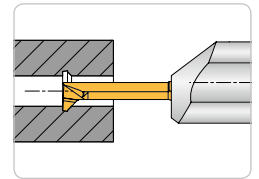
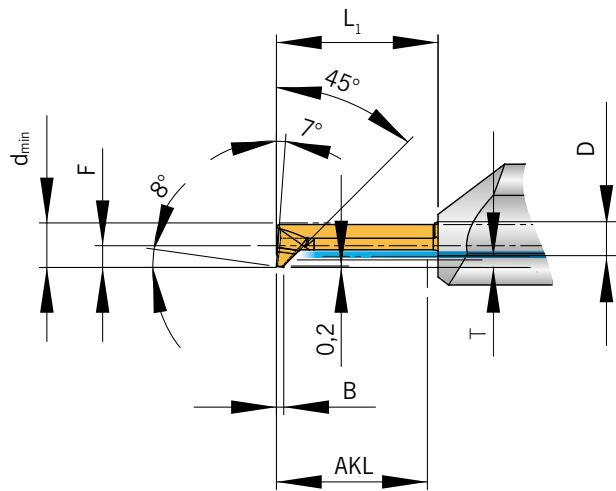
BU = CBN super hard cutting materials uncoated / materiali da taglio extra duri CBN non rivestiti / matériaux de coupe ultra-durs CBN sans revêtement

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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



Pre-grooving and chamfering / Pre-scanalatura e smusso /  
Ébauche et chanfreinage



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | T   | B<br>+ 0,03 | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|-----|-------------|-----|----------------|---|--------|
|                                    |                  |     |     |             |     |                |   | AP5015 |
| AMS-V-50100800-200.60R             | 5,0              | 20  | 0,8 | 1           | 2,4 | 22             | 6 | ◆      |
| AMS-V-59100800-200.60R             | 5,9              | 20  | 0,8 | 1           | 2,9 | 22             | 6 | ◆      |

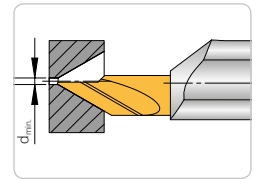
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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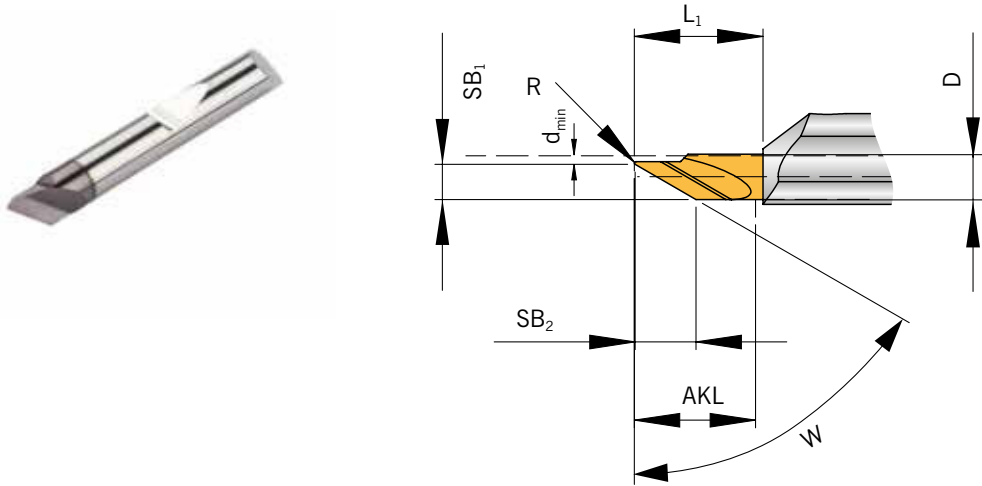
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

Centre Chamfering 45°/60° / Smussatura centrale 45°/60° / Chanfreinage centre 45°/60°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | SB <sub>1</sub> | SB <sub>2</sub> | W   | AKL | R   | F | L <sub>1</sub> | D | HC     |
|--|------------------|-----------------|-----------------|-----|-----|-----|---|----------------|---|--------|
|  |                  |                 |                 |     |     |     |   |                |   | AP5015 |
| AMS-ZF45-104502-150.60 L/R             | 1                | 4,5             | 4,5             | 45° | 15  | 0,2 | 2 | 17             | 6 | ◆      |
| AMS-ZF60-108002-150.60 L/R             | 1                | 4,5             | 7,9             | 60° | 15  | 0,2 | 2 | 17             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

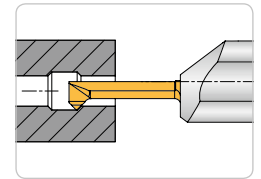
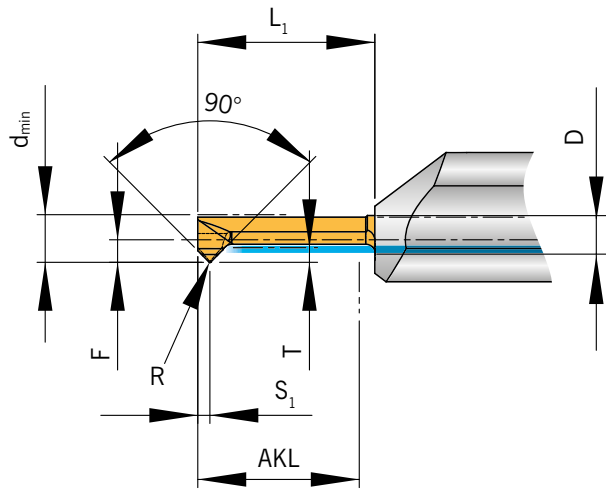
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire



Chamfering 45° / Smusso 45° / Chanfreinage 45°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL | T   | S <sub>1</sub> | R   | F    | L <sub>1</sub> | D | HC     |
|--|------------------|-----|-----|----------------|-----|------|----------------|---|--------|
|  |                  |     |     |                |     |      |                |   | AP5015 |
| AMS-F-250401-150.40R                   | 2,5              | 15  | 0,4 | 1,0            | 0,1 | 1,15 | 17             | 4 | ◆      |
| AMS-F-300401-150.40R                   | 3,0              | 15  | 0,4 | 1,0            | 0,1 | 1,40 | 17             | 4 | ◆      |
| AMS-F-390802-150.40R                   | 3,9              | 15  | 0,8 | 1,2            | 0,2 | 1,90 | 17             | 4 | ◆      |
| AMS-F-591802-200.60R                   | 5,9              | 20  | 1,8 | 2,0            | 0,2 | 2,90 | 22             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

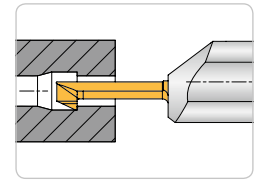
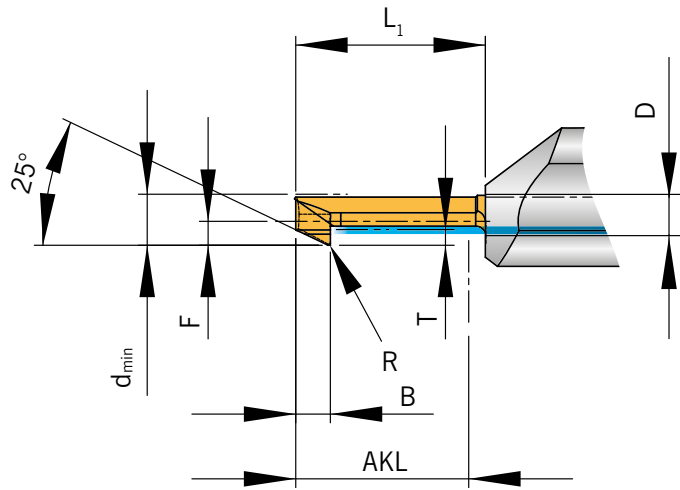
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| K | ● |
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

6

Back turning / Lavorazione in tirata / Tournage en tirant



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | T | B | R   | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|---|---|-----|-----|----------------|---|--------|
|                                    |                  |     |   |   |     |     |                |   | AP5015 |
| AMS-R-39401002-150.40R             | 3,9              | 15  | 1 | 4 | 0,2 | 1,9 | 17             | 4 | ◆      |
| AMS-R-59402002-200.60R             | 5,9              | 20  | 2 | 4 | 0,2 | 2,9 | 22             | 6 | ◆      |

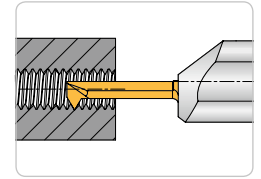
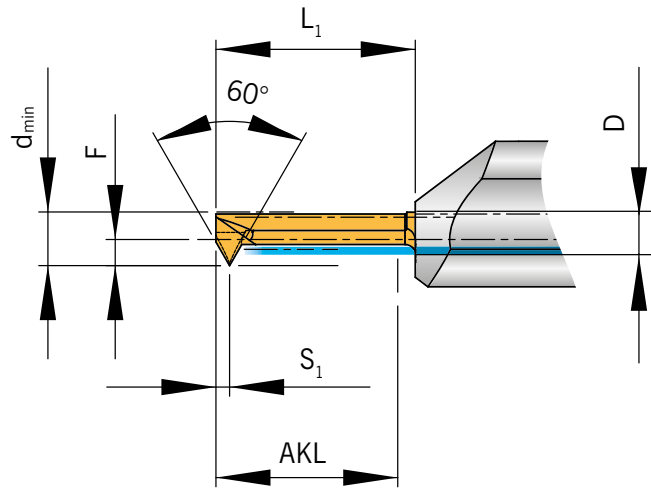
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

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| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

**Threading 60° / Filettatura 60° / Filetage 60°**

**Metric-partial profile / Metrica profilo parziale / Profil partiel métrique**



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | P Pitch<br>P Passo<br>P Pass | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|------------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                              |                |     |                |   | AP5015 |
| AMS-G-MF020050-050.40R             | 2,3              | 5   | >M2,5                                | 0,2 - 0,5                    | 0,45           | 1,1 | 6,5            | 4 | ◆      |
| AMS-G-MF050070-150.40R             | 3,0              | 15  | M4                                   | 0,5 - 0,7                    | 0,70           | 1,4 | 17,0           | 4 | ◆      |
| AMS-G-MF050100-150.40R             | 4,0              | 15  | M5                                   | 0,5 - 1                      | 0,70           | 1,9 | 17,0           | 4 | ◆      |
| AMS-G-MF050150-200.60R             | 6,0              | 20  | M8                                   | 0,5 - 1,5                    | 0,80           | 2,9 | 22,0           | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

MF – ISO-Metric – Fine / MF – Filettatura Metrica ISO – Passo Fine / MF = filetage intérieur ISO métrique fin

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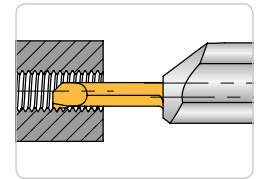
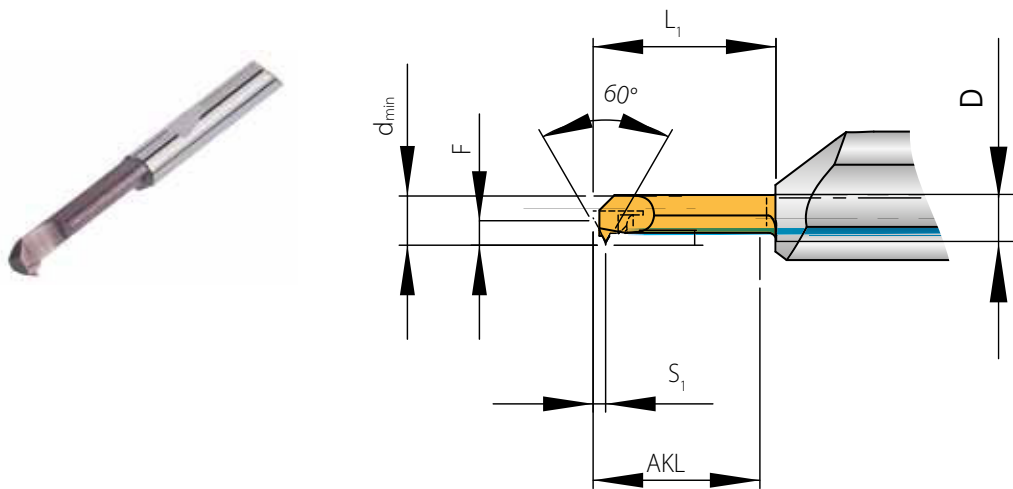
● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

6

**Threading 60° / Filettatura 60° / Filetage 60°**

**Metric-full profile / Metrica profilo completo / Profil complet métrique**



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | P Pitch<br>P Passo<br>P Pass | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|------------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                              |                |     |                |   | AP5015 |
| AMS-GV-MF025-150.40R               | 3,7              | 16  | M4,5                                 | 0,25                         | 0,4            | 1,9 | 18             | 4 | ◆      |
| AMS-GV-MF035-150.40R               | 3,7              | 16  | M4,5                                 | 0,35                         | 0,4            | 1,9 | 18             | 4 | ◆      |
| AMS-GV-MF050-150.40R               | 4,0              | 15  | MF                                   | 0,50                         | 0,4            | 1,9 | 17             | 4 | ◆      |
| AMS-GV-MF060-150.40R               | 4,0              | 15  | MF                                   | 0,60                         | 0,4            | 1,9 | 17             | 4 | ◆      |
| AMS-GV-MF070-150.40R               | 4,1              | 15  | MF                                   | 0,70                         | 0,5            | 1,9 | 17             | 4 | ◆      |
| AMS-GV-MF075-150.40R               | 4,2              | 15  | MF                                   | 0,75                         | 0,5            | 1,9 | 17             | 4 | ◆      |
| AMS-GV-M100-200.60R                | 4,8              | 20  | M6                                   | 1,00                         | 0,7            | 2,9 | 22             | 6 | ◆      |
| AMS-GV-M100-150.40R                | 5,0              | 15  | M6                                   | 1,00                         | 0,7            | 1,9 | 17             | 4 | ◆      |
| AMS-GV-MF025-150.60R               | 5,1              | 16  | M4                                   | 0,25                         | 0,4            | 2,5 | 18             | 6 | ◆      |
| AMS-GV-MF080-150.60R               | 5,3              | 16  | M6                                   | 0,80                         | 0,5            | 2,6 | 18             | 6 | ◆      |
| AMS-GV-MF050-150.60R               | 5,4              | 15  | MF                                   | 0,50                         | 0,4            | 2,5 | 17             | 6 | ◆      |
| AMS-GV-MF075-150.60R               | 5,6              | 15  | MF                                   | 0,75                         | 0,5            | 2,6 | 17             | 6 | ◆      |
| AMS-GV-M100-150.60R                | 5,7              | 15  | M10                                  | 1,00                         | 0,7            | 2,6 | 17             | 6 | ◆      |
| AMS-GV-M125-200.60R                | 6,0              | 20  | M8                                   | 1,25                         | 0,8            | 2,9 | 22             | 6 | ◆      |
| AMS-GV-M150-200.60R                | 6,0              | 20  | M12                                  | 1,50                         | 1,0            | 2,9 | 22             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
MF – ISO-Metric – Fine / MF – Filettatura Metrica ISO – Passo Fine / MF = filetage intérieur ISO métrique fin

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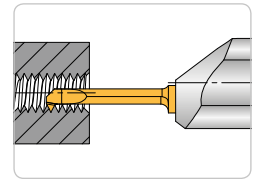
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



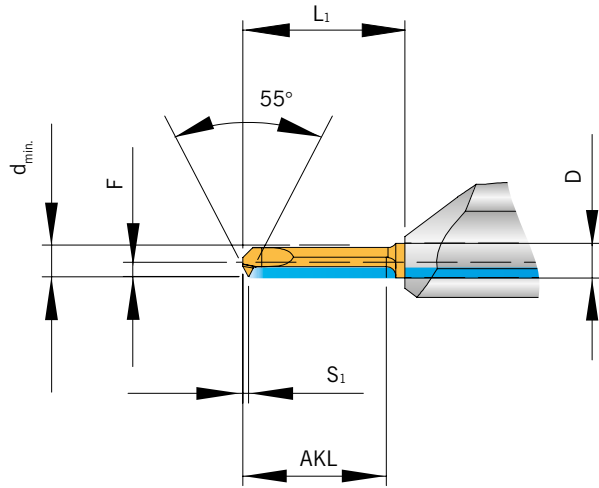


**Whitworth thread 55° / Filettatura Whitworth 55° / Filetage 55°**  
Whitworth

Partial profile / Profilo parziale / Profil partiel



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | P Pitch<br>P Passo<br>P Pass | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|------------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                              |                |     |                |   | AP5015 |
| AMS-G-WF33025100-150.40R           | 3,3              | 15  | WF                                   | 0,25 - 1                     | 0,6            | 1,5 | 17             | 4 | ◆      |
| AMS-G-WF43025100-150.40R           | 4,3              | 15  | WF                                   | 0,25 - 1                     | 0,6            | 1,9 | 17             | 4 | ◆      |
| AMS-G-WF60050150-150.60R           | 6,0              | 15  | WF                                   | 0,50 - 1.5                   | 0,8            | 2,9 | 17             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
MF – ISO-Metric – Fine / MF – Filettatura Metrica ISO – Passo Fine / MF = filetage intérieur ISO métrique fin

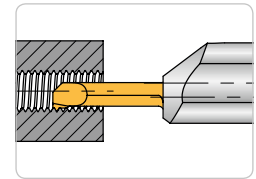
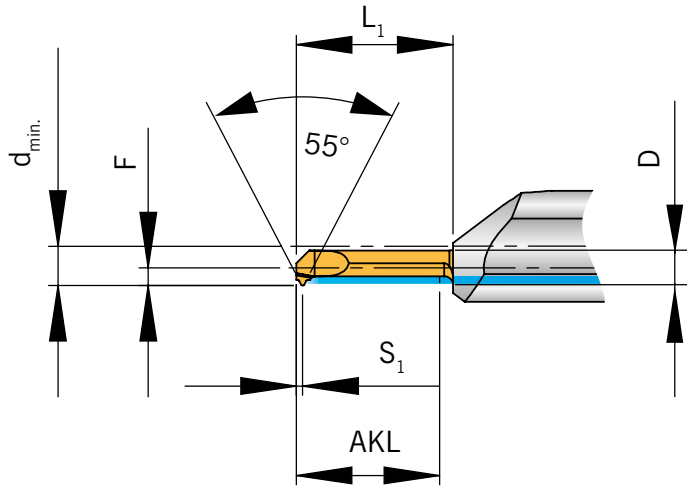
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

6

**Whitworth thread 55° / Filettatura Whitworth 55° /**  
Filetage 55° Whitworth

**DIN ISO 228 - full profile / DIN ISO 228 - profilo completo / DIN ISO 228 - profil complet**



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | P Pitch<br>P Passo<br>P Pass | TPI<br>G/Inch<br>G/Inch | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|------------------------------|-------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                              |                         |                |     |                |   | AP5015 |
| AMS-GV-W228/20-150.40R             | 4                | 15  | W228                                 | 1,27                         | 20                      | 0,70           | 1,9 | 17             | 4 | ◆      |
| AMS-GV-W228/19-150.60R             | 11               | 15  | 1/4"-19 BSP                          | 1,33                         | 19                      | 0,95           | 2,9 | 17             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

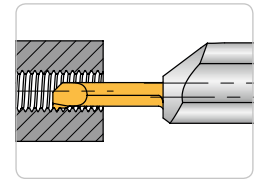
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

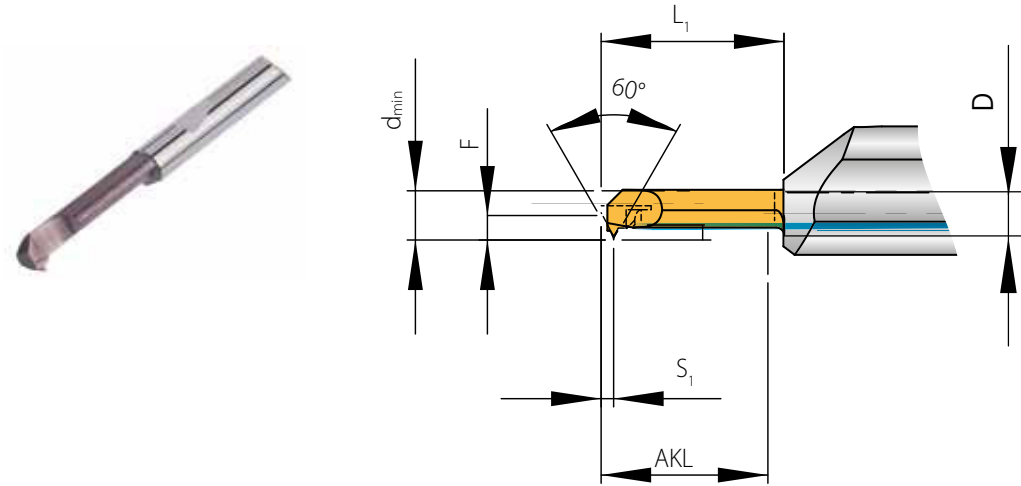


**Whitworth pipe thread 55° BSW / Filettatura Whitworth 55° BSW /**  
Filetage tubulaire Whitworth 55° BSW

Full profil / Profilo completo / Profil complet



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | TPI<br>G/Inch<br>G/Inch | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|-------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                         |                |     |                |   | AP5015 |
| AMS-GV-BSW24-150.60R               | 3,4              | 15  | 3/16"-24BSW                          | 24                      | 0,75           | 0,3 | 17             | 6 | ◆      |
| AMS-GV-BSW24-150.40R               | 3,4              | 15  | 3/16"-24BSW                          | 24                      | 0,75           | 1,3 | 17             | 4 | ◆      |
| AMS-GV-BSW28-150.60R               | 4,4              | 15  | 7/32"-28BSW                          | 28                      | 0,65           | 1,2 | 17             | 6 | ◆      |
| AMS-GV-BSW22-150.60R               | 6,5              | 15  | 5/16"-22BSW                          | 22                      | 0,90           | 2,9 | 17             | 6 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

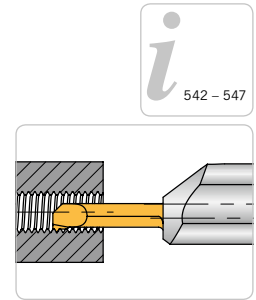
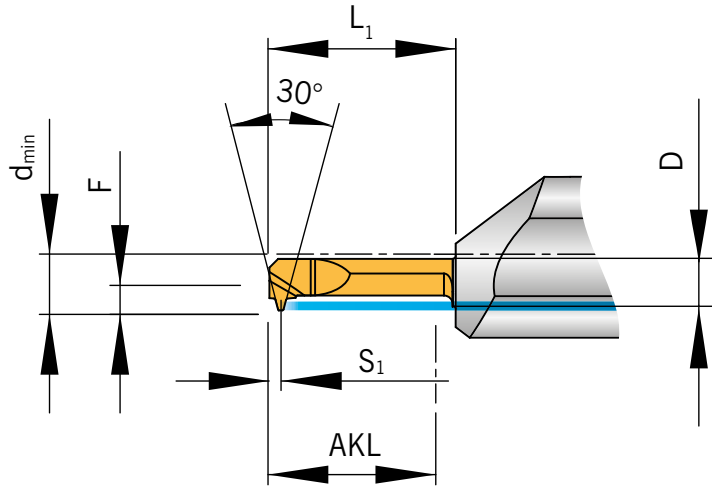
|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

6

**Trapezoidal thread 30° / Filettatura trapezoidale 30° /**  
Filetage trapézoïdal 30°

**DIN ISO 103 - partial profile / DIN ISO 103 - profilo parziale / DIN ISO 103 - profil partiel**



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | P Pitch<br>P Passo<br>P Pass | S <sub>1</sub> | F   | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|------------------------------|----------------|-----|----------------|---|--------|
|                                    |                  |     |                                      |                              |                |     |                |   | AP5015 |
| AMS-G-TR103/1.5R-200.60R           | 6,5              | 20  | TR 8x1.5                             | 1,5                          | 0,85           | 2,9 | 22             | 6 | ◆      |
| AMS-G-TR103/2.0R-200.60R           | 7,0              | 20  | TR 9x2.0                             | 2,0                          | 1,30           | 2,9 | 22             | 6 | ◆      |
| AMS-G-TR103/2.0R-200.80R           | 7,0              | 20  | TR 9x2.0                             | 2,0                          | 1,30           | 2,6 | 22             | 8 | ◆      |
| AMS-G-TR103/3.0R-200.80R           | 8,0              | 20  | TR 11x3.0                            | 3,0                          | 1,40           | 3,6 | 22             | 8 | ◆      |

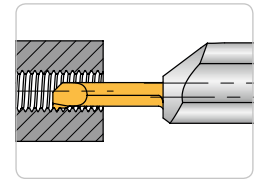
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

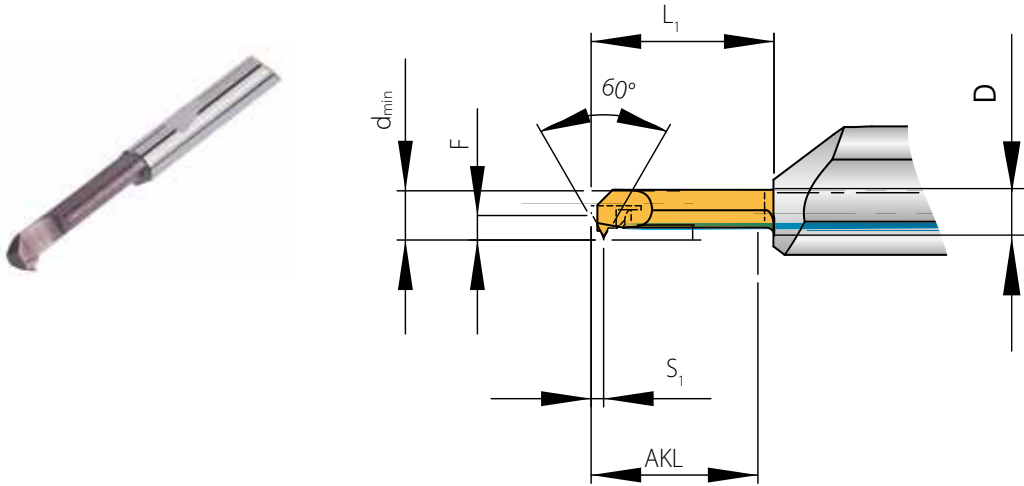
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

**American thread 60° - UN / Filettatura norme americane 60° - UN / Filetage ISO en pouce américain 60° - UN**

**Full profil / Profilo completo / Profil complet**



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



| Designation<br>Articolo<br>Article | d <sub>min</sub> | AKL | Threading<br>Filettatura<br>Filetage | TPI<br>G/Inch<br>G/Inch | S <sub>1</sub> | F     | L <sub>1</sub> | D | HC     |
|------------------------------------|------------------|-----|--------------------------------------|-------------------------|----------------|-------|----------------|---|--------|
|                                    |                  |     |                                      |                         |                |       |                |   | AP5015 |
| AMS-GV-UN32-110.40R                | 2,35             | 12  | No.6-32 UNC                          | 32                      | 0,60           | 0,45  | 17             | 4 | ◆      |
| AMS-GV-UN32-150.40R                | 2,60             | 16  | No.6-32 UNC                          | 32                      | 0,60           | 0,45  | 17             | 4 | ◆      |
| AMS-GV-UN32-150.60R                | 2,60             | 16  | No.6-32 UNC                          | 32                      | 0,60           | -0,55 | 17             | 6 | ◆      |
| AMS-GV-UN24-150.40R                | 3,60             | 16  | No.10-24 UNC                         | 24                      | 0,75           | 1,40  | 17             | 4 | ◆      |
| AMS-GV-UN24-150.60R                | 3,60             | 16  | No.10-24 UNC                         | 24                      | 0,75           | 0,40  | 17             | 6 | ◆      |
| AMS-GV-UN28-150.40R                | 4,40             | 16  | No.12-28 UNF                         | 28                      | 0,65           | 1,90  | 17             | 4 | ◆      |
| AMS-GV-UN20-150.60R                | 4,80             | 16  | 1/4"-20 UNC                          | 20                      | 0,90           | 1,50  | 17             | 6 | ◆      |
| AMS-GV-UN27-150.60R                | 5,30             | 16  | 1/4"-27 UNS                          | 27                      | 0,75           | 1,90  | 17             | 6 | ◆      |
| AMS-GV-UN18-150.60R                | 6,20             | 16  | 5/16"-18 UNC                         | 18                      | 1,00           | 2,90  | 17             | 6 | ◆      |
| AMS-GV-UN16-150.60R                | 7,60             | 16  | 3/8"-16 UNC                          | 16                      | 1,05           | 2,90  | 17             | 6 | ◆      |

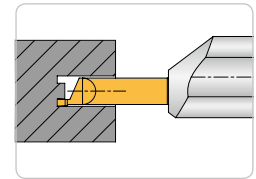
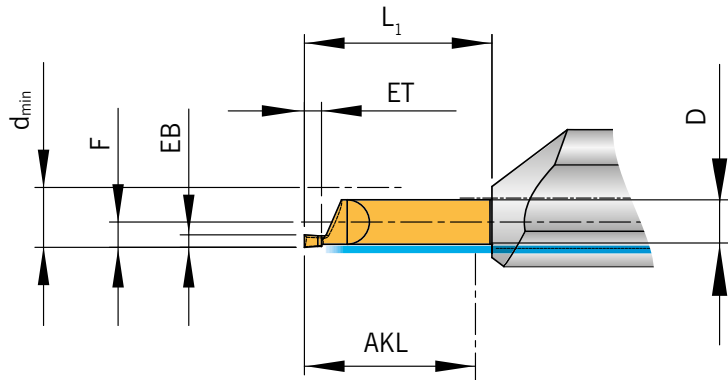
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

6

Axial grooving / Scanalatura assiale / Gorge axiale



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | AKL  | EB   | ET  | R    | F   | L <sub>1</sub> | D | HC     |
|--|------------------|------|------|-----|------|-----|----------------|---|--------|
|  |                  |      |      |     |      |     |                |   | AP5015 |
| AMS-A-50071100-075.40R                 | 5                | 7,5  | 0,70 | 1,1 | -    | 1,9 | 9,7            | 4 | ◆      |
| AMS-A-5007711005-075.40R               | 5                | 7,5  | 0,77 | 1,1 | 0,05 | 1,9 | 9,7            | 4 | ◆      |
| AMS-A-50081200-075.40R                 | 5                | 7,5  | 0,80 | 1,2 | -    | 1,9 | 9,7            | 4 | ◆      |
| AMS-A-50091300-075.40R                 | 5                | 7,5  | 0,90 | 1,3 | -    | 1,9 | 9,7            | 4 | ◆      |
| AMS-A-50101500-075.40R                 | 5                | 7,5  | 1,00 | 1,5 | -    | 1,9 | 10,0           | 4 | ◆      |
| AMS-A-50121500-075.40R                 | 5                | 7,5  | 1,20 | 1,5 | -    | 1,9 | 10,0           | 4 | ◆      |
| AMS-A-50121500-150.40R                 | 5                | 15,0 | 1,20 | 1,5 | -    | 1,9 | 17,0           | 4 | ◆      |
| AMS-A-502050005-100.40 L/R             | 5                | 10,0 | 2,00 | 5,0 | 0,05 | 1,9 | 12,0           | 4 | ◆      |
| AMS-A-600971500-100.60R                | 6                | 10,0 | 0,97 | 1,5 | -    | 2,4 | 12,0           | 6 | ◆      |
| AMS-A-60121500-100.60R                 | 6                | 10,0 | 1,20 | 1,5 | -    | 2,4 | 12,0           | 6 | ◆      |
| AMS-A-60121500-180.60R                 | 6                | 18,0 | 1,20 | 1,5 | -    | 2,4 | 20,0           | 6 | ◆      |
| AMS-A-70152000-100.60R                 | 7                | 10,0 | 1,50 | 2,0 | -    | 2,9 | 12,0           | 6 | ◆      |
| AMS-A-70152000-200.60R                 | 7                | 20,0 | 1,50 | 2,0 | -    | 2,9 | 22,0           | 6 | ◆      |
| AMS-A-801530015-100.80R                | 8                | 10,0 | 1,50 | 3,0 | 0,15 | 2,0 | 12,0           | 8 | ◆      |
| AMS-A-90152000-100.80R                 | 9                | 10,0 | 1,50 | 2,0 | -    | 3,8 | 12,0           | 8 | ◆      |
| AMS-A-90152000-250.80R                 | 9                | 25,0 | 1,50 | 2,0 | -    | 3,8 | 27,0           | 8 | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ● |
| N | ● |
| S | ● |
| H |   |

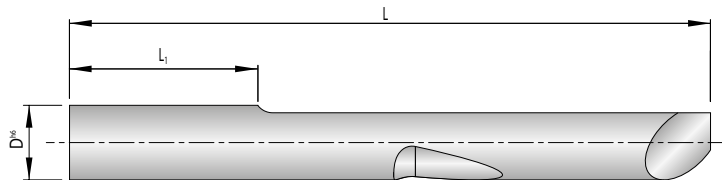
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



Blanks fo special profiles / Semilavorato per la realizzazione di speciali / Produits semi-finis pour profilage spécial



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



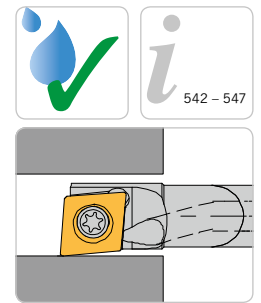
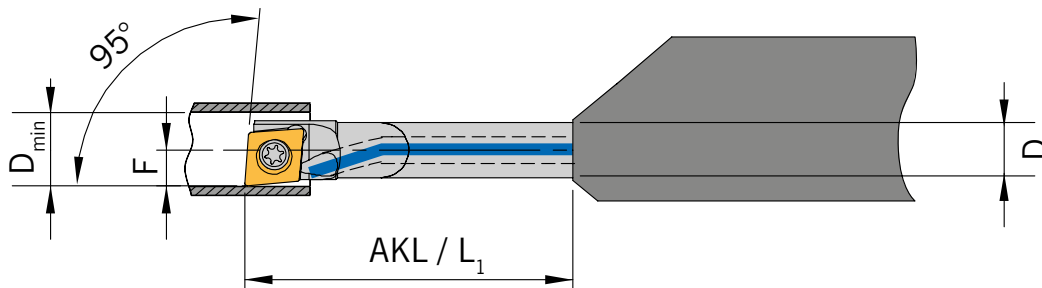
6

| Designation<br>Articolo<br>Désignation | D <sub>h6</sub> | L    | L <sub>1</sub> | HU |
|--|-----------------|------|----------------|----|
| H-AMS-100-40 L/R                       | 4               | 34,4 | 10             | ◆  |
| H-AMS-150-40 L/R                       | 4               | 39,4 | 15             | ◆  |
| H-AMS-200-40 L/R                       | 4               | 44,4 | 20             | ◆  |
| H-AMS-250-40 L/R                       | 4               | 49,4 | 25             | ◆  |
| H-AMS-100-60 L/R                       | 6               | 40,6 | 10             | ◆  |
| H-AMS-150-60 L/R                       | 6               | 45,6 | 15             | ◆  |
| H-AMS-200-60 L/R                       | 6               | 50,6 | 20             | ◆  |
| H-AMS-250-60 L/R                       | 6               | 55,6 | 25             | ◆  |
| H-AMS-300-60 L/R                       | 6               | 60,6 | 30             | ◆  |
| H-AMS-350-60R                          | 6               | 65,6 | 35             | ◆  |
| H-AMS-400-60R                          | 6               | 70,6 | 40             | ◆  |
| H-AMS-450-60R                          | 6               | 75,6 | 45             | ◆  |
| H-AMS-500-60R                          | 6               | 80,6 | 50             | ◆  |
| H-AMS-100-80R                          | 8               | 40,4 | 10             | ◆  |
| H-AMS-150-80 L/R                       | 8               | 45,4 | 15             | ◆  |
| H-AMS-200-80 L/R <b>N</b>              | 8               | 50,4 | 20             | ◆  |
| H-AMS-250-80 L/R                       | 8               | 55,4 | 25             | ◆  |
| H-AMS-300-80R                          | 8               | 60,4 | 30             | ◆  |
| H-AMS-450-80R                          | 8               | 75,4 | 45             | ◆  |
| H-AMS-500-80R                          | 8               | 80,4 | 50             | ◆  |
| H-AMS-200-100R                         | 10              | 50,4 | 20             | ◆  |
| H-AMS-250-100R                         | 10              | 55,4 | 25             | ◆  |
| H-AMS-300-100R                         | 10              | 60,4 | 30             | ◆  |
| H-AMS-350-100R                         | 10              | 65,4 | 35             | ◆  |

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbone sans revêtement

Note: special shapes according to customer drawings on request. / Nota: forme speciali su disegno del cliente su richiesta. / Remarque: formes spéciales selon dessins du client sur demande.

## SCLD L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

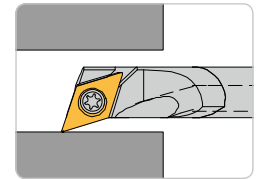
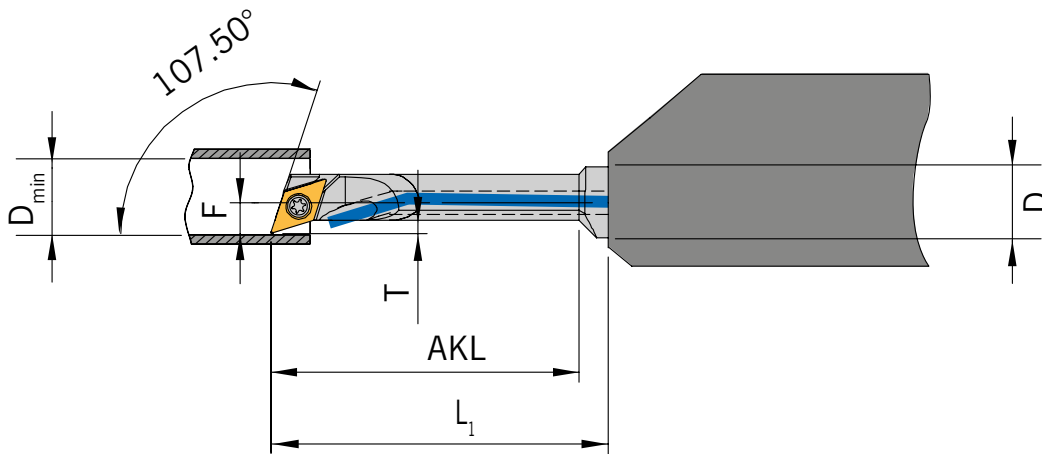
| Designation<br>Articolo<br>Article | $d_{min}$ | F   | $L_1$ | D | AKL  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----------|-----|-------|---|------|-----------------------------|
| E04-SCLDR04-AMS                    | 4,8       | 2,4 | 24,0  | 4 | 24,0 | CD.. 040102...              |
| E06-SCLDR04-AMS                    | 6,8       | 3,4 | 37,7  | 6 | 37,7 | CD.. 040102...              |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E...-SCLDR04-AMS                  | T1,8.03              | KS 1886              |



## SDQC L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

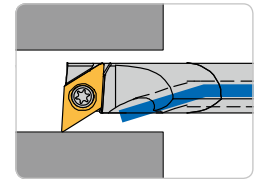
| Designation<br>Articolo<br>Article | $d_{min}$ | T   | F   | $L_1$ | D | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-----------|-----|-----|-------|---|-----|-----------------------------|
| E0406-SDQCR04-AMS                  | 5,2       | 1,1 | 2,6 | 28,5  | 6 | 26  | DC.. 04T0...                |
| E0408-SDQCR04-AMS                  | 5,2       | 1,1 | 2,6 | 29,5  | 8 | 26  | DC.. 04T0...                |

### Spare Parts / Ricambi / Pièces de rechange

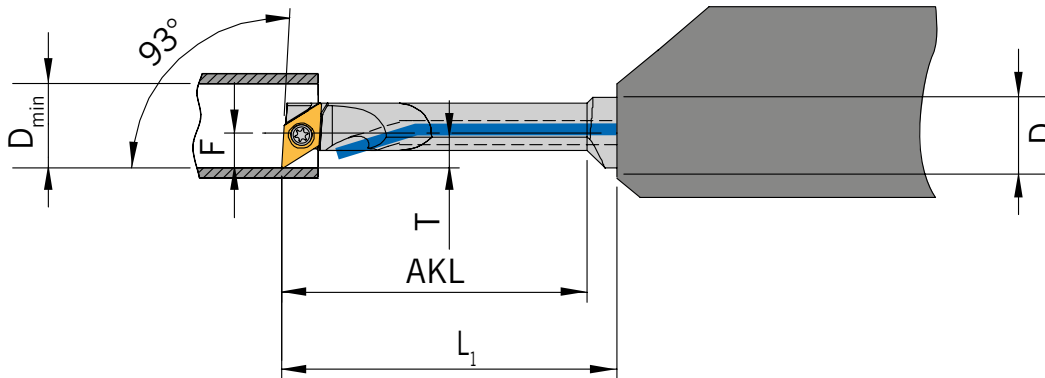
| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E...-SDQCR04-AMS                  | AS 0112              | KS 2505              |

6

## SDUC L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



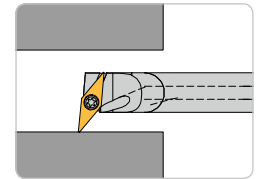
### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $d_{min}$ | T   | F | $L_1$ | D | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-----------|-----|---|-------|---|-----|-----------------------------|
| E0406-SDUCR04-AMS                  | 5,6       | 1,5 | 3 | 28,5  | 6 | 26  | DC.. 04T0...                |
| E0408-SDUCR04-AMS                  | 5,6       | 1,5 | 3 | 29,5  | 8 | 26  | DC.. 04T0...                |

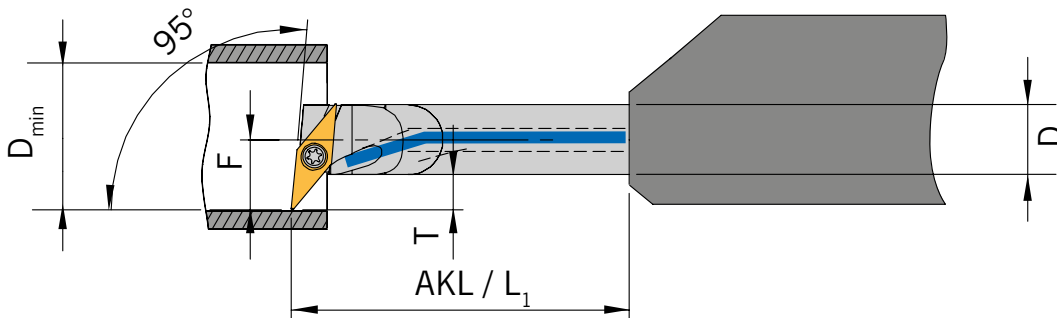
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E04...-SDUCR04-AMS                | AS 0112              | KS 2505              |

## SVLC L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Utensili / Porte-outils

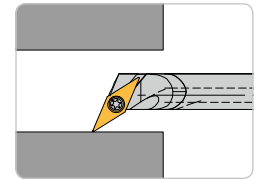
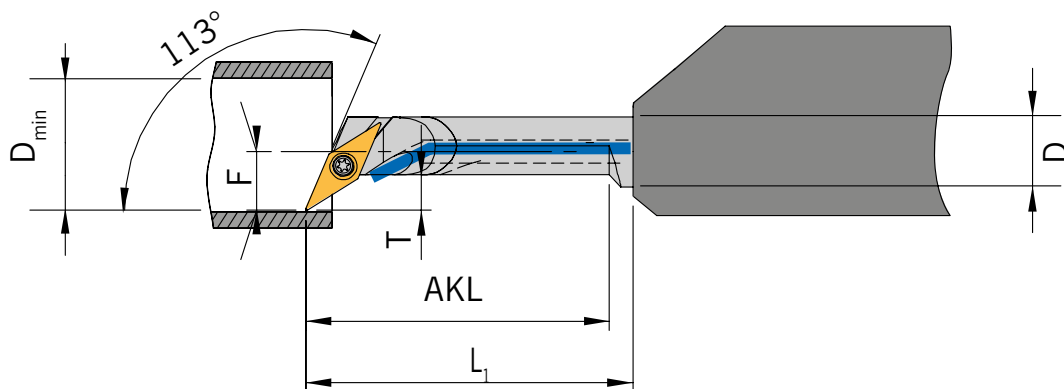
| Designation<br>Articolo<br>Article | $d_{min}$ | T | F | $L_1$ | D | AKL | Insert<br>Insero<br>Insert |
|------------------------------------|-----------|---|---|-------|---|-----|----------------------------|
| E0406-SVLCR05-AMS                  | 9,2       | 3 | 6 | 29    | 6 | 29  | VC.. 0501...               |
| E0408-SVLCR05-AMS                  | 9,2       | 3 | 5 | 29    | 8 | 26  | VC.. 0501...               |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E04...-SVLCR05-AMS                | AS 0113              | KS 2505              |

6

## SVXC L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

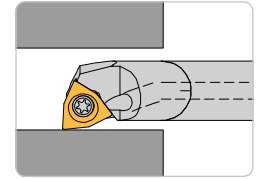
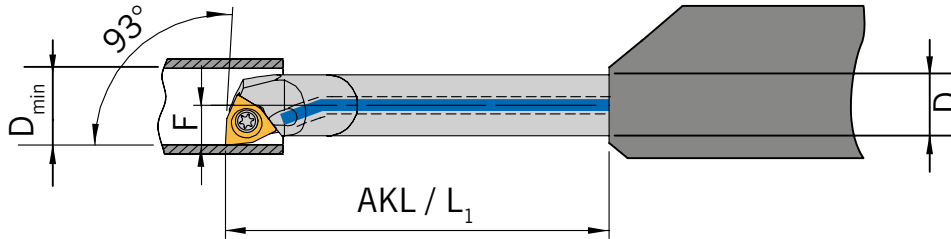
### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $d_{min}$ | T | F | $L_1$ | D | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-----------|---|---|-------|---|-----|-----------------------------|
| E0406-SVXCR05-AMS                  | 8,2       | 3 | 5 | 28    | 6 | 26  | VC.. 0501...                |
| E0408-SVXCR05-AMS                  | 9,2       | 3 | 5 | 29    | 8 | 26  | VC.. 0501...                |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E04...-SVXCR05-AMS                | AS 0113              | KS 2505              |

## SWUC L/R



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

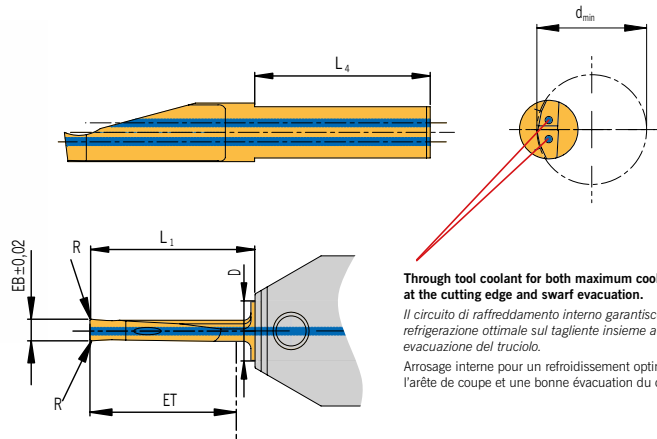
### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $d_{min}$ | F   | $L_1$ | D | AKL  | Insert<br>Inserto<br>Insert |
|------------------------------------|-----------|-----|-------|---|------|-----------------------------|
| E06-SWUCR02-AMS                    | 7,8       | 3,9 | 37,5  | 6 | 37,5 | WC.. 0201...                |

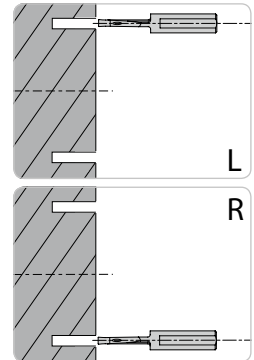
### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|-----------------------------------|----------------------|----------------------|
| E06...-SWUCR02-AMS                | T2.03                | KS 1886              |

**Axial grooving / Scanalatura assiale / Gorge axiale**



Through tool coolant for both maximum coolant direct at the cutting edge and swarf evacuation.  
Il circuito di raffreddamento interno garantisce una refrigerazione ottimale sul tagliente insieme ad una buona evacuazione del truciolo.  
Arrosage interne pour un refroidissement optimal sur l'arête de coupe et une bonne évacuation du copeau.



Left-hand execution shown  
Versione sinistra in figura  
Version représentée à gauche

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | EB  | ET | R   | L <sub>1</sub> | L <sub>4</sub> | HC   | HU   |
|--|------------------|-----|----|-----|----------------|----------------|------|------|
|  |                  |     |    |     |                |                | AL40 | AK40 |
| SAV151006-IK- L/R                      | 10               | 1,5 | 10 | 0,1 | 13             | 16             | ◆    | ◆    |
| SAV151506-IK- L/R                      | 10               | 1,5 | 15 | 0,1 | 18             | 16             | ◆    | ◆    |
| SAV201206-IK- L/R                      | 12               | 2,0 | 12 | 0,2 | 16             | 16             | ◆    | ◆    |
| SAV202006-IK- L/R                      | 12               | 2,0 | 20 | 0,2 | 23             | 16             | ◆    | ◆    |
| SAV252008-IK- L/R                      | 15               | 2,5 | 20 | 0,2 | 22             | 24             | ◆    | ◆    |
| SAV302008-IK- L/R                      | 15               | 3,0 | 20 | 0,2 | 22             | 24             | ◆    | ◆    |
| SAV303008-IK- L/R                      | 15               | 3,0 | 30 | 0,2 | 34             | 24             | ◆    | ◆    |
| SAV403010-IK- L/R                      | 30               | 4,0 | 30 | 0,2 | 34             | 24             | ◆    | ◆    |
| SAV404010-IK- L/R                      | 30               | 4,0 | 40 | 0,2 | 44             | 24             | ◆    | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

When face grooving into solid the overall groove depth can only be obtained in diameter range up to 50mm.

Con la scanalatura assiale dal pieno la profondità completa di scanalatura si ottiene solamente per una gamma di diametri fino a 50mm.

Lors de l'usinage de gorges axiales en pleine matière, la profondeur d'usinage n'est possible que jusqu'au diamètre de 50mm

L<sub>4</sub> = Clamping flat

L<sub>4</sub> = Piano bloccaggio

L<sub>4</sub> = surface de serrage

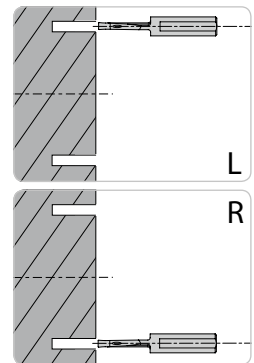
|   |   |   |
|---|---|---|
| P | ● | ● |
| M | ● | ● |
| K | ● | ● |
| N | ● | ● |
| S | ● | ● |
| H | ● | ● |

● Main application  
Applicazione principale  
Application principale

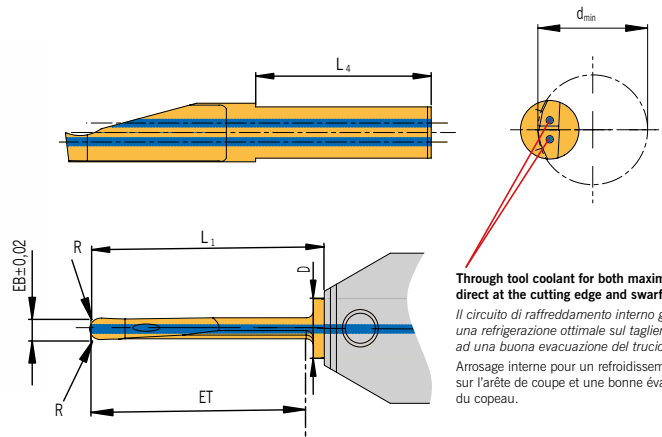
○ Secondary application  
Applicazione secondaria  
Application secondaire



**Axial grooving – Full radius execution / Scanalatura assiale – Esecuzione a raggio completo / Gorge axiale – version à rayon complet**



Left-hand execution shown  
Versione sinistra in figura  
Version représentée à gauche



Through tool coolant for both maximum coolant direct at the cutting edge and swarf evacuation.  
Il circuito di raffreddamento interno garantisce una refrigerazione ottimale sul tagliente insieme ad una buona evacuazione del truciolo.  
Arrosage interne pour un refroidissement optimal sur l'arête de coupe et une bonne évacuation du copeau.

| Designation<br>Articolo<br>Désignation | d <sub>min</sub> | EB | ET | R   | L <sub>1</sub> | L <sub>4</sub> | HC   | HU   |
|--|------------------|----|----|-----|----------------|----------------|------|------|
|  |                  |    |    |     |                |                | AL40 | AK40 |
| SAV202006-V-IK- L/R                    | 12               | 2  | 20 | 1,0 | 23             | 16             | ◆    | ◆    |
| SAV303008-V-IK- L/R                    | 15               | 3  | 30 | 1,5 | 34             | 24             | ◆    | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

When face grooving into solid the overall groove depth can only be obtained in diameter range up to 50mm.

Con la scanalatura assiale dal pieno la profondità completa di scanalatura si ottiene solamente per una gamma di diametri fino a 50mm.

Lors de l'usinage de gorges axiales en pleine matière, la profondeur d'usinage n'est possible que jusqu'au diamètre de 50mm

V = Full radius execution

V = Esecuzione a raggio completo

V = version à rayon complet

L<sub>4</sub> = Clamping flat

L<sub>4</sub> = Piano bloccaggio

L<sub>4</sub> = surface de serrage

|   |   |   |
|---|---|---|
| P | ● | ● |
| M | ● |   |
| K | ● | ● |
| N |   | ● |
| S | ● |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

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## Do you require a special design?

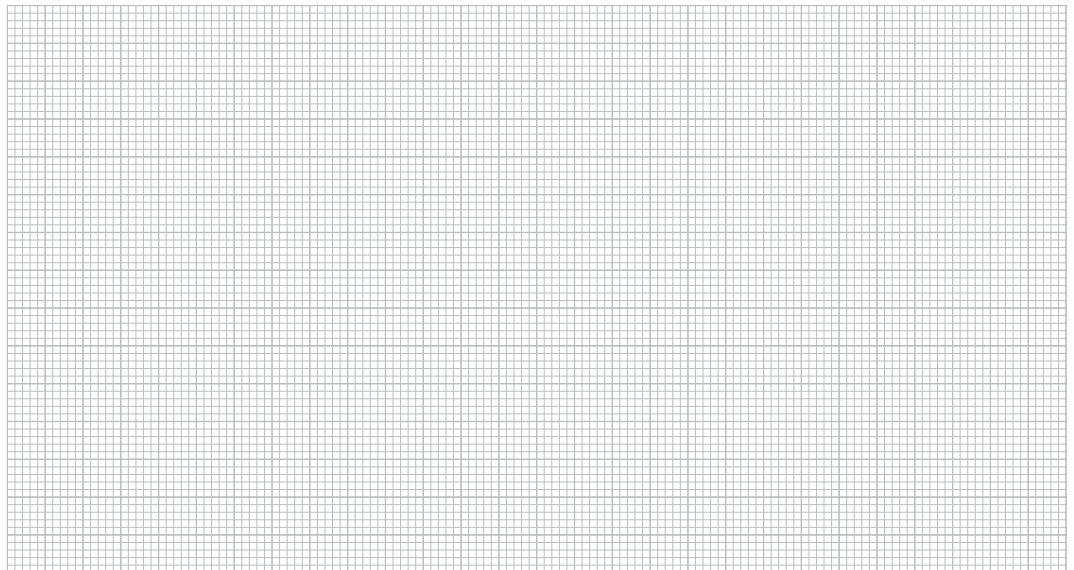
If special tasks require custom solutions, then ARNO is the right partner. As a manufacturer, we can produce AMS inserts to your specifications. Quickly and reliably. Simply name the standard insert and the dimensions you want to change:

Standard insert AMS- \_\_\_\_\_

Please change these dimensions: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Drawing:



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Address: Company: \_\_\_\_\_

Address: \_\_\_\_\_

Contact partner: \_\_\_\_\_

E-mail: \_\_\_\_\_

Tel: \_\_\_\_\_

**This form is available for download at [www.arno.de/download](http://www.arno.de/download). You can also send an e-mail with your specifications to [anfrage@arno.de](mailto:anfrage@arno.de).**





## Ha bisogno di un utensile in versione speciale?

Se particolari compiti richiedono soluzioni individuali, con noi ha trovato il partner giusto. Come produttori siamo in grado di realizzare rapidamente e in maniera affidabile inserti AMS in base alle sue indicazioni. È sufficiente che Lei ci indichi l'inserto standard e le dimensioni che desidera far modificare:

Inserto AMS standard \_\_\_\_\_

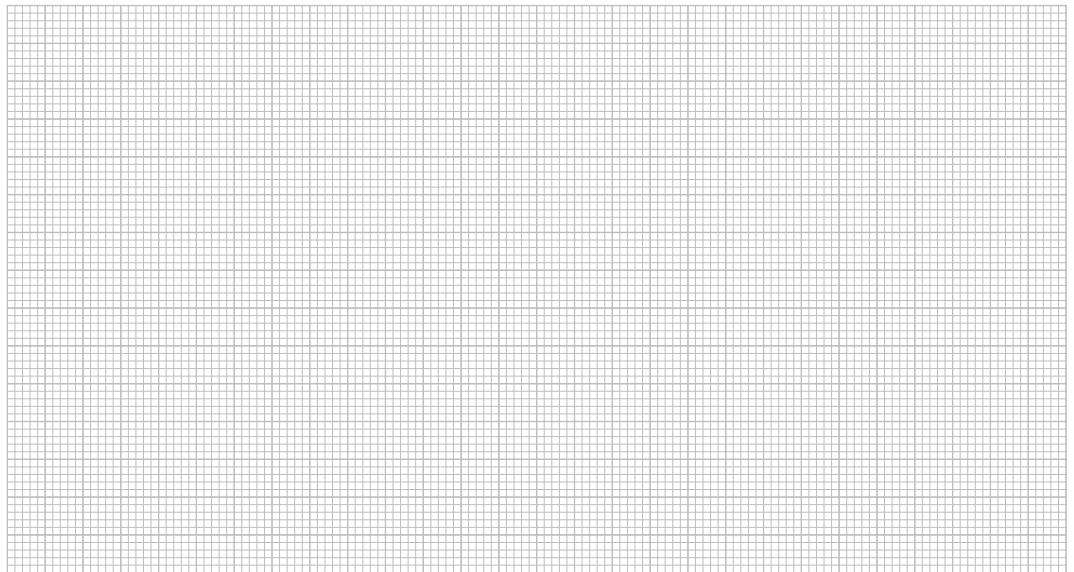
Modificare questa dimensione: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Schizzo:



6

Indirizzo: Società: \_\_\_\_\_

Indirizzo: \_\_\_\_\_

Referente: \_\_\_\_\_

e-mail: \_\_\_\_\_

Telefono: \_\_\_\_\_

**Su [www.arno.de/download](http://www.arno.de/download) troverà questo modulo da scaricare. Può anche inviarci una e-mail con i dati corrispondenti, all'indirizzo [anfrage@arno.de](mailto:anfrage@arno.de)**



## Vous avez besoin d'un modèle spécial ?

Si des tâches particulières exigent des solutions personnalisées, vous avez frappé à la bonne porte. En tant que fabricant, nous pouvons produire rapidement et de manière fiable des inserts de coupe AMS selon vos instructions. Pour cela, renseignez simplement l'insert de coupe standard et les dimensions que vous souhaiteriez modifier :

Insert de cou-pe standard AMS- \_\_\_\_\_

Modifier ces dimensions : \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Dessin :



Adresse :                      Entreprise : \_\_\_\_\_

Adresse : \_\_\_\_\_

Interlocuteur : \_\_\_\_\_

e-mail : \_\_\_\_\_

Téléphone : \_\_\_\_\_

**Ce modèle peut aussi être téléchargé sur [www.arno.de/download](http://www.arno.de/download). Vous pouvez volontiers envoyer un e-mail avec vos indications à [anfrage@arno.de](mailto:anfrage@arno.de).**

| Material group     | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                |                 |    |
|--------------------|---|---|---------------------|--|----------------|--------------------------|----------------|-----------------|----|
|                    |   |   |                     |  |                | HC                       |                | HU              | BU |
|                    |   |   |                     |  |                | AL40                     | AP5015         | AK40            |    |
| P                  | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 80 - 90 - 100            | 20 - 100 - 180 | -               |    |
|                    |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 80 - 90 - 100            | 20 - 100 - 180 | -               |    |
|                    |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 80 - 90 - 100            | 20 - 100 - 180 | -               |    |
|                    |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 80 - 90 - 100            | 20 - 100 - 180 | -               |    |
|                    |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 70 - 80 - 90             | 20 - 100 - 180 | -               |    |
|                    | Low alloyed steel   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | 80 - 90 - 100            | 20 - 100 - 180 | -               |    |
|                    |   | annealed  | 175                 | 591                                      | P7             | 80 - 90 - 100            | 15 - 90 - 160  | -               |    |
|                    |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 70 - 80 - 90             | 15 - 90 - 160  | -               |    |
|                    |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 50 - 60 - 70             | 15 - 90 - 160  | -               |    |
|                    |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 50 - 60 - 70             | 15 - 90 - 160  | -               |    |
|                    | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 80 - 90 - 100            | 20 - 70 - 120  | -               |    |
|                    |   | hardened  | 300                 | 1013                                     | P12            | 50 - 60 - 70             | 20 - 70 - 120  | -               |    |
|                    |   | hardened  | 400                 | 1361                                     | P13            | 50 - 60 - 70             | 20 - 70 - 120  | -               |    |
|                    | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | 40 - 65 - 90             | 20 - 55 - 90   | -               |    |
|                    |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | 40 - 65 - 90             | 20 - 100 - 180 | -               |    |
| M                  | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | 40 - 65 - 90             | 20 - 55 - 90   | -               |    |
|                    |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | 40 - 65 - 90             | 15 - 50 - 80   | -               |    |
|                    |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | 40 - 65 - 90             | 10 - 35 - 60   | -               |    |
| K                  | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | 50 - 60 - 70             | 20 - 70 - 120  | 40 - 50 - 60    |    |
|                    |   | pearlitic                                       | 260                 | 867                                      | K2             | 50 - 60 - 70             | 20 - 70 - 120  | 40 - 50 - 60    |    |
| K                  | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | 50 - 60 - 70             | 20 - 80 - 140  | 40 - 50 - 60    |    |
|                    |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 50 - 60 - 70             | 20 - 80 - 140  | 40 - 50 - 60    |    |
|                    |   | ferritic  | 155                 | 518                                      | K5             | 50 - 60 - 70             | 20 - 75 - 130  | 40 - 50 - 60    |    |
| K                  | Cast iron with nodular graphite                             | ferritic  | 265                 | 885                                      | K6             | 50 - 60 - 70             | 20 - 75 - 130  | 40 - 50 - 60    |    |
|                    |   | pearlitic                                       | 200                 | 675                                      | K7             | 50 - 60 - 70             | 20 - 70 - 120  | 40 - 50 - 60    |    |
| N                  | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | -                        | 20 - 260 - 500 | 100 - 125 - 150 |    |
|                    |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | -                        | 20 - 260 - 500 | 100 - 125 - 150 |    |
|                    | Casted aluminium alloys                                     | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | -                        | 20 - 260 - 500 | 100 - 125 - 150 |    |
|                    |   | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | -                        | 20 - 260 - 500 | 100 - 125 - 150 |    |
|                    | Magnesium alloys  | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | -                        | 20 - 260 - 500 | 100 - 125 - 150 |    |
|                    |   | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -              | -               |    |
|                    | Copper and copper alloys (Brass / Bronze)                   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | 120 - 150 - 180          | 20 - 310 - 600 | 100 - 125 - 150 |    |
|                    |   | Brass, Bronze                                   | 90                  | 314                                      | N8             | 120 - 150 - 180          | 20 - 310 - 600 | 100 - 125 - 150 |    |
|                    |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | 120 - 150 - 180          | 20 - 310 - 600 | 100 - 125 - 150 |    |
|                    | Non-ferrous materials                                       |   | 300                 | 1013                                     | N10            | -                        | -              | -               |    |
|                    |   | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -              | -               |    |
|                    |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -              | -               |    |
|                    |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -              | -               |    |
|                    |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -              | -               |    |
|                    |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -              | -               |    |
| S                  | High temperature resistant alloys                           | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -              | -               |    |
|                    |   | Fe-based annealed                               | 200                 | 675                                      | S1             | 40 - 65 - 90             | 15 - 45 - 75   | -               |    |
|                    |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | 40 - 65 - 90             | 15 - 45 - 75   | -               |    |
|                    |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | 40 - 65 - 90             | 15 - 30 - 40   | -               |    |
|                    |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | 40 - 65 - 90             | 15 - 30 - 40   | -               |    |
|                    | Titanium alloys   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | 40 - 65 - 90             | 15 - 30 - 40   | -               |    |
|                    |   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -              | -               |    |
|                    |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -              | -               |    |
|                    |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -              | -               |    |
|                    |   | Wolfram alloys                                  | 300                 | 1013                                     | S9             | -                        | -              | -               |    |
| Molybdän alloys    | 300   | 1013  | S10                 | -  | -              | -                        |                |                 |    |
| H                  | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -              | -               |    |
|                    |   | hardened  | 55 HRC              | -  | H2             | -                        | -              | -               |    |
|                    |   | hardened  | 60 HRC              | -  | H3             | -                        | -              | -               |    |
| Hardened cast iron | hardened  | 55 HRC  | -                   | H4                                       | -              | -                        | -              |                 |    |

The recommended cutting data are only approximate values.  
 It may be necessary to adjust them to each individual machining application.  
 HC = Solid carbide coated  
 HU = Solid carbide uncoated  
 BU = CBN super hard cutting materials uncoated

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| Gruppo materiale     | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                |                 |    |
|----------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|----------------|-----------------|----|
|                      |  |   |                 |                                    |                  | HC                            |                | HU              | BU |
|                      |  |   |                 |                                    |                  | AL40                          | AP5015         | AK40            |    |
| P                    | Acciai non legato  | C ≤ 0,25 % ricotto  | 125             | 428                                | P1               | 80 - 90 - 100                 | 20 - 100 - 180 | -               | -  |
|                      |  | C >= 0,25 ... >= 0,55 % ricotto                           | 190             | 639                                | P2               | 80 - 90 - 100                 | 20 - 100 - 180 | -               | -  |
|                      |  | C >= 0,25 ... >= 0,55 % bonificato                        | 210             | 708                                | P3               | 80 - 90 - 100                 | 20 - 100 - 180 | -               | -  |
|                      |  | C ≤ 0,55 % ricotto  | 190             | 639                                | P4               | 80 - 90 - 100                 | 20 - 100 - 180 | -               | -  |
|                      |  | C ≤ 0,55 % bonificato                                     | 300             | 1013                               | P5               | 70 - 80 - 90                  | 20 - 100 - 180 | -               | -  |
|                      | Acciai debolmente legati                                   | Acciaio (truciolo corto) ricotto                          | 220             | 745                                | P6               | 80 - 90 - 100                 | 20 - 100 - 180 | -               | -  |
|                      |  | ricotto   | 175             | 591                                | P7               | 80 - 90 - 100                 | 15 - 90 - 160  | -               | -  |
|                      |  | bonificato  | 300             | 1013                               | P8               | 70 - 80 - 90                  | 15 - 90 - 160  | -               | -  |
|                      |  | bonificato  | 380             | 1282                               | P9               | 50 - 60 - 70                  | 15 - 90 - 160  | -               | -  |
|                      |  | bonificato  | 430             | 1477                               | P10              | 50 - 60 - 70                  | 15 - 90 - 160  | -               | -  |
|                      | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | 80 - 90 - 100                 | 20 - 70 - 120  | -               | -  |
| temprato e rinvenuto |  | 300   | 1013            | P12                                | 50 - 60 - 70     | 20 - 70 - 120                 | -              | -               |    |
| temprato e rinvenuto |  | 400   | 1361            | P13                                | 50 - 60 - 70     | 20 - 70 - 120                 | -              | -               |    |
| Acciai inossidabili  | ferritico / martensitico, ricotto                          | 200   | 675             | P14                                | 40 - 65 - 90     | 20 - 55 - 90                  | -              | -               |    |
|                      | martensitico, bonificato                                   | 330   | 1114            | P15                                | 40 - 65 - 90     | 20 - 100 - 180                | -              | -               |    |
| M                    | Acciai inossidabili  | austenitico, trattato o temperato                         | 200             | 675                                | M1               | 40 - 65 - 90                  | 20 - 55 - 90   | -               | -  |
|                      |  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | 40 - 65 - 90                  | 15 - 50 - 80   | -               | -  |
|                      |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | 40 - 65 - 90                  | 10 - 35 - 60   | -               | -  |
| K                    | Ghisa temprata   | ferritico   | 200             | 675                                | K1               | 50 - 60 - 70                  | 20 - 70 - 120  | 40 - 50 - 60    | -  |
|                      |  | perlitica   | 260             | 867                                | K2               | 50 - 60 - 70                  | 20 - 70 - 120  | 40 - 50 - 60    | -  |
|                      | Ghisa grigia   | bassa resistenza  | 180             | 602                                | K3               | 50 - 60 - 70                  | 20 - 80 - 140  | 40 - 50 - 60    | -  |
|                      |  | alta resistenza / austenitico                             | 245             | 825                                | K4               | 50 - 60 - 70                  | 20 - 80 - 140  | 40 - 50 - 60    | -  |
|                      | Ghisa sferoidale   | ferritico   | 155             | 518                                | K5               | 50 - 60 - 70                  | 20 - 75 - 130  | 40 - 50 - 60    | -  |
| GGV (CGI)            | perlitica  | 265   | 885             | K6                                 | 50 - 60 - 70     | 20 - 75 - 130                 | 40 - 50 - 60   | -               |    |
| N                    | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | -                             | 20 - 260 - 500 | 100 - 125 - 150 | -  |
|                      |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | -                             | 20 - 260 - 500 | 100 - 125 - 150 | -  |
|                      | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | -                             | 20 - 260 - 500 | 100 - 125 - 150 | -  |
|                      |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | -                             | 20 - 260 - 500 | 100 - 125 - 150 | -  |
|                      |  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | -                             | 20 - 260 - 500 | 100 - 125 - 150 | -  |
|                      | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -              | -               | -  |
|                      | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | 120 - 150 - 180               | 20 - 310 - 600 | 100 - 125 - 150 | -  |
|                      |  | Ottone, Bronzo  | 90              | 314                                | N8               | 120 - 150 - 180               | 20 - 310 - 600 | 100 - 125 - 150 | -  |
|                      |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | 120 - 150 - 180               | 20 - 310 - 600 | 100 - 125 - 150 | -  |
|                      |  |   | 300             | 1013                               | N10              | -                             | -              | -               | -  |
|                      | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | -              | -               | -  |
|                      |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | -              | -               | -  |
|                      |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | -              | -               | -  |
|                      |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | -              | -               | -  |
|                      |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | -              | -               | -  |
|                      |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -              | -               | -  |
| S                    | Leghe resistenti al calore                                 | Base-Fe ricotto   | 200             | 675                                | S1               | 40 - 65 - 90                  | 15 - 45 - 75   | -               | -  |
|                      |  | Base-Fe invecchiato                                       | 280             | 943                                | S2               | 40 - 65 - 90                  | 15 - 45 - 75   | -               | -  |
|                      |  | Base Ni o Co ricotto                                      | 250             | 839                                | S3               | 40 - 65 - 90                  | 15 - 30 - 40   | -               | -  |
|                      |  | Base Ni o Co invecchiato                                  | 350             | 1177                               | S4               | 40 - 65 - 90                  | 15 - 30 - 40   | -               | -  |
|                      |  | Base Ni o Co da fusione                                   | 320             | 1076                               | S5               | 40 - 65 - 90                  | 15 - 30 - 40   | -               | -  |
|                      | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | -                             | -              | -               | -  |
|                      |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | -                             | -              | -               | -  |
|                      |  | Leghe β   | 410             | 1396                               | S8               | -                             | -              | -               | -  |
|                      | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -              | -               | -  |
|                      | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -              | -               | -  |
| H                    | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | -                             | -              | -               | -  |
|                      |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | -                             | -              | -               | -  |
|                      |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -              | -               | -  |
|                      | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -              | -               | -  |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

BU = materiali da taglio extra duri CBN non rivestiti



| Groupe de matériaux                   | Structure des groupes de matériaux et des lettres de référence | Dureté Brinell                                      | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                 |                |                 |  |
|---------------------------------------|--|---|------------------------------------|-------------------|-----------------------------|-----------------|----------------|-----------------|--|
|                                       |  |   |                                    |                   | HC                          |                 | HU             | BU              |  |
|                                       |  |   |                                    |                   | AL40                        | AP5015          | AK40           |                 |  |
| P                                     | Acier non allié  | C ≤ 0,25 % recuit                                   | 125                                | 428               | P1                          | 80 - 90 - 100   | 20 - 100 - 180 | -               |  |
|                                       |  | C >= 0,25 ... >= 0,55 % recuit                      | 190                                | 639               | P2                          | 80 - 90 - 100   | 20 - 100 - 180 | -               |  |
|                                       |  | C >= 0,25 ... >= 0,55 % traité                      | 210                                | 708               | P3                          | 80 - 90 - 100   | 20 - 100 - 180 | -               |  |
|                                       |  | C ≤ 0,55 % recuit                                   | 190                                | 639               | P4                          | 80 - 90 - 100   | 20 - 100 - 180 | -               |  |
|                                       |  | C ≤ 0,55 % traité                                   | 300                                | 1013              | P5                          | 70 - 80 - 90    | 20 - 100 - 180 | -               |  |
|                                       | Acier faiblement allié   | Aciers de décolletage (à copeaux courts) recuit     | 220                                | 745               | P6                          | 80 - 90 - 100   | 20 - 100 - 180 | -               |  |
|                                       |  | recuit  | 175                                | 591               | P7                          | 80 - 90 - 100   | 15 - 90 - 160  | -               |  |
|                                       |  | traité  | 300                                | 1013              | P8                          | 70 - 80 - 90    | 15 - 90 - 160  | -               |  |
|                                       |  | traité  | 380                                | 1282              | P9                          | 50 - 60 - 70    | 15 - 90 - 160  | -               |  |
|                                       |  | traité  | 430                                | 1477              | P10                         | 50 - 60 - 70    | 15 - 90 - 160  | -               |  |
|                                       | Acier allié et acier outil allié                               | recuit  | 200                                | 675               | P11                         | 80 - 90 - 100   | 20 - 70 - 120  | -               |  |
|                                       |  | trempe et revenu                                    | 300                                | 1013              | P12                         | 50 - 60 - 70    | 20 - 70 - 120  | -               |  |
|                                       |  | trempe et revenu                                    | 400                                | 1361              | P13                         | 50 - 60 - 70    | 20 - 70 - 120  | -               |  |
|                                       | Acier inox   | ferritique, martensitique, recuit                   | 200                                | 675               | P14                         | 40 - 65 - 90    | 20 - 55 - 90   | -               |  |
|                                       |  | martensitique, traité                               | 330                                | 1114              | P15                         | 40 - 65 - 90    | 20 - 100 - 180 | -               |  |
| M                                     | Acier inox   | austénitique  | 200                                | 675               | M1                          | 40 - 65 - 90    | 20 - 55 - 90   | -               |  |
|                                       |  | austénitique  | 300                                | 1013              | M2                          | 40 - 65 - 90    | 15 - 50 - 80   | -               |  |
|                                       |  | austénitique-ferritique, Duplex                     | 230                                | 778               | M3                          | 40 - 65 - 90    | 10 - 35 - 60   | -               |  |
| K                                     | Fonte malléable  | ferritique  | 200                                | 675               | K1                          | 50 - 60 - 70    | 20 - 70 - 120  | 40 - 50 - 60    |  |
|                                       |  | perlitique  | 260                                | 867               | K2                          | 50 - 60 - 70    | 20 - 70 - 120  | 40 - 50 - 60    |  |
|                                       | Fonte grise  | faible résistance                                   | 180                                | 602               | K3                          | 50 - 60 - 70    | 20 - 80 - 140  | 40 - 50 - 60    |  |
|                                       |  | haute résistance / austénitique                     | 245                                | 825               | K4                          | 50 - 60 - 70    | 20 - 80 - 140  | 40 - 50 - 60    |  |
|                                       | Fonte à Graphite sphéroïdale                                   | ferritique  | 155                                | 518               | K5                          | 50 - 60 - 70    | 20 - 75 - 130  | 40 - 50 - 60    |  |
|                                       |  | perlitique  | 265                                | 885               | K6                          | 50 - 60 - 70    | 20 - 75 - 130  | 40 - 50 - 60    |  |
|                                       | GGV (CGI)  |   | 200                                | 675               | K7                          | 50 - 60 - 70    | 20 - 70 - 120  | 40 - 50 - 60    |  |
| N                                     | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement                | 30                                 | -                 | N1                          | -               | 20 - 260 - 500 | 100 - 125 - 150 |  |
|                                       |  | pouvant subir un durcissement, durci                | 100                                | 343               | N2                          | -               | 20 - 260 - 500 | 100 - 125 - 150 |  |
|                                       | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement     | 75                                 | 260               | N3                          | -               | 20 - 260 - 500 | 100 - 125 - 150 |  |
|                                       |  | ≤ 12 % Si, pouvant subir un durcissement, durci     | 90                                 | 314               | N4                          | -               | 20 - 260 - 500 | 100 - 125 - 150 |  |
|                                       |  | > 12 % Si, ne pouvant pas subir de durcissement     | 130                                | 447               | N5                          | -               | 20 - 260 - 500 | 100 - 125 - 150 |  |
|                                       | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement     | 70                                 | 250               | N6                          | -               | -              | -               |  |
|                                       |  | non allié, cuivre électrolytique                    | 100                                | 343               | N7                          | 120 - 150 - 180 | 20 - 310 - 600 | 100 - 125 - 150 |  |
|                                       | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                         | 90                                 | 314               | N8                          | 120 - 150 - 180 | 20 - 310 - 600 | 100 - 125 - 150 |  |
|                                       |  | Alliage de cuivre à copeaux courts                  | 110                                | 382               | N9                          | 120 - 150 - 180 | 20 - 310 - 600 | 100 - 125 - 150 |  |
|                                       |  | forte résistance, Ampco                             | 300                                | 1013              | N10                         | -               | -              | -               |  |
|                                       |  |   |                                    |                   |                             |                 |                |                 |  |
|                                       | Matériaux non métalliques                                      | Thermoplaste (sans agents de charge abrasives)      | -                                  | -                 | N11                         | -               | -              | -               |  |
|                                       |  | Duroplaste (sans agents de charge abrasives)        | -                                  | -                 | N12                         | -               | -              | -               |  |
|                                       |  | Matière plastique renforcée de fibres de verre GFRP | -                                  | -                 | N13                         | -               | -              | -               |  |
|                                       |  | Matière plastique renforcé composite CFRP           | -                                  | -                 | N14                         | -               | -              | -               |  |
| Plastique renforcé fibre aramide AFRP |  | -   | -                                  | N15               | -                           | -               | -              |                 |  |
| Graphite                              |  | 80 Shore  | -                                  | N16               | -                           | -               | -              |                 |  |
| S                                     | Alliages réfractaires  | à base de Fe recuit                                 | 200                                | 675               | S1                          | 40 - 65 - 90    | 15 - 45 - 75   | -               |  |
|                                       |  | à base de Fe durci                                  | 280                                | 943               | S2                          | 40 - 65 - 90    | 15 - 45 - 75   | -               |  |
|                                       |  | à base Ni ou Co recuit                              | 250                                | 839               | S3                          | 40 - 65 - 90    | 15 - 30 - 40   | -               |  |
|                                       |  | à base Ni ou Co durci                               | 350                                | 1177              | S4                          | 40 - 65 - 90    | 15 - 30 - 40   | -               |  |
|                                       |  | à base Ni ou Co jeter                               | 320                                | 1076              | S5                          | 40 - 65 - 90    | 15 - 30 - 40   | -               |  |
|                                       | Alliage de titane  | Titane pur  | 200                                | 675               | S6                          | -               | -              | -               |  |
|                                       |  | Alliages Alpha + Beta, trempé                       | 375                                | 1262              | S7                          | -               | -              | -               |  |
|                                       |  | Alliages Beta                                       | 410                                | 1396              | S8                          | -               | -              | -               |  |
|                                       | Alliage de tungstène   |   | 300                                | 1013              | S9                          | -               | -              | -               |  |
|                                       | Alliage de molybdène   |   | 300                                | 1013              | S10                         | -               | -              | -               |  |
| H                                     | Acier trempé   | trempe et revenu                                    | 50 HRC                             | -                 | H1                          | -               | -              | -               |  |
|                                       |  | trempe et revenu                                    | 55 HRC                             | -                 | H2                          | -               | -              | -               |  |
|                                       |  | trempe et revenu                                    | 60 HRC                             | -                 | H3                          | -               | -              | -               |  |
|                                       | Fonte durci  | trempe et revenu                                    | 55 HRC                             | -                 | H4                          | -               | -              | -               |  |

Les données affichées dans le tableau sont des valeurs approximatives.  
 Il peut être nécessaire de les adapter à des applications d'usinage individuelles.  
 HC = Carbure avec revêtement  
 HU = Carbure sans revêtement  
 BU = matériaux de coupe ultra-durs CBN sans revêtement





# STANDARD CUTTING DATA

## VALORI INDICATIVI DATI RELATIVI AL TAGLIO

## VALEURS DE COUPE RECOMMANDÉES

### AH7525

| Diameter / Diametro / Diamètre | Vc [m/min] | f [mm/r]  | ap [mm]   |
|--------------------------------|------------|-----------|-----------|
| 2.0 mm – 3.0 mm                | 50–150     | 0.01–0.03 | 0.01–0.05 |
| 3.5 mm – 4.5 mm                | 50–150     | 0.01–0.05 | 0.01–0.10 |
| 5.0 mm – 6.0 mm                | 50–150     | 0.01–0.08 | 0.01–0.10 |

### Standard cutting data for thread turning – number of passes

Valori indicativi dati relativi al taglio Filettatura – Numero delle passate

Valeurs de coupe recommandées filetage – nombre de passages

| Pitch / Passo / Hélice |  | Number of cuts / Numero dei tagli / Nombre de coupes   |           |         |   |                                   |                                     |
|------------------------|--|--|-----------|---------|---|-----------------------------------|-------------------------------------|
| Vc [m/min]             |  | 110–140  | 80–110    | 65–80   | 70–90   | 80–110                            | 200–250                             |
| [mm]                   | Pass/inch<br>Filettatura/pollice<br>Filets/pouce | Steel toughness [N/mm <sup>2</sup> ]<br>Resistenza acciaio [N/mm <sup>2</sup> ]<br>Résistance acier [N/mm <sup>2</sup> ] |           |         | Stainless<br>Inossidabile<br>Acier inoxydable | Cast metal<br>Pezzi fusi<br>Fonte | Aluminium<br>Alluminio<br>Aluminium |
|                        |  | 400–700  | 700–1,000 | > 1,000 |   |                                   |                                     |
| 0.5                    | 48   | 6  | 7         | 7       | 8   | 7                                 | 6                                   |
| 0.75                   | 32   | 8  | 9         | 9       | 10  | 9                                 | 8                                   |
| 0.8                    | 32   | 8  | 9         | 10      | 10  | 9                                 | 8                                   |
| 1                      | 24   | 10   | 11        | 12      | 12  | 12                                | 10                                  |
| 1.25                   | 20–19  | 12   | 14        | 15      | 15  | 14                                | 12                                  |
| 1.5                    | 16   | 15   | 17        | 18      | 18  | 17                                | 15                                  |
| 1.75                   | 14   | 17   | 19        | 21      | 21  | 18                                | 17                                  |
| 2                      | 12   | 19   | 22        | 25      | 25  | 20                                | 18                                  |
| 2.5                    | 10   | 22   | 26        | 31      | 31  | 22                                | 20                                  |
| 3.0–3.5                | 8  | 28   | 32        | 38      | 38  | 24                                | 22                                  |

The values listed here are general recommendations for the number of passes for machining normal steel and non-ferrous metal materials. With hard materials, the cutting depth should be reduced and the number of cuts increased. If the insert ruptures, increase the number of passes. If the insert is subject to high wear, reduce the number of passes.

**NOTE:** The chip cross-section should be of identical size for each pass. This means that, as cutting depth increases, reduce the infeed to maintain constant cutting forces.

*I valori qui indicati sono raccomandazioni generali per il numero delle passate durante la lavorazione di normali materiali in acciaio o metalli non ferrosi. Per i materiali duri si deve ridurre la profondità di taglio e aumentare il numero dei tagli. In caso di rottura dell'inserto il numero dei passaggi va aumentato, in presenza di usura elevata va ridotto.*

*NOTA: La sezione dei trucioli dovrebbe avere la stessa dimensione ad ogni passata, ciò significa che con l'aumentare della profondità del taglio si deve ridurre l'avanzamento per ottenere forze di taglio costanti.*

Les valeurs indiquées ici sont des recommandations générales pour le nombre de passages pour l'usinage de matériaux en acier et non ferreux normaux. Pour les matériaux durs, il convient de réduire la profondeur de coupe et d'augmenter le nombre de coupes. En cas de rupture de plaquette, le nombre de passages doit être augmenté. Il doit être réduit en cas de forte usure.

**REMARQUE :** la section de copeaux doit être de la même taille à chaque passage, c'est-à-dire que la disposition doit être réduite à profondeur de coupe croissante afin d'obtenir des pressions de coupe constantes.

### SAV standard cutting data – Axial grooving

Valori indicativi dati relativi al taglio SAV – Scanalatura assiale

Valeurs de coupe recommandées SAV – usinage de gorges axial

| Material<br>Materiale<br>Matériau  | HB      | AL40      |            | AK40      |            |
|--|---------|-----------|------------|-----------|------------|
|  |         | f [mm/r]  | Vc [m/min] | f [mm/r]  | Vc [m/min] |
| <b>Alloyed steel, tool steel</b><br>Acciaio legato, acciaio da utensili<br>Acier allié, acier à outils   | 250     | 0.01–0.03 | 80–100     | 0.01–0.02 | 50–60      |
| <b>Alloyed steel, tool steel</b><br>Acciaio legato, acciaio da utensili<br>Acier allié, acier à outils   | 300     | 0.01–0.03 | 70–90      | 0.01–0.02 | 50–60      |
| <b>Alloyed steel, tool steel</b><br>Acciaio legato, acciaio da utensili<br>Acier allié, acier à outils   | 400     | 0.01–0.02 | 50–60      | 0.01–0.02 | 30–40      |
| <b>Heat-resistant alloys</b><br>Leghe resistenti al calore<br>Alliages réfractaires  | 150–200 | 0.01–0.02 | 50–80      | 0.01–0.02 | 40–60      |
| <b>Cast metal</b><br>Pezzi fusi<br>Fonte   | 200–250 | 0.01–0.03 | 50–70      | 0.01–0.02 | 40–60      |
| <b>Aluminium alloys</b><br>Leghe di alluminio<br>Alliages d'aluminium  | 100     | 0.02–0.05 | 120–180    | 0.02–0.05 | 100–150    |
| <b>Copper alloys, brass, non-ferrous metals</b><br>Leghe di rame, ottone e metalli non ferrosi<br>Alliages de cuivre, laiton, métaux non ferreux | 100     | 0.02–0.05 | 120–180    | 0.02–0.05 | 100–150    |

The values listed in the table are standard values. It may be necessary to adapt the value to particular machining conditions.

I valori riportati nelle tabelle sono indicativi. Può essere necessario adattare i valori alle singole applicazioni.

Les valeurs du tableau sont indicatives. Il peut être nécessaire de les adapter aux conditions d'usinage respectives.

## MATERIAL AND MACHINING APPLICATION

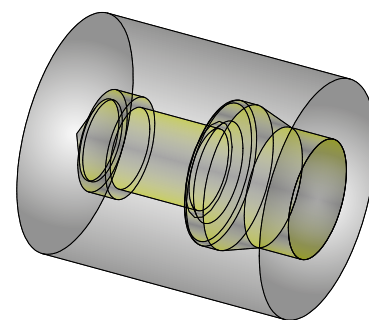
### MATERIALE E LAVORAZIONE

### MATÉRIAU ET USINAGE

| ISO      | Material<br>Materiale<br>Matériau   | Max. cutting depth $a_p$ [mm]<br>Max. profondità di passata $a_p$ [mm]<br>Temps d'accès Profondeur de passe $a_p$ [mm] | Machining<br>Lavorazione<br>Usinage   | Feed rate range<br>Zona di avanzamento<br>Plage d'avance |
|----------|---|--|---|--|
| <b>P</b> | <b>Steel</b><br>Acciaio<br>Acier  | 0.5  | <b>Grooving, parting off</b><br>Troncatura, realizzazione di gole<br>Usinage de gorges, tronçonnage   | 0.01–0.02  |
| <b>M</b> | <b>Stainless steel</b><br>Acciaio inossidabile<br>Acier inoxydable                                      | 0.3  | <b>Boring, turning and copying</b><br>Realizzazione di fori e copiatura<br>Alésage et copiage   | 0.02–0.05  |
| <b>K</b> | <b>Cast metal</b><br>Pezzi fusi<br>Fonte  | 0.3  | <b>Pre-grooving, chamfering, back turning</b><br>Prescanalatura, smussatura, lavorazione in tirata<br>Ébauche, chanfreinage et tournage arrière | 0.02–0.05  |
| <b>N</b> | <b>Non-ferrous metals, aluminium</b><br>Metalli non ferrosi, Alluminio<br>Métaux non ferreux, aluminium | 1.0  | <b>Face groove turning</b><br>Realizzazione di scanalature assiali<br>Tournage de gorges axiales  | 0.02–0.05  |

## APPLICATION EXAMPLE ESEMPIO DI UTILIZZO VALEURS DE COUPE RECOMMANDÉES

| Machining<br>Material 1.2343 at 800 N/mm <sup>2</sup><br><i>Lavorazione<br/>Materiale 1.2343 con 800 N/mm<sup>2</sup><br/>Usinage<br/>Matériau 1.2343 avec 800 N/mm<sup>2</sup></i> | Group<br>Gruppo<br>Groupe   | Recommended cutting data<br><i>Valori di taglio consigliati<br/>Valeurs de coupe recommandées</i> |   |
|---|-----------------------------|---|---|
|   |                             | Speed n (rpm)<br><i>Numero di giri n (giri/min)<br/>Vitesse de rotation n (tr/min)</i>            | Feed rate range f (mm/r)<br><i>Zona di avanzamento f<br/>[mm/giri]<br/>Plage d'avance f (mm/tr)</i> |
| <b>Pre-machining, drilling 10 mm diameter</b><br><i>Prelavorazione foratura Ø 10 mm<br/>Alésage de pré-usinage Ø 10 mm</i>  | SC10L-0023SP-05             | 3800  | 0.03  |
| <b>Bore roughing 6 mm diameter</b><br><i>Prelavorazione foratura Ø 6 mm<br/>Alésage de pré-usinage Ø 6 mm</i>   | SPC0060-0300 VHM /<br>TiAlN | 4200  | 0.1   |
| <b>Turning to core diameter M8</b><br><i>Tornitura, diametro di nocciolo M8<br/>Tournage, diamètre central M8</i>   | AMS-D-590802-200.60R        | 4200  | 0.04  |
| <b>Relief groove, thread</b><br><i>Sottosquadro, filettatura<br/>Usinage de gorges, filetage</i>  | AMS-S-59151800-200.60R      | 4200  | 0.02  |
| <b>Thread M8</b><br><i>Filettatura M8<br/>Filetage M8</i>   | AMS-G-M8-200.60R            | 1640  | 1.25  |
| <b>Turning, contour</b><br><i>Tornitura, profilo<br/>Tournage, contour</i>  | AMS-K-591802-200.60R        | 3800  | 0.02–0.04   |



## INSTALLING THE ARNO® MINI-SYSTEM MONTAGGIO ARNO®-MINI-SYSTEM MONTAGE MINI SYSTÈME ARNO®

**Fixed positioning pin**  
*Perno di arresto fisso  
Goujon de butée fixée*

**Guaranteed tip height by completely ground inserts**  
*Altezza delle punte garantita grazie a inserti completamente rettificati  
Hauteur de pointe garantie grâce à des inserts de coupe entièrement affûtés*

**Ground bevel on shank**  
*Inclinazione rettificata sul codolo  
Chanfrein affûté sur la tige*

**The ground taper on the tool shank combined with the fixed stop in the sleeve ensures the exact radial fixing of the insert at the correct tip height. The optimised insert clamping is ensured by clamping the threaded pin in the cone.**

*La spoglia rettificata sullo stelo combinata con il perno di arresto garantisce un esatto fissaggio radiale dell'inserto da taglio rispetto all'altezza delle punte. È possibile ottenere un ottimale bloccaggio dell'inserto mediante il bloccaggio della vite senza testa sulla superficie conica.*

Le chanfrein affûté sur la tige combiné à un goujon de butée garantit une fixation radiale exacte de l'insert de coupe en ce qui concerne la hauteur de pointe. Vous obtenez une tension optimale de l'insert de coupe en serrant la vis sans tête sur la surface conique.

## SIM – Boring bars

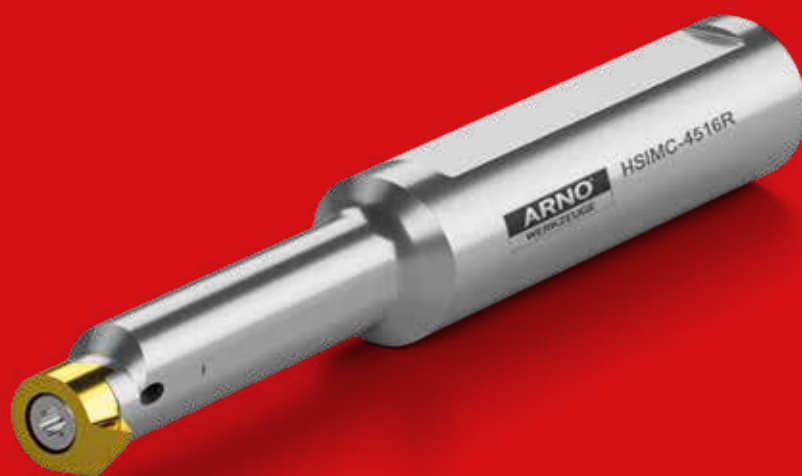
- System presentation
- Tool selection
- Designation System
- Boring bars
- Inserts
- Recommended cutting data
- Application notes

*Bareni SIM*

- *Presentazione del sistema*
- *Scelta di utensili*
- *Sistema di identificazione*
- *Bareni*
- *Inserti*
- *Valori di taglio consigliati*
- *Suggerimenti tecnici*

## SIM – barres d'alésage

- Présentation du système 552 – 553
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## System introduction

Caratteristiche del sistema

L'imagination du système

# UNRIVALLED RIGIDITY AND PRECISION. RIGIDITÀ SENZA CONCORRENZA STABILE E PRECISO. STABILITÉ ET PRÉCISION INÉGALÉES.

## Perfect for internal machining starting at 6.7 mm bore diameter: the modular ARNO SIM System.

Perfect repeatability and rigidity due to oval shaped shank and patented ARNO interface: The 3-point right angled location ensures optimised transfer of cutting forces. At the same time, you benefit from absolute repeatability of insert positioning. Inserts are easy and fast to change as there is only one screw.

*La scelta ottimale per la lavorazione interna di fori con diametro a partire da 6,7 mm: il sistema modulare ARNO SIM.*

*Perfetta precisione di ripetibilità e stabilità grazie alla struttura ovale e all'interfaccia brevettata ARNO: Il sistema di accoppiamento a 3 punti garantisce un ottimo trasferimento delle forze di taglio grazie alle superfici di appoggio perpendicolari.*

*Inoltre è assicurata una assoluta precisione di posizionamento dell'inserto.*

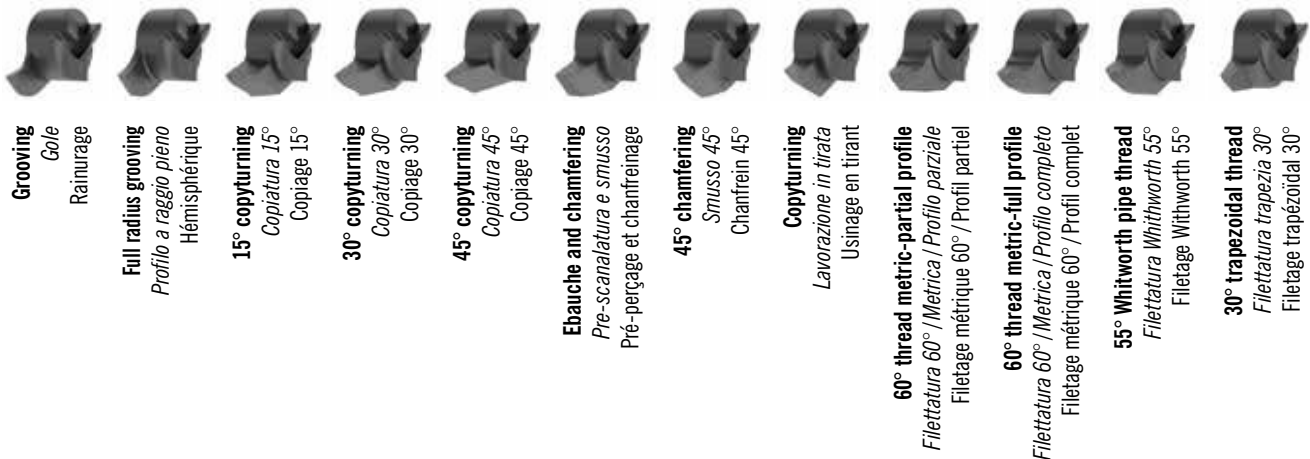
*Con una sola vite è possibile sostituire rapidamente e semplicemente gli inserti.*

Idéal pour l'usinage intérieur à partir d'un diamètre de forage de 6,7 mm : le système modulaire SIM d'ARNO.

Précision de répétition et stabilité optimales grâce à la construction de forme ovale et au point de jonction ARNO breveté : Le support à 3 points garantit la meilleure transmission des forces de coupe par les surfaces de contact rectangulaires.

Vous profitez en même temps d'une précision de répétition absolue lors du positionnement de la tête de coupe.

Les inserts de coupe se remplacent rapidement et simplement avec une seule vis.



## Inserts

- Cutting depths up to 6 mm, groove widths from 0.5 to 4 mm
- PVD coating optimised to each application
- Simple fast handling – only one screw to replace inserts

## Testine

- Profondità di taglio fino a 6 mm, larghezze di taglio da 0,5 a 4 mm
- Rivestimento in PVD ottimale per la relativa applicazione
- Sostituzione semplice e rapida delle testine, mediante una sola vite

## Têtes de coupe

- Profondeurs d'usinage jusqu'à 6 mm, largeurs d'usinage de 0,5 jusqu'à 4 mm
- Des revêtements PVD adaptés à chaque utilisation
- Manipulation simple et rapide : changement des têtes de coupe avec une vis seulement



### Boring bars

- Standard and square holders in 5 sizes starting at 6.7 mm bore diameter
- Rigid 3-point location, oval shaped shank and 2 location flats on the shank
- Long tool life thanks to through tool cooling
- Available in steel and carbide execution – the carbide shank with its brazed steel head is vibration damped
- Overhangs up to 80 mm

### Bareni

- Adattatore standard e a stelo quadro in 5 misure a partire da un diametro del foro di 6,7 mm
- Stabile grazie al sistema di accoppiamento a 3 punti, alla struttura ovale e alle 2 superfici di bloccaggio sul codolo
- Elevata durata grazie all'adduzione interna del refrigerante
- Disponibile nelle versioni in acciaio e in metallo duro integrale – il codolo in MD con testina in acciaio saldata antivibrazioni
- Lunghezze fino a 80 mm

### Corps d'outils

- Support standard et à section 12x20 en 5 dimensions à partir d'un diamètre de forage de 6,7 mm
- Stables grâce au support à 3 points, à la construction de forme ovale et 2 surfaces de serrage sur la tige
- Longue durée de vie grâce à l'arrivée interne de liquide de refroidissement
- Modèles en acier et en carbure monobloc disponibles : la tige HM avec tête brasé permet de limiter les vibrations.
- Sortie d'outil jusqu'à jusqu'à 80 mm

### Precision strength – 3-point location with 90° positioning

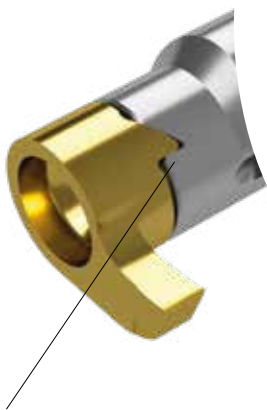
Optimised force transfer guaranteed by right angled positioning – as well as the repeatability of the positioning of the insert.

### Rigidità precisa – appoggio a 3 punti con superfici di appoggio a 90°

Un ottimale trasferimento delle forze garantito dall'angolo retto della superficie di appoggio – così come la precisione durante il posizionamento della testina.

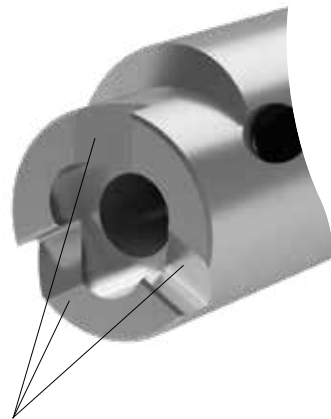
### Support 3 points avec surfaces de contact à 90°

La transmission optimale de la puissance est assurée par l'angle droit de la surface de contact.



#### Right angled positioning

Superfici di appoggio perpendicolari  
Surfaces de contact à angle droit



#### 3-point location

Appoggio a 3 punti  
Support 3 points

### Versatile

- Grooving
- Full radius grooving
- Circlip DIN 471/472
- Copying
- Pre-grooving
- Chamfering
- Copyturning
- Threading

### Versatile

- Gole
- Profili a raggio pieno
- Sedi Seeger DIN 471/472
- Copiatura
- Prescanalatura
- Smusso
- Lavorazione in tirata
- Filettatura

### Polyvalent

- Tronçonnage
- Tronçonnage de rayon
- Circlips DIN 471/472
- Copiage
- Ébauche
- Chanfreinage
- Tournage arrière
- Filetage

## OVERVIEW OF BORING BARS AND INSERTS

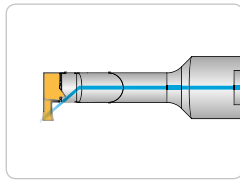
### PANORAMICA BARENI E INSERTI

### APERÇU DES BARRES D'ALÉSAGE ET DES INSERTS DE COUPE

#### Boring bars

*Bareni*

Barres d'alésage

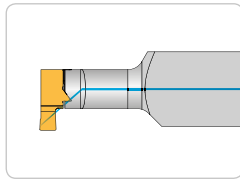


#### Boring bars – Standard

*Bareni – Standard*

Barres d'alésage

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#### Square holder

*Utensile quadro*

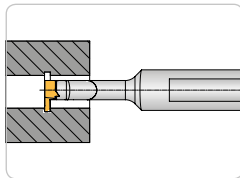
Porte-outils à section 12x20

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#### Inserts

*Inserti*

Inserts de coupe

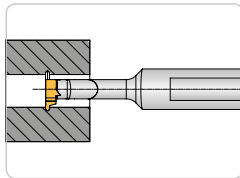


#### Grooving

*Scanalatura*

Usinage de gorges

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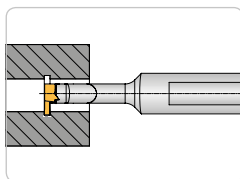


#### Full radius grooving

*Profilo a raggio pieno*

Gorges rayonnées

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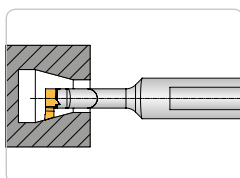


#### Cir-clip grooving DIN 471/472

*Sedi Seeger DIN 471/472*

Circlips DIN 471/472

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#### Copying 15°

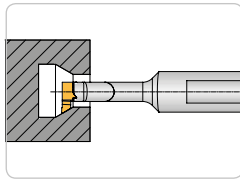
*Copiatura 15°*

Copiage 15

Page / Pagina / Page **563**

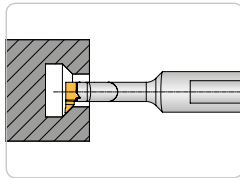


Inserts  
Inserti



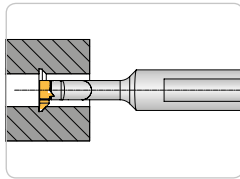
**Copying 30°**  
*Copiatura 30°*  
Copiage 30°

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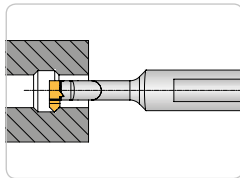
**Copying 45°**  
*Copiatura 45°*  
Copiage 45°

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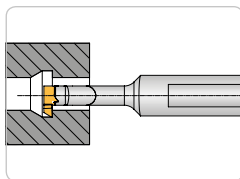
**Pre-grooving and chamfering**  
*Pre-scanalatura e smusso*  
Ébauche et chanfreinage

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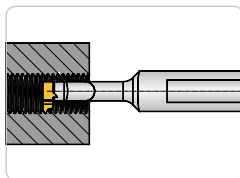
**45° chamfering**  
*Smussatura 45°*  
Chanfreinage 45°

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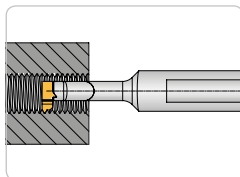
**Back Turning**  
*Lavorazione in tirata*  
Tournage en tirant

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**Threading 60° – metric, partial profile**  
*Filettatura 60° – metrica, profilo parziale*  
Filetage 60° – profil partiel, métrique

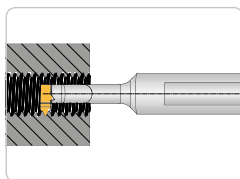
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**Threading 60° – metric, full profile**  
*Filettatura 60° – metrica, profilo completo*  
Filetage 60° – profil complet, métrique

Page / Pagina / Page **570**

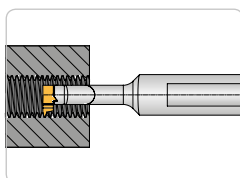
**DIN-ISO 228**



**Whitworth pipe thread 55° – full profile**  
*Filettatura Whitworth 55° – profilo completo*  
Filetage tubulaire 55° Whitworth – profil complet

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**DIN ISO 103**



**Trapezoidal 30° – partial profile**  
*Filettatura trapezia 30° – profilo parziale*  
Filetage trapézoïdal 30° – profil partiel

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Sistema di identificazione  
Système de désignation

**Boring bars**

Bareni

Barres d'alésage



| HSIMA                                 | 30  | 12                                | S                                      | R/L                   |
|---------------------------------------|---|-----------------------------------|--|-----------------------|
| <b>HSIM = SIM holder</b>              | <b>Overhand length 30 mm</b>                    | <b>Shank diameter 12 mm</b>       | <b>Design</b>                          | <b>Design</b>         |
| <b>A = Size (Z, A, B, C, D)</b>       | <i>Lunghezza sporgenza 30 mm</i>                | <i>Diametro dello stelo 12 mm</i> | <b>S = steel, otherwise carbide</b>    | <b>R = right-hand</b> |
| <i>HSIM = Supporto SIM</i>            | <i>Longueur de dépassement de l'outil 30 mm</i> | <i>Diamètre de tige 12 mm</i>     | <i>Esecuzione</i>                      | <b>L = left-hand</b>  |
| <i>A = Misura (Z, A, B, C, D)</i>     |   |                                   | <i>S = acciaio, altro metallo duro</i> | <i>Esecuzione</i>     |
| <b>HSIM = support SIM</b>             |   |                                   | <i>Modèle</i>                          | <i>R = destra</i>     |
| <i>A = dimensions (Z, A, B, C, D)</i> |   |                                   | <i>S = acier, sinon carbure</i>        | <i>L = sinistra</i>   |
|                                       |   |                                   |  | <i>Modèle</i>         |
|                                       |   |                                   |  | <i>R = droite</i>     |
|                                       |   |                                   |  | <i>L = gauche</i>     |

**Inserts**

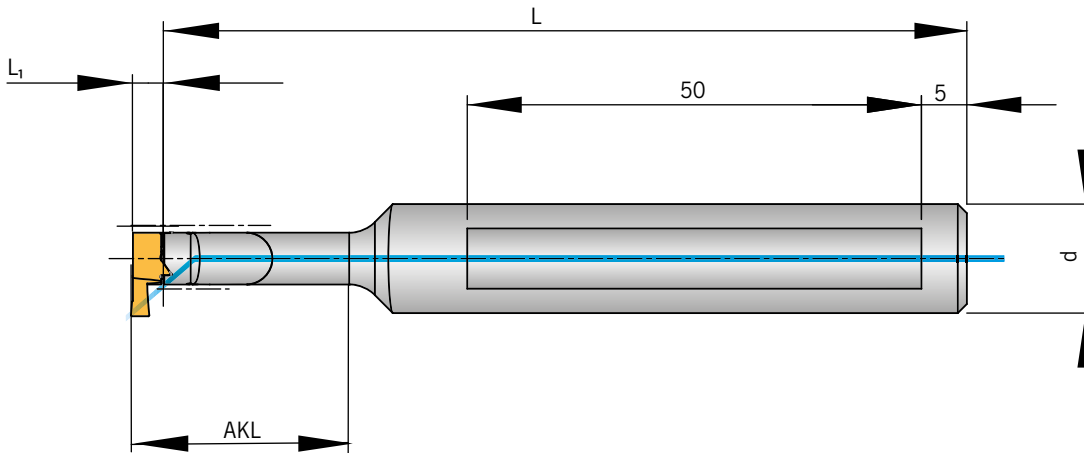
Inserti

Inserts de coupe



| SIM097A                               | V                 | 15                                    | 30                                     | 02                                | W                                     | R/L                   | AP                                 | 5020   |
|---------------------------------------|-------------------|---------------------------------------|--|-----------------------------------|---------------------------------------|-----------------------|------------------------------------|--|
| <b>SIM097 Insert</b>                  | <b>V = Radius</b> | <b>Groove width EB = 1.5 mm</b>       | <b>Cutting depth ET = 3 mm</b>         | <b>Corner radius R = 0.2 mm</b>   | <b>Location</b>                       | <b>Design</b>         | <b>ARNO® application range</b>     | <b>Grade code (ISO group)</b>                          |
| <b>A = Size (Z, A, B, C, D)</b>       | <i>V = Raggio</i> | <i>Larghezza gola EB = 1,5 mm</i>     | <i>Profondità di taglio ET = 3 mm</i>  | <i>Raggio di punta R = 0,2 mm</i> | <i>Superficie truciolo elicoidale</i> | <b>R = right-hand</b> | <i>Campi di applicazione ARNO®</i> | <i>Codice materiali da taglio (raggruppamento ISO)</i> |
| <b>SIM097 Inserto</b>                 | <i>V = rayon</i>  | <i>Largeur de rainure EB = 1,5 mm</i> | <i>Profondeur de rainure ET = 3 mm</i> | <i>Rayon d'angle R = 0,2 mm</i>   | <i>Face de coupe</i>                  | <b>L = left-hand</b>  | <i>Champ d'application ARNO®</i>   | <i>Code de matière de l'outil (Groupe ISO)</i>         |
| <i>SIM097 Insert de coupe</i>         |                   |                                       |  |                                   |                                       | <i>Esecuzione</i>     |                                    |  |
| <i>A = dimensions (Z, A, B, C, D)</i> |                   |                                       |  |                                   |                                       | <i>D = destra</i>     |                                    |  |
|                                       |                   |                                       |  |                                   |                                       | <i>S = sinistra</i>   |                                    |  |
|                                       |                   |                                       |  |                                   |                                       | <i>Modèle</i>         |                                    |  |
|                                       |                   |                                       |  |                                   |                                       | <i>R = droite</i>     |                                    |  |
|                                       |                   |                                       |  |                                   |                                       | <i>L = gauche</i>     |                                    |  |

## Boring bars - Standard / Bareni - Standard / Barres d'alésage - Standard



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

#### HSIM-Z

| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d  | L     | L <sub>1</sub> | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------------------------|----|-------|----------------|-----|-----------------------------|
| HSIMZ-1012SL/R                     | Z                             | 12 | 76,5  | 3              | 10  | SIM...Z...                  |
| HSIMZ-1812L/R                      | Z                             | 12 | 84,5  | 3              | 18  | SIM...Z...                  |
| HSIMZ-2012SL/R <sup>1)</sup>       | Z                             | 12 | 86,5  | 3              | 20  | SIM...Z...                  |
| HSIMZ-2612L/R                      | Z                             | 12 | 92,5  | 3              | 26  | SIM...Z...                  |
| HSIMZ-2612SL/R <sup>1)</sup>       | Z                             | 12 | 92,5  | 3              | 26  | SIM...Z...                  |
| HSIMZ-3612L/R                      | Z                             | 12 | 102,5 | 3              | 36  | SIM...Z...                  |

1) Steel boring bar / Corpo bareno in acciaio / Version en acier

### Holders / Utensili / Porte-outils

#### HSIM-A

| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d  | L     | L <sub>1</sub> | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------------------------|----|-------|----------------|-----|-----------------------------|
| HSIMA-1212SL/R <sup>1)</sup>       | A                             | 12 | 76,5  | 3,5            | 12  | SIM...A...                  |
| HSIMA-1512L/R                      | A                             | 12 | 79,5  | 3,5            | 15  | SIM...A...                  |
| HSIMA-2412L/R                      | A                             | 12 | 88,5  | 3,5            | 24  | SIM...A...                  |
| HSIMA-2412SL/R <sup>1)</sup>       | A                             | 12 | 88,5  | 3,5            | 24  | SIM...A...                  |
| HSIMA-3212L/R                      | A                             | 12 | 96,5  | 3,5            | 32  | SIM...A...                  |
| HSIMA-4812L/R                      | A                             | 12 | 111,5 | 3,5            | 48  | SIM...A...                  |

1) Steel boring bar / Corpo bareno in acciaio / Version en acier

### Holders / Utensili / Porte-outils

#### HSIM-B

| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d  | L     | L <sub>1</sub> | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------------------------|----|-------|----------------|-----|-----------------------------|
| HSIMB-1412SL/R <sup>1)</sup>       | B                             | 12 | 75,5  | 4,5            | 14  | SIM...B...                  |
| HSIMB-2912SL/R <sup>1)</sup>       | B                             | 12 | 90,5  | 4,5            | 29  | SIM...B...                  |
| HSIMB-4212L/R                      | B                             | 12 | 105,5 | 4,5            | 42  | SIM...B...                  |
| HSIMB-5612L/R                      | B                             | 12 | 115,5 | 4,5            | 56  | SIM...B...                  |

1) Steel boring bar / Corpo bareno in acciaio / Version en acier

## Holders / Utensili / Porte-outils

## HSIM-C

| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d  | L     | L <sub>1</sub> | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------------------------|----|-------|----------------|-----|-----------------------------|
| HSIMC-1616SL/R <sup>1)</sup>       | C                             | 16 | 77,5  | 4,5            | 16  | SIM...C...                  |
| HSIMC-3416SL/R <sup>1)</sup>       | C                             | 16 | 95,5  | 4,5            | 34  | SIM...C...                  |
| HSIMC-4516L/R                      | C                             | 16 | 105,5 | 4,5            | 45  | SIM...C...                  |
| HSIMC-6416L/R                      | C                             | 16 | 125,5 | 4,5            | 64  | SIM...C...                  |

1) Steel boring bar / Corpo bareno in acciaio / Version en acier

## Holders / Utensili / Porte-outils

## HSIM-D

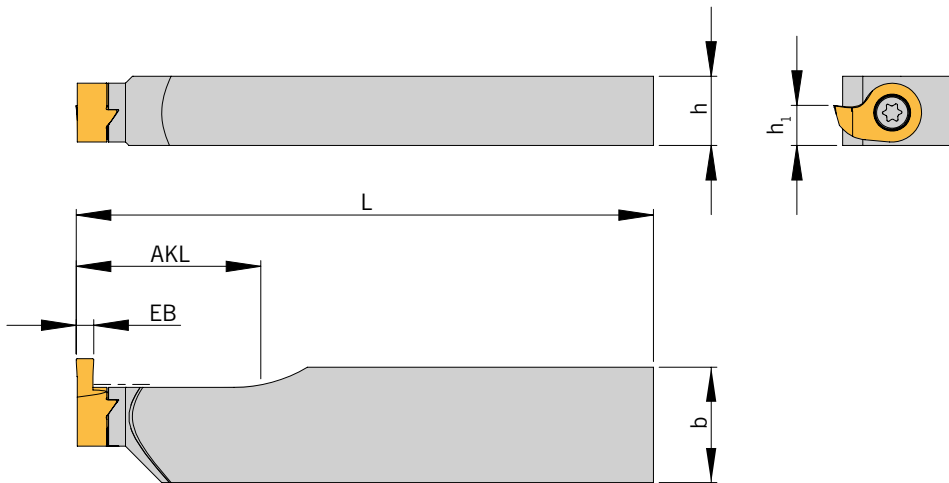
| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d  | L     | L <sub>1</sub> | AKL | Insert<br>Inserto<br>Insert |
|------------------------------------|-------------------------------|----|-------|----------------|-----|-----------------------------|
| HSIMD-1816SL/R <sup>1)</sup>       | D                             | 16 | 102,5 | 5,5            | 18  | SIM...D...                  |
| HSIMD-4016L/R                      | D                             | 16 | 124,5 | 5,5            | 40  | SIM...D...                  |
| HSIMD-4016SL/R <sup>1)</sup>       | D                             | 16 | 124,5 | 5,5            | 40  | SIM...D...                  |
| HSIMD-5616L/R                      | D                             | 16 | 124,5 | 5,5            | 56  | SIM...D...                  |
| HSIMD-8016L/R                      | D                             | 16 | 144,5 | 5,5            | 80  | SIM...D...                  |

1) Steel boring bar / Corpo bareno in acciaio / Version en acier

## Spare Parts / Ricambi / Pièces de rechange

| Boring Bars - Size<br>Bareni - Grandezza<br>Barre - Grandeur | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Nm  | Thread size<br>Filetto vite<br>Filetage |
|--|----------------------|----------------------|-----|---|
| HSIMA- ..  | AS 0031              | T5108-IP             | 1,3 | M 2,5                                   |
| HSIMB- ..  | AS 0032              | T5109-IP             | 2,2 | M 3,0                                   |
| HSIMC- ..  | AS 0033              | T5110-IP             | 3,4 | M 3,5                                   |
| HSIMD- ..  | AS 0034              | T5115-IP             | 5,0 | M 4,0                                   |
| HSIMZ- ..  | AS 0030              | T5107-IP             | 0,6 | M 2,0                                   |

Square holder / Adattatore a stelo quadro / Porte-outils à section 12x20



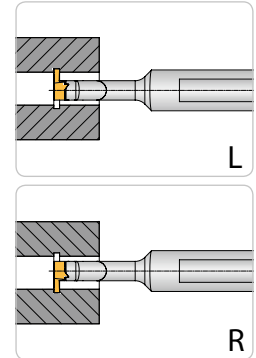
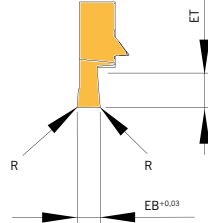
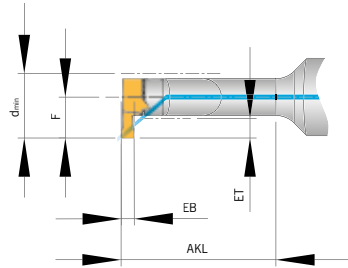
Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | F    | Size<br>Grandezza<br>Grandeur | h  | b  | AKL | L   | Insert<br>Inserto<br>Insert |
|------------------------------------|------|-------------------------------|----|----|-----|-----|-----------------------------|
| HSIMD-321220SL                     | 10,1 | D                             | 12 | 20 | 32  | 100 | SIM...D...L...              |

Spare Parts / Ricambi / Pièces de rechange

| Boring Bars - Size<br>Bareni - Grandezza<br>Barre - Grandeur | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé | Nm | Thread size<br>Filetto vite<br>Filetage |
|--|----------------------|----------------------|----|---|
| HSIMD- ..  | AS 0034              | T5115-IP             | 5  | M 4,0                                   |

Grooving / Scanalatura / Usinage de gorges



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | ET  | EB  | R    | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|------|-------|--------|--------|
|                                    |                               |                  |     |     |      |       | AP5020 | AK1020 |
| SIM067Z-0510005W L/R               | Z                             | 6,7              | 1,0 | 0,5 | 0,05 | 3,85  | ◆      | ◆      |
| SIM067Z-201001W L/R                | Z                             | 6,7              | 1,0 | 2,0 | 0,10 | 3,85  | ◆      | ◆      |
| SIM067Z-1010005W L/R               | Z                             | 6,7              | 1,0 | 1,0 | 0,05 | 3,85  | ◆      | ◆      |
| SIM067Z-1510005W L/R               | Z                             | 6,7              | 1,0 | 1,5 | 0,05 | 3,85  | ◆      | ◆      |
| SIM077Z-0520005W L/R               | Z                             | 7,7              | 2,0 | 0,5 | 0,05 | 4,85  | ◆      | ◆      |
| SIM077Z-202001W L/R                | Z                             | 7,7              | 2,0 | 2,0 | 0,10 | 4,85  | ◆      | ◆      |
| SIM077Z-1020005W L/R               | Z                             | 7,7              | 2,0 | 1,0 | 0,05 | 4,85  | ◆      | ◆      |
| SIM077Z-1520005W L/R               | Z                             | 7,7              | 2,0 | 1,5 | 0,05 | 4,85  | ◆      | ◆      |
| SIM097A-153002WR                   | A                             | 9,7              | 3,0 | 1,5 | 0,20 | 6,35  | ◆      | ◆      |
| SIM097A-203001W L/R                | A                             | 9,7              | 3,0 | 2,0 | 0,10 | 6,35  | ◆      | ◆      |
| SIM097A-253001W L/R                | A                             | 9,7              | 3,0 | 2,5 | 0,10 | 6,35  | ◆      | ◆      |
| SIM097A-303002W L/R                | A                             | 9,7              | 3,0 | 3,0 | 0,20 | 6,35  | ◆      | ◆      |
| SIM097A-1030005W L/R               | A                             | 9,7              | 3,0 | 1,0 | 0,05 | 6,35  | ◆      | ◆      |
| SIM097A-1530005W L/R               | A                             | 9,7              | 3,0 | 1,5 | 0,05 | 6,35  | ◆      | ◆      |
| SIM117B-071000W L/R                | B                             | 11,7             | 1,0 | 0,7 | 0,00 | 7,60  | ◆      | ◆      |
| SIM117B-0730005WR                  | B                             | 11,7             | 3,0 | 0,7 | 0,05 | 7,60  | ◆      | ◆      |
| SIM117B-203501W L/R                | B                             | 11,7             | 3,5 | 2,0 | 0,10 | 7,60  | ◆      | ◆      |
| SIM117B-253501W L/R                | B                             | 11,7             | 3,5 | 2,5 | 0,10 | 7,60  | ◆      | ◆      |
| SIM117B-303502W L/R                | B                             | 11,7             | 3,5 | 3,0 | 0,20 | 7,60  | ◆      | ◆      |
| SIM117B-1035005W L/R               | B                             | 11,7             | 3,5 | 1,0 | 0,05 | 7,60  | ◆      | ◆      |
| SIM117B-1535005W L/R               | B                             | 11,7             | 3,5 | 1,5 | 0,05 | 7,60  | ◆      | ◆      |
| SIM137C-204001W L/R                | C                             | 13,7             | 4,0 | 2,0 | 0,10 | 8,85  | ◆      | ◆      |
| SIM137C-254001W L/R                | C                             | 13,7             | 4,0 | 2,5 | 0,10 | 8,85  | ◆      | ◆      |
| SIM137C-304002W L/R                | C                             | 13,7             | 4,0 | 3,0 | 0,20 | 8,85  | ◆      | ◆      |
| SIM137C-1040005W L/R               | C                             | 13,7             | 4,0 | 1,0 | 0,05 | 8,85  | ◆      | ◆      |
| SIM137C-1540005W L/R               | C                             | 13,7             | 4,0 | 1,5 | 0,05 | 8,85  | ◆      | ◆      |
| SIM157D-204501W L/R                | D                             | 15,7             | 4,5 | 2,0 | 0,10 | 10,10 | ◆      | ◆      |
| SIM157D-254501W L/R                | D                             | 15,7             | 4,5 | 2,5 | 0,10 | 10,10 | ◆      | ◆      |
| SIM157D-304502W L/R                | D                             | 15,7             | 4,5 | 3,0 | 0,20 | 10,10 | ◆      | ◆      |
| SIM157D-354502W L/R                | D                             | 15,7             | 4,5 | 3,5 | 0,20 | 10,10 | ◆      | ◆      |
| SIM157D-404502W L/R                | D                             | 15,7             | 4,5 | 4,0 | 0,20 | 10,10 | ◆      | ◆      |
| SIM172D-206001W L/R                | D                             | 17,2             | 6,0 | 2,0 | 0,10 | 11,60 | ◆      | ◆      |
| SIM172D-306002W L/R                | D                             | 17,2             | 6,0 | 3,0 | 0,20 | 11,60 | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

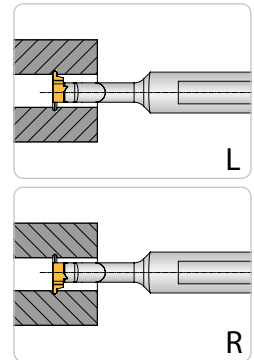
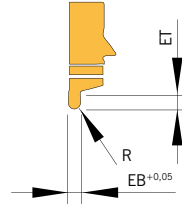
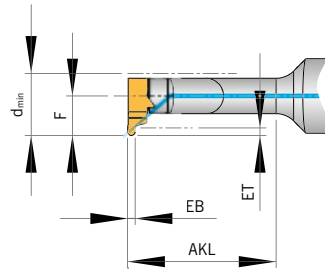
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● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

7

Radius grooving / Profilo a raggio pieno / Gorges rayonnées



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | ET  | EB  | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM097A-V-081004 L/R               | A                             | 9,7              | 1,0 | 0,8 | 0,4 | 6,35  | ◆      | ◆      |
| SIM097A-V-121006 L/R               | A                             | 9,7              | 1,0 | 1,2 | 0,6 | 6,35  | ◆      | ◆      |
| SIM097A-V-181009 L/R               | A                             | 9,7              | 1,0 | 1,8 | 0,9 | 6,35  | ◆      | ◆      |
| SIM117B-V-082504 L/R               | B                             | 11,7             | 2,5 | 0,8 | 0,4 | 7,60  | ◆      | ◆      |
| SIM117B-V-102505 L/R               | B                             | 11,7             | 2,5 | 1,0 | 0,5 | 7,60  | ◆      | ◆      |
| SIM117B-V-122506 L/R               | B                             | 11,7             | 2,5 | 1,2 | 0,6 | 7,60  | ◆      | ◆      |
| SIM117B-V-182509 L/R               | B                             | 11,7             | 2,5 | 1,8 | 0,9 | 7,60  | ◆      | ◆      |
| SIM117B-V-202510 L/R               | B                             | 11,7             | 2,5 | 2,0 | 1,0 | 7,60  | ◆      | ◆      |
| SIM117B-V-302515 L/R               | B                             | 11,7             | 2,5 | 3,0 | 1,5 | 7,60  | ◆      | ◆      |
| SIM137C-V-124006 L/R               | C                             | 13,7             | 4,0 | 1,2 | 0,6 | 8,85  | ◆      | ◆      |
| SIM137C-V-184009 L/R               | C                             | 13,7             | 4,0 | 1,8 | 0,9 | 8,85  | ◆      | ◆      |
| SIM137C-V-204010 L/R               | C                             | 13,7             | 4,0 | 2,0 | 1,0 | 8,85  | ◆      | ◆      |
| SIM137C-V-224011 L/R               | C                             | 13,7             | 4,0 | 2,2 | 1,1 | 8,85  | ◆      | ◆      |
| SIM137C-V-304015 L/R               | C                             | 13,7             | 4,0 | 3,0 | 1,5 | 8,85  | ◆      | ◆      |
| SIM157D-V-184509 L/R               | D                             | 15,7             | 4,5 | 1,8 | 0,9 | 10,10 | ◆      | ◆      |
| SIM157D-V-224511 L/R               | D                             | 15,7             | 4,5 | 2,2 | 1,1 | 10,10 | ◆      | ◆      |
| SIM157D-V-304515 L/R               | D                             | 15,7             | 4,5 | 3,0 | 1,5 | 10,10 | ◆      | ◆      |
| SIM157D-V-404520 L/R               | D                             | 15,7             | 4,5 | 4,0 | 2,0 | 10,10 | ◆      | ◆      |

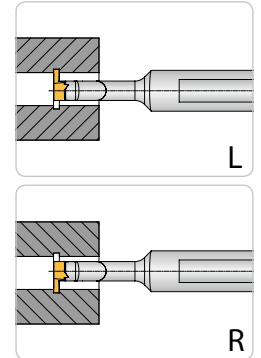
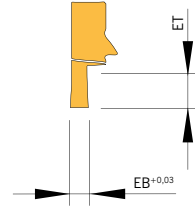
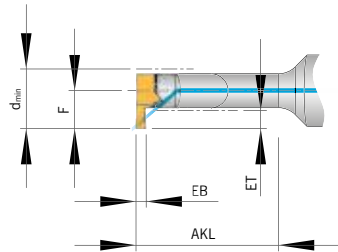
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

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| H |   |   |

● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire



Cir-clip grooving DIN 471/472 / Sedi Seeger DIN 471/472 /  
Circlips DIN 471/472



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | ET  | EB   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|------|-------|--------|--------|
|                                    |                               |                  |     |      |       | AP5020 | AK1020 |
| SIM097A-071000W L/R                | A                             | 9,7              | 1,0 | 0,73 | 6,35  | ◆      | ◆      |
| SIM097A-081000W L/R                | A                             | 9,7              | 1,0 | 0,83 | 6,35  | ◆      | ◆      |
| SIM097A-093000W L/R                | A                             | 9,7              | 3,0 | 0,93 | 6,35  | ◆      | ◆      |
| SIM097A-113000W L/R                | A                             | 9,7              | 3,0 | 1,19 | 6,35  | ◆      | ◆      |
| SIM097A-133000W L/R                | A                             | 9,7              | 3,0 | 1,39 | 6,35  | ◆      | ◆      |
| SIM097A-163000W L/R                | A                             | 9,7              | 3,0 | 1,69 | 6,35  | ◆      | ◆      |
| SIM117B-071000W L/R                | B                             | 11,7             | 1,0 | 0,70 | 7,60  | ◆      | ◆      |
| SIM117B-081000W L/R                | B                             | 11,7             | 1,0 | 0,83 | 7,60  | ◆      | ◆      |
| SIM117B-093500W L/R                | B                             | 11,7             | 3,5 | 0,93 | 7,60  | ◆      | ◆      |
| SIM117B-113500W L/R                | B                             | 11,7             | 3,5 | 1,19 | 7,60  | ◆      | ◆      |
| SIM117B-133500W L/R                | B                             | 11,7             | 3,5 | 1,39 | 7,60  | ◆      | ◆      |
| SIM117B-163500W L/R                | B                             | 11,7             | 3,5 | 1,69 | 7,60  | ◆      | ◆      |
| SIM137C-071000W L/R                | C                             | 13,7             | 1,0 | 0,73 | 8,85  | ◆      | ◆      |
| SIM137C-081000W L/R                | C                             | 13,7             | 1,0 | 0,83 | 8,85  | ◆      | ◆      |
| SIM137C-094000W L/R                | C                             | 13,7             | 4,0 | 0,93 | 8,85  | ◆      | ◆      |
| SIM137C-114000W L/R                | C                             | 13,7             | 4,0 | 1,19 | 8,85  | ◆      | ◆      |
| SIM137C-134000W L/R                | C                             | 13,7             | 4,0 | 1,39 | 8,85  | ◆      | ◆      |
| SIM137C-164000W L/R                | C                             | 13,7             | 4,0 | 1,69 | 8,85  | ◆      | ◆      |
| SIM157D-071000W L/R                | D                             | 15,7             | 1,0 | 0,73 | 10,10 | ◆      | ◆      |
| SIM157D-081000W L/R                | D                             | 15,7             | 1,0 | 0,83 | 10,10 | ◆      | ◆      |
| SIM157D-094500W L/R                | D                             | 15,7             | 4,5 | 0,93 | 10,10 | ◆      | ◆      |
| SIM157D-114500W L/R                | D                             | 15,7             | 4,5 | 1,19 | 10,10 | ◆      | ◆      |
| SIM157D-134500W L/R                | D                             | 15,7             | 4,5 | 1,39 | 10,10 | ◆      | ◆      |
| SIM157D-164500W L/R                | D                             | 15,7             | 4,5 | 1,69 | 10,10 | ◆      | ◆      |

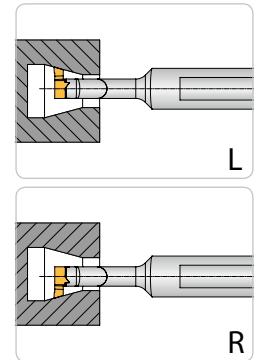
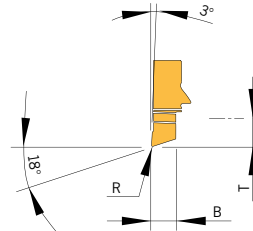
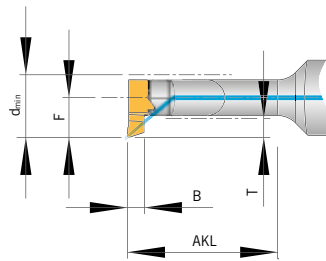
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

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| P | ● |   |
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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

7

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| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM067Z-K18-02 L/R                 | Z                             | 6,7              | 1,0 | 2,2 | 0,2 | 3,85  | ◆      | ◆      |
| SIM067Z-K18-04 L/R                 | Z                             | 6,7              | 1,0 | 2,2 | 0,4 | 3,85  | ◆      | ◆      |
| SIM097A-K18-02 L/R                 | Z                             | 9,7              | 3,0 | 2,7 | 0,2 | 6,35  | ◆      | ◆      |
| SIM117B-K18-02 L/R                 | B                             | 11,7             | 3,5 | 3,7 | 0,2 | 7,60  | ◆      | ◆      |
| SIM137C-K18-02 L/R                 | C                             | 13,7             | 4,0 | 3,7 | 0,2 | 8,85  | ◆      | ◆      |
| SIM157D-K18-02 L/R                 | D                             | 15,7             | 4,5 | 4,7 | 0,2 | 10,10 | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

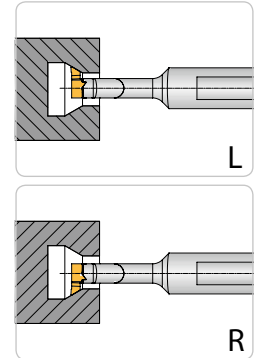
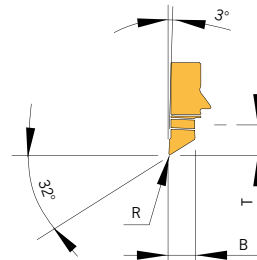
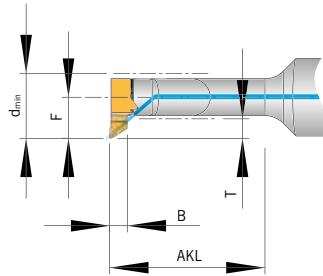
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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire





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| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM097A-K32-02 L/R                 | A                             | 9,7              | 3,0 | 2,7 | 0,2 | 6,35  | ◆      | ◆      |
| SIM117B-K32-02 L/R                 | B                             | 11,7             | 3,5 | 3,7 | 0,2 | 7,60  | ◆      | ◆      |
| SIM137C-K32-02 L/R                 | C                             | 13,7             | 4,0 | 3,7 | 0,2 | 8,85  | ◆      | ◆      |
| SIM157D-K32-02 L/R                 | D                             | 15,7             | 4,5 | 4,7 | 0,2 | 10,10 | ◆      | ◆      |

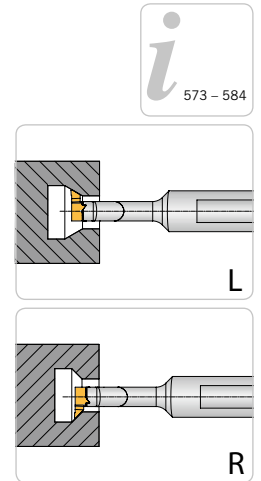
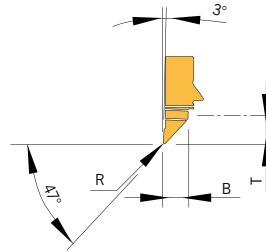
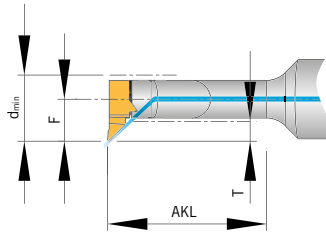
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire



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| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM097A-K47-02 L/R                 | A                             | 9,7              | 3,0 | 2,7 | 0,2 | 6,35  | ◆      | ◆      |
| SIM117B-K47-02 L/R                 | B                             | 11,7             | 3,5 | 3,7 | 0,2 | 7,60  | ◆      | ◆      |
| SIM137C-K47-02 L/R                 | C                             | 13,7             | 4,0 | 3,7 | 0,2 | 8,85  | ◆      | ◆      |
| SIM157D-K47-02 L/R                 | D                             | 15,7             | 4,5 | 4,7 | 0,2 | 10,10 | ◆      | ◆      |

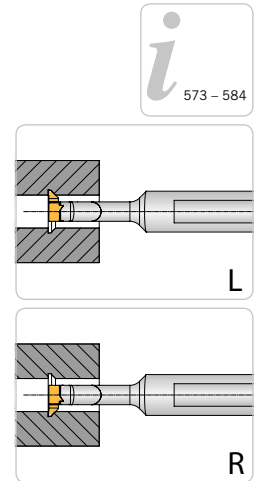
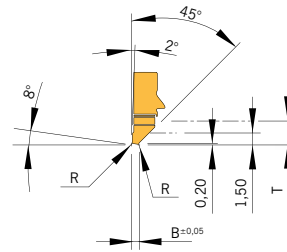
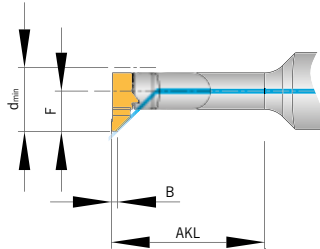
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire



**Pre-grooving and chamfering / Pre-scanalatura e smusso /**  
Ébauche et chanfreinage



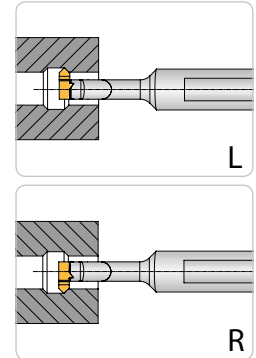
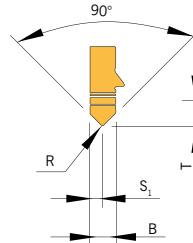
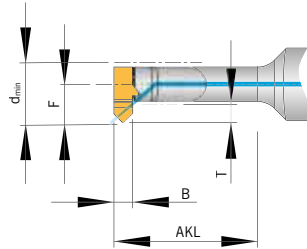
| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM097A-VF-0810-45 L/R             | A                             | 9,7              | 3,0 | 1,0 | 0,1 | 6,35  | ◆      | ◆      |
| SIM117B-VF-0810-45 L/R             | B                             | 11,7             | 3,5 | 1,0 | 0,1 | 7,60  | ◆      | ◆      |
| SIM137C-VF-0815-45 L/R             | C                             | 13,7             | 4,0 | 1,5 | 0,1 | 8,85  | ◆      | ◆      |
| SIM157D-VF-0815-45 L/R             | D                             | 15,7             | 4,5 | 1,5 | 0,1 | 10,10 | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

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| M | ● |   |
| K | ● |   |
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

Chamfering 45° / Smusso 45° / Chanfreinage 45°



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | S <sub>1</sub> | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|----------------|-------|--------|--------|
|                                    |                               |                  |     |     |     |                |       | AP5020 | AK1020 |
| SIM067Z-F45-02 L/R                 | Z                             | 6,7              | 1,0 | 2,2 | 0,2 | 1,1            | 3,85  | ◆      | ◆      |
| SIM097A-F45-02 L/R                 | A                             | 9,7              | 3,0 | 3,0 | 0,2 | 1,5            | 6,35  | ◆      | ◆      |
| SIM117B-F45-02 L/R                 | B                             | 11,7             | 3,5 | 4,0 | 0,2 | 2,0            | 7,60  | ◆      | ◆      |
| SIM137C-F45-02 L/R                 | C                             | 13,7             | 4,0 | 4,0 | 0,2 | 2,0            | 8,85  | ◆      | ◆      |
| SIM157D-F45-02 L/R                 | D                             | 15,7             | 4,5 | 5,0 | 0,2 | 2,5            | 10,10 | ◆      | ◆      |

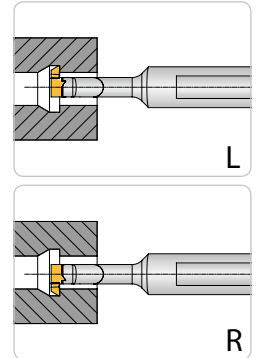
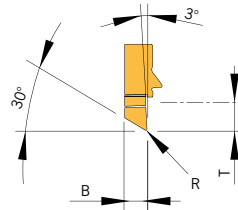
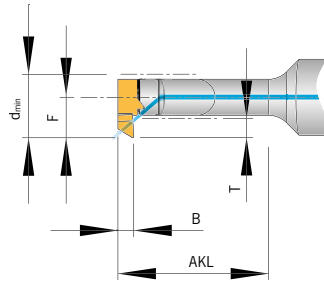
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| K | ● |   |
| N | ○ | ● |
| S | ● |   |
| H |   |   |

● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire



Back turning / Lavorazione in tirata / Tournage en tirant



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | T   | B   | R   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|-----|-----|-----|-------|--------|--------|
|                                    |                               |                  |     |     |     |       | AP5020 | AK1020 |
| SIM067Z-R30-01 L/R                 | Z                             | 6,7              | 1,0 | 2,5 | 0,1 | 3,85  | ◆      | ◆      |
| SIM097A-R30-02 L/R                 | A                             | 9,7              | 3,0 | 2,5 | 0,2 | 6,35  | ◆      | ◆      |
| SIM117B-R30-02 L/R                 | B                             | 11,7             | 3,5 | 3,5 | 0,2 | 7,60  | ◆      | ◆      |
| SIM137C-R30-02 L/R                 | C                             | 13,7             | 4,0 | 3,5 | 0,2 | 8,85  | ◆      | ◆      |
| SIM157D-R30-02 L/R                 | D                             | 15,7             | 4,5 | 4,5 | 0,2 | 10,10 | ◆      | ◆      |

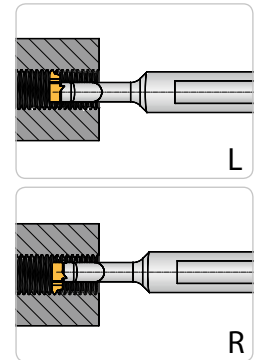
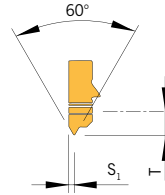
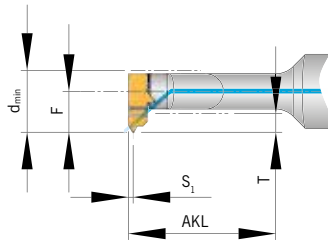
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

**Threading 60° / Filettatura 60° / Filetage 60°**

**Metric, partial profile / Metrica, profilo parziale / Profil partiel, métrique**



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | Type<br>Tipo<br>Type | P Pitch<br>P Passo<br>P Pas | S <sub>1</sub> | T   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|----------------------|-----------------------------|----------------|-----|-------|--------|--------|
|                                    |                               |                  |                      |                             |                |     |       | AP5020 | AK1020 |
| SIM067Z-G-M125 L/R                 | Z                             | 6,7              | M                    | 1,25                        | 0,8            | 1,0 | 3,85  | ◆      | ◆      |
| SIM067Z-G-MF050100 L/R             | Z                             | 6,7              | MF                   | 0,50 - 1                    | 0,8            | 1,0 | 3,85  | ◆      | ◆      |
| SIM080A-G-M150175 L/R              | A                             | 8,0              | M                    | 1,50 - 1.75                 | 1,0            | 1,8 | 4,85  | ◆      | ◆      |
| SIM080A-G-MF050075 L/R             | A                             | 8,0              | MF                   | 0,50 - 0.75                 | 0,8            | 1,8 | 4,85  | ◆      | ◆      |
| SIM080A-G-MF100125 L/R             | A                             | 8,0              | MF                   | 1,00 - 1.25                 | 0,8            | 1,8 | 4,85  | ◆      | ◆      |
| SIM107B-G-M200 L/R                 | B                             | 10,7             | M                    | 2,00                        | 1,3            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-M250 L/R                 | B                             | 10,7             | M                    | 2,50                        | 1,4            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-MF050075 L/R             | B                             | 10,7             | MF                   | 0,50 - 0.75                 | 0,8            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-MF100125 L/R             | B                             | 10,7             | MF                   | 1,00 - 1.25                 | 0,8            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-MF150175 L/R             | B                             | 10,7             | MF                   | 1,50 - 1.75                 | 1,0            | 3,0 | 6,80  | ◆      | ◆      |
| SIM137C-G-M200 L/R                 | C                             | 13,7             | M                    | 2,00                        | 1,3            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-G-M250 L/R                 | C                             | 13,7             | M                    | 2,50                        | 1,4            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-G-MF050075 L/R             | C                             | 13,7             | MF                   | 0,50 - 0.75                 | 0,8            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-G-MF100125 L/R             | C                             | 13,7             | MF                   | 1,00 - 1.25                 | 0,8            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-G-MF150175 L/R             | C                             | 13,7             | MF                   | 1,50 - 1.75                 | 1,0            | 4,2 | 8,85  | ◆      | ◆      |
| SIM157D-G-M250 L/R                 | D                             | 15,7             | M                    | 2,50                        | 1,4            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-MF200 L/R                | D                             | 15,7             | MF                   | 2,00                        | 1,3            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-MF100125 L/R             | D                             | 15,7             | MF                   | 1,00 - 1.25                 | 0,8            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-MF150175 L/R             | D                             | 15,7             | MF                   | 1,50 - 1.75                 | 1,0            | 4,7 | 10,10 | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
 HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement  
 M = ISO-Metric  
 M = Filettatura Metrica ISO  
 M = filetage intérieur ISO métrique  
 MF – ISO-Metric – Fine  
 MF – Filettatura Metrica ISO – Passo Fine  
 MF = filetage intérieur ISO métrique fin

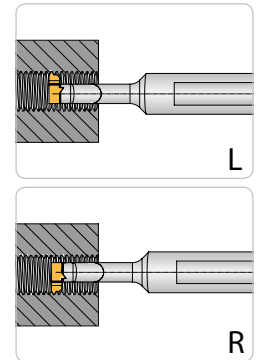
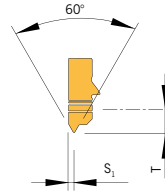
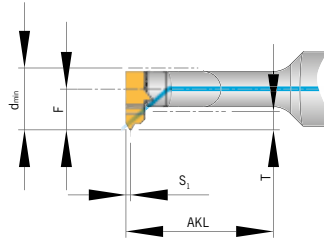
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● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



**Threading 60° / Filettatura 60° / Filetage 60°**

**Metric, full profile / Metrica, profilo completo / Profil complet, métrique**



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | Type<br>Tipo<br>Type | P Pitch<br>P Passo<br>P Pas | S <sub>1</sub> | T   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|----------------------|-----------------------------|----------------|-----|-------|--------|--------|
|                                    |                               |                  |                      |                             |                |     |       | AP5020 | AK1020 |
| SIM080A-GV-M150 L/R                | A                             | 8,0              | M                    | 1,5                         | 1,0            | 1,8 | 4,85  | ◆      | ◆      |
| SIM107B-GV-M200 L/R                | B                             | 10,7             | M                    | 2,0                         | 1,3            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-GV-M250 L/R                | B                             | 10,7             | M                    | 2,5                         | 1,4            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-GV-M300 L/R                | B                             | 10,7             | M                    | 3,0                         | 1,6            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-GV-MF100 L/R               | B                             | 10,7             | MF                   | 1,0                         | 0,8            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-GV-MF150 L/R               | B                             | 10,7             | MF                   | 1,5                         | 1,0            | 3,0 | 6,80  | ◆      | ◆      |
| SIM137C-GV-M200 L/R                | C                             | 13,7             | M                    | 2,0                         | 1,3            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-GV-M250 L/R                | C                             | 13,7             | M                    | 2,5                         | 1,4            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-GV-MF100 L/R               | C                             | 13,7             | MF                   | 1,0                         | 0,8            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-GV-MF150 L/R               | C                             | 13,7             | MF                   | 1,5                         | 1,0            | 4,2 | 8,85  | ◆      | ◆      |
| SIM157D-GV-M250 L/R                | D                             | 15,7             | M                    | 2,5                         | 1,4            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-M300 L/R                | D                             | 15,7             | M                    | 3,0                         | 1,6            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-M350 L/R                | D                             | 15,7             | M                    | 3,5                         | 1,8            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-M400 L/R                | D                             | 15,7             | M                    | 4,0                         | 2,0            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-MF100 L/R               | D                             | 15,7             | MF                   | 1,0                         | 0,8            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-MF150 L/R               | D                             | 15,7             | MF                   | 1,5                         | 1,0            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-GV-MF200 L/R               | D                             | 15,7             | MF                   | 2,0                         | 1,3            | 4,7 | 10,10 | ◆      | ◆      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
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 M = ISO-Metric  
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 M = filetage intérieur ISO métrique  
 MF – ISO-Metric – Fine  
 MF – Filettatura Metrica ISO – Passo Fine  
 MF = filetage intérieur ISO métrique fin

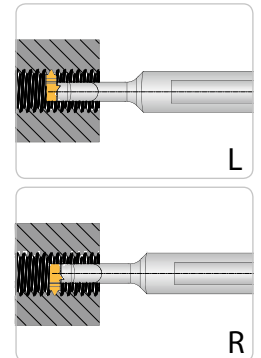
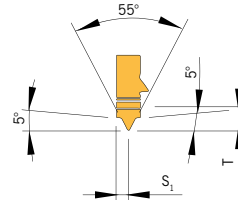
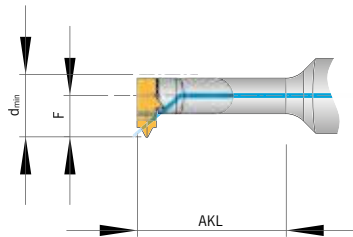
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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

7

**Whitworth pipe thread 55° / Filettatura Whitworth 55° /**  
**Filetage tubulaire 55° Whitworth**

**DIN ISO 228 - full profile / DIN ISO 228 - profilo completo /**  
 DIN ISO 228 - profil complet



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | Type<br>Tipo<br>Type | P Pitch<br>P Passo<br>P Pas | TPI<br>G/Inch<br>G/Inch | S <sub>1</sub> | T   | F    | HC     | HU     |
|------------------------------------|-------------------------------|------------------|----------------------|-----------------------------|-------------------------|----------------|-----|------|--------|--------|
|                                    |                               |                  |                      |                             |                         |                |     |      | AP5020 | AK1020 |
| SIM107B-GV-W228/14 L/R             | B                             | 10,7             | W228                 | 1,814                       | 14                      | 1,6            | 3,0 | 6,8  | ◆      | ◆      |
| SIM107B-GV-W228/19 L/R             | B                             | 10,7             | W228                 | 1,337                       | 19                      | 1,3            | 3,0 | 6,8  | ◆      | ◆      |
| SIM157D-GV-W228/11 L/R             | D                             | 15,7             | W228                 | 2,309                       | 11                      | 2,0            | 4,7 | 10,1 | ◆      | ◆      |
| SIM157D-GV-W228/14 L/R             | D                             | 15,7             | W228                 | 1,814                       | 14                      | 1,6            | 4,7 | 10,1 | ◆      | ◆      |

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|   |   |   |
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| P | ● |   |
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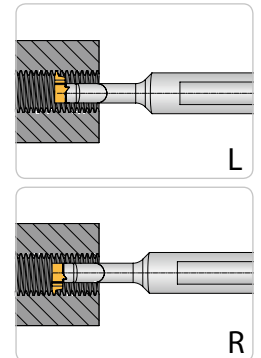
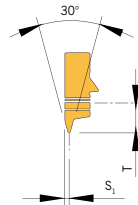
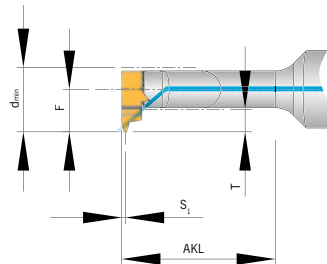
● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire





**Trapezoidal 30° / Filettatura Trapezoidale 30° /**  
Filetage trapézoïdal 30°

**DIN ISO 103-Partial profile / DIN ISO 103-Profilo parziale / DIN ISO 103 - profil partiel**



| Designation<br>Articolo<br>Article | Size<br>Grandezza<br>Grandeur | d <sub>min</sub> | Type<br>Tipo<br>Type | P Pitch<br>P Passo<br>P Pas | S <sub>1</sub> | T   | F     | HC     | HU     |
|------------------------------------|-------------------------------|------------------|----------------------|-----------------------------|----------------|-----|-------|--------|--------|
|                                    |                               |                  |                      |                             |                |     |       | AP5020 | AK1020 |
| SIM082A-G-TR103/1,5 L/R            | A                             | 8,2              | TR103                | 1,5                         | 0,6            | 1,9 | 4,85  | ◆      | ◆      |
| SIM087A-G-TR103/2,0 L/R            | A                             | 8,7              | TR103                | 2,0                         | 1,0            | 2,4 | 4,85  | ◆      | ◆      |
| SIM087A-G-TR103/3,0 L/R            | A                             | 8,7              | TR103                | 3,0                         | 1,2            | 2,4 | 4,85  | ◆      | ◆      |
| SIM107B-G-TR103/1,5 L/R            | B                             | 10,7             | TR103                | 1,5                         | 0,6            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-TR103/2,0 L/R            | B                             | 10,7             | TR103                | 2,0                         | 1,0            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-TR103/3,0 L/R            | B                             | 10,7             | TR103                | 3,0                         | 1,2            | 3,0 | 6,80  | ◆      | ◆      |
| SIM107B-G-TR103/4,0 L/R            | B                             | 10,7             | TR103                | 4,0                         | 1,6            | 3,0 | 6,80  | ◆      | ◆      |
| SIM137C-G-TR103/4,0 L/R            | C                             | 13,7             | TR103                | 4,0                         | 1,6            | 4,2 | 8,85  | ◆      | ◆      |
| SIM137C-G-TR103/5,0 L/R            | C                             | 13,7             | TR103                | 5,0                         | 2,0            | 4,2 | 8,85  | ◆      | ◆      |
| SIM157D-G-TR103/2,0 L/R            | D                             | 15,7             | TR103                | 2,0                         | 1,0            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-TR103/3,0 L/R            | D                             | 15,7             | TR103                | 3,0                         | 1,2            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-TR103/4,0 L/R            | D                             | 15,7             | TR103                | 4,0                         | 1,6            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-TR103/5,0 L/R            | D                             | 15,7             | TR103                | 5,0                         | 2,0            | 4,7 | 10,10 | ◆      | ◆      |
| SIM157D-G-TR103/6,0 L/R            | D                             | 15,7             | TR103                | 6,0                         | 2,2            | 4,7 | 10,10 | ◆      | ◆      |

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|   |   |   |
|---|---|---|
| P | ● |   |
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● Main application  
 Applicazione principale  
 Application principale  
 ○ Secondary application  
 Applicazione secondaria  
 Application secondaire

7

| Material group | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                |
|----------------|---|---|---------------------|--|----------------|--------------------------|----------------|
|                |   |   |                     |  |                | HC                       | HU             |
|                |   |   |                     |  |                | AP5020                   | AK1020         |
| <b>P</b>       | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 20 - 100 - 180           | 20 - 75 - 130  |
|                |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 20 - 100 - 180           | 20 - 75 - 130  |
|                |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 20 - 100 - 180           | 20 - 75 - 130  |
|                |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 20 - 100 - 180           | 20 - 75 - 130  |
|                |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 20 - 100 - 180           | 20 - 75 - 130  |
|                |   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | 20 - 100 - 180           | 20 - 75 - 130  |
|                | Low alloyed steel   | annealed  | 175                 | 591                                      | P7             | 15 - 90 - 160            | 15 - 65 - 110  |
|                |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 15 - 90 - 160            | 15 - 65 - 110  |
|                |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 15 - 90 - 160            | 15 - 65 - 110  |
|                |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 15 - 90 - 160            | 15 - 65 - 110  |
|                | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 20 - 70 - 120            | 20 - 55 - 85   |
|                |   | hardened  | 300                 | 1013                                     | P12            | 20 - 70 - 120            | 20 - 55 - 85   |
|                |   | hardened  | 400                 | 1361                                     | P13            | 20 - 70 - 120            | 20 - 55 - 85   |
|                | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | 20 - 55 - 90             | 20 - 40 - 60   |
|                |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | 20 - 100 - 180           | 20 - 40 - 60   |
| <b>M</b>       | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | 15 - 50 - 80             | 15 - 45 - 70   |
|                |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | 20 - 65 - 110            | 15 - 50 - 80   |
|                |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | 10 - 35 - 60             | 10 - 25 - 40   |
| <b>K</b>       | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | 20 - 85 - 150            | 20 - 70 - 120  |
|                |   | pearlitic                                       | 260                 | 867                                      | K2             | 20 - 85 - 150            | 20 - 70 - 120  |
|                | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | 20 - 90 - 160            | 20 - 65 - 110  |
|                |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 20 - 90 - 160            | 20 - 65 - 110  |
|                | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | 20 - 85 - 150            | 20 - 65 - 110  |
|                |   | pearlitic                                       | 265                 | 885                                      | K6             | 20 - 85 - 150            | 20 - 65 - 110  |
|                | GGV (CGI)   |   | 200                 | 675                                      | K7             | 20 - 85 - 150            | 20 - 70 - 120  |
| <b>N</b>       | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | 20 - 310 - 600           | 20 - 260 - 500 |
|                |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | 20 - 310 - 600           | 20 - 260 - 500 |
|                |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | 20 - 310 - 600           | 20 - 260 - 500 |
|                | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | 20 - 310 - 600           | 20 - 260 - 500 |
|                |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | 20 - 310 - 600           | 20 - 260 - 500 |
|                | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -              |
|                |   | Unalloyed, elektrolyte copper                   | 100                 | 343                                      | N7             | 20 - 310 - 600           | 15 - 260 - 500 |
|                | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | 20 - 310 - 600           | 15 - 260 - 500 |
|                |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | 20 - 310 - 600           | 15 - 260 - 500 |
|                |   |   | 300                 | 1013                                     | N10            | -                        | -              |
|                | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -              |
|                |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -              |
|                |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -              |
|                |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -              |
|                |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -              |
|                |   | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -              |
| <b>S</b>       | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | 15 - 45 - 75             | 15 - 25 - 30   |
|                |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | 15 - 45 - 75             | 15 - 25 - 30   |
|                |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | 15 - 30 - 40             | 15 - 30 - 40   |
|                |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | 15 - 30 - 40             | 15 - 30 - 40   |
|                |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | 15 - 30 - 40             | 15 - 30 - 40   |
|                | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -              |
|                |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -              |
|                |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -              |
|                | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -              |
|                | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -              |
| <b>H</b>       | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -              |
|                |   | hardened  | 55 HRC              | -  | H2             | -                        | -              |
|                |   | hardened  | 60 HRC              | -  | H3             | -                        | -              |
|                | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -              |

The recommended cutting data are only approximate values.  
 It may be necessary to adjust them to each individual machining application.  
 HC = Solid carbide coated  
 HU = Solid carbide uncoated



| Gruppo materiale        | Struttura dei gruppi di materiali e lettere di riferimento |  | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                |
|-------------------------|--|--|-----------------|------------------------------------|------------------|-------------------------------|----------------|
|                         |  |  |                 |                                    |                  | HC                            | HU             |
|                         |  |  |                 |                                    |                  | AP5020                        | AK1020         |
| <b>P</b>                | Acciai non legato  | C ≤ 0,25 % ricotto                               | 125             | 428                                | P1               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         |  | C > 0,25 ... >= 0,55 % ricotto                   | 190             | 639                                | P2               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         |  | C > 0,25 ... >= 0,55 % bonificato                | 210             | 708                                | P3               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         |  | C ≤ 0,55 % ricotto                               | 190             | 639                                | P4               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         |  | C ≤ 0,55 % bonificato                            | 300             | 1013                               | P5               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         |  | Acciaio (truciolo corto) ricotto                 | 220             | 745                                | P6               | 20 - 100 - 180                | 20 - 75 - 130  |
|                         | Acciai debolmente legati                                   | ricotto  | 175             | 591                                | P7               | 15 - 90 - 160                 | 15 - 65 - 110  |
|                         |  | bonificato                                       | 300             | 1013                               | P8               | 15 - 90 - 160                 | 15 - 65 - 110  |
|                         |  | bonificato                                       | 380             | 1282                               | P9               | 15 - 90 - 160                 | 15 - 65 - 110  |
|                         |  | bonificato                                       | 430             | 1477                               | P10              | 15 - 90 - 160                 | 15 - 65 - 110  |
|                         | Acciai fortemente legati e acciai da utensili              | ricotto  | 200             | 675                                | P11              | 20 - 70 - 120                 | 20 - 55 - 85   |
|                         |  | temprato e rinvenuto                             | 300             | 1013                               | P12              | 20 - 70 - 120                 | 20 - 55 - 85   |
|                         |  | temprato e rinvenuto                             | 400             | 1361                               | P13              | 20 - 70 - 120                 | 20 - 55 - 85   |
|                         | Acciai inossidabili  | ferritico / martensitico, ricotto                | 200             | 675                                | P14              | 20 - 55 - 90                  | 20 - 40 - 60   |
|                         |  | martensitico, bonificato                         | 330             | 1114                               | P15              | 20 - 100 - 180                | 20 - 40 - 60   |
| <b>M</b>                | Acciai inossidabili  | austenitico, trattato o temerato                 | 200             | 675                                | M1               | 15 - 50 - 80                  | 15 - 45 - 70   |
|                         |  | austenitico, indurimento per precipitazione (PH) | 300             | 1013                               | M2               | 20 - 65 - 110                 | 15 - 50 - 80   |
|                         |  | austenitico-ferritico, Duplex                    | 230             | 778                                | M3               | 10 - 35 - 60                  | 10 - 25 - 40   |
| <b>K</b>                | Ghisa temprata   | ferritico  | 200             | 675                                | K1               | 20 - 85 - 150                 | 20 - 70 - 120  |
|                         |  | perlitica  | 260             | 867                                | K2               | 20 - 85 - 150                 | 20 - 70 - 120  |
|                         | Ghisa grigia   | bassa resistenza                                 | 180             | 602                                | K3               | 20 - 90 - 160                 | 20 - 65 - 110  |
|                         |  | alta resistenza / austenitico                    | 245             | 825                                | K4               | 20 - 90 - 160                 | 20 - 65 - 110  |
|                         | Ghisa sferoidale   | ferritico  | 155             | 518                                | K5               | 20 - 85 - 150                 | 20 - 65 - 110  |
|                         |  | perlitica  | 265             | 885                                | K6               | 20 - 85 - 150                 | 20 - 65 - 110  |
| GGV (CGI)               |  | 200  | 675             | K7                                 | 20 - 85 - 150    | 20 - 70 - 120                 |                |
| <b>N</b>                | Leghe di Alluminio stampato                                | non invecchiato                                  | 30              | -                                  | N1               | 20 - 310 - 600                | 20 - 260 - 500 |
|                         |  | rinvenuto, invecchiato                           | 100             | 343                                | N2               | 20 - 310 - 600                | 20 - 260 - 500 |
|                         | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                       | 75              | 260                                | N3               | 20 - 310 - 600                | 20 - 260 - 500 |
|                         |  | ≤ 12 % Si, rinvenuto, invecchiato                | 90              | 314                                | N4               | 20 - 310 - 600                | 20 - 260 - 500 |
|                         | Leghe di magnesio  | > 12 % Si, non invecchiato                       | 130             | 447                                | N5               | 20 - 310 - 600                | 20 - 260 - 500 |
|                         |  | > 12 % Si, non invecchiato                       | 70              | 250                                | N6               | -                             | -              |
|                         | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                   | 100             | 343                                | N7               | 20 - 310 - 600                | 15 - 260 - 500 |
|                         |  | Ottone, Bronzo                                   | 90              | 314                                | N8               | 20 - 310 - 600                | 15 - 260 - 500 |
|                         |  | Leghe Cu, truciolo corto                         | 110             | 382                                | N9               | 20 - 310 - 600                | 15 - 260 - 500 |
|                         |  |  | 300             | 1013                               | N10              | -                             | -              |
| Materiali non metallici | Leghe al piombo (senza materiale di riempimento abrasivo)  | -  | -               | N11                                | -                | -                             |                |
|                         | Duroplastico (senza materiale di riempimento abrasivo)     | -  | -               | N12                                | -                | -                             |                |
|                         | Plastica rinforzata in fibra di vetro GFRP                 | -  | -               | N13                                | -                | -                             |                |
|                         | Plastica rinforzata in fibra di carbonio CFRP              | -  | -               | N14                                | -                | -                             |                |
|                         | Plastica rinforzata in fibra aramidica AFRP                | -  | -               | N15                                | -                | -                             |                |
|                         | Grafite (tecnico)  | 80 Shore   | -               | N16                                | -                | -                             |                |
| <b>S</b>                | Leghe resistenti al calore                                 | Base-Fe ricotto                                  | 200             | 675                                | S1               | 15 - 45 - 75                  | 15 - 25 - 30   |
|                         |  | Base-Fe invecchiato                              | 280             | 943                                | S2               | 15 - 45 - 75                  | 15 - 25 - 30   |
|                         |  | Base Ni o Co ricotto                             | 250             | 839                                | S3               | 15 - 30 - 40                  | 15 - 30 - 40   |
|                         |  | Base Ni o Co invecchiato                         | 350             | 1177                               | S4               | 15 - 30 - 40                  | 15 - 30 - 40   |
|                         |  | Base Ni o Co da fusione                          | 320             | 1076                               | S5               | 15 - 30 - 40                  | 15 - 30 - 40   |
|                         | Leghe di Titanio   | Titanio puro                                     | 200             | 675                                | S6               | -                             | -              |
|                         |  | Leghe α e β, invecchiato                         | 375             | 1262                               | S7               | -                             | -              |
|                         |  | Leghe β  | 410             | 1396                               | S8               | -                             | -              |
|                         | Leghe di tungsteno   |  | 300             | 1013                               | S9               | -                             | -              |
|                         | Leghe di molibdeno   |  | 300             | 1013                               | S10              | -                             | -              |
| <b>H</b>                | Acciaio Temprato   | temprato e rinvenuto                             | 50 HRC          | -                                  | H1               | -                             | -              |
|                         |  | temprato e rinvenuto                             | 55 HRC          | -                                  | H2               | -                             | -              |
|                         |  | temprato e rinvenuto                             | 60 HRC          | -                                  | H3               | -                             | -              |
|                         | Ghisa Temprata   | temprato e rinvenuto                             | 55 HRC          | -                                  | H4               | -                             | -              |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

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| Groupe de matériaux       | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                |
|---------------------------|--|---|----------------|------------------------------------|-------------------|-----------------------------|----------------|
|                           |  |   |                |                                    |                   | HC                          | HU             |
|                           |  |   |                |                                    |                   | AP5020                      | AK1020         |
| <b>P</b>                  | Acier non allié  | C ≤ 0,25 % recuit                               | 125            | 428                                | P1                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           |  | C > 0,25 ... >= 0,55 % recuit                   | 190            | 639                                | P2                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           |  | C > 0,25 ... >= 0,55 % traité                   | 210            | 708                                | P3                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           |  | C ≤ 0,55 % recuit                               | 190            | 639                                | P4                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           |  | C ≤ 0,55 % traité                               | 300            | 1013                               | P5                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           |  | Aciers de décolletage (à copeaux courts) recuit | 220            | 745                                | P6                | 20 - 100 - 180              | 20 - 75 - 130  |
|                           | Acier faiblement allié   | recuit  | 175            | 591                                | P7                | 15 - 90 - 160               | 15 - 65 - 110  |
|                           |  | traité  | 300            | 1013                               | P8                | 15 - 90 - 160               | 15 - 65 - 110  |
|                           |  | traité  | 380            | 1282                               | P9                | 15 - 90 - 160               | 15 - 65 - 110  |
|                           |  | traité  | 430            | 1477                               | P10               | 15 - 90 - 160               | 15 - 65 - 110  |
|                           | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | 20 - 70 - 120               | 20 - 55 - 85   |
|                           |  | trempe et revenu                                | 300            | 1013                               | P12               | 20 - 70 - 120               | 20 - 55 - 85   |
|                           |  | trempe et revenu                                | 400            | 1361                               | P13               | 20 - 70 - 120               | 20 - 55 - 85   |
|                           | Acier inox   | ferritique, martensitique, recuit               | 200            | 675                                | P14               | 20 - 55 - 90                | 20 - 40 - 60   |
|                           |  | martensitique, traité                           | 330            | 1114                               | P15               | 20 - 100 - 180              | 20 - 40 - 60   |
| <b>M</b>                  | Acier inox   | austénitique                                    | 200            | 675                                | M1                | 15 - 50 - 80                | 15 - 45 - 70   |
|                           |  | austénitique                                    | 300            | 1013                               | M2                | 20 - 65 - 110               | 15 - 50 - 80   |
|                           |  | austénitique-ferritique, Duplex                 | 230            | 778                                | M3                | 10 - 35 - 60                | 10 - 25 - 40   |
| <b>K</b>                  | Fonte malléable  | ferritique                                      | 200            | 675                                | K1                | 20 - 85 - 150               | 20 - 70 - 120  |
|                           |  | perlitique                                      | 260            | 867                                | K2                | 20 - 85 - 150               | 20 - 70 - 120  |
|                           | Fonte grise  | faible résistance                               | 180            | 602                                | K3                | 20 - 90 - 160               | 20 - 65 - 110  |
|                           |  | haute résistance / austénitique                 | 245            | 825                                | K4                | 20 - 90 - 160               | 20 - 65 - 110  |
|                           | Fonte à Graphite sphéroïdale                                   | ferritique                                      | 155            | 518                                | K5                | 20 - 85 - 150               | 20 - 65 - 110  |
|                           |  | perlitique                                      | 265            | 885                                | K6                | 20 - 85 - 150               | 20 - 65 - 110  |
| GGV (CGI)                 |  | 200   | 675            | K7                                 | 20 - 85 - 150     | 20 - 70 - 120               |                |
| <b>N</b>                  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30             | -                                  | N1                | 20 - 310 - 600              | 20 - 260 - 500 |
|                           |  | pouvant subir un durcissement, durci            | 100            | 343                                | N2                | 20 - 310 - 600              | 20 - 260 - 500 |
|                           |  | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75             | 260                                | N3                | 20 - 310 - 600              | 20 - 260 - 500 |
|                           | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, pouvant subir un durcissement, durci | 90             | 314                                | N4                | 20 - 310 - 600              | 20 - 260 - 500 |
|                           |  | > 12 % Si, ne pouvant pas subir de durcissement | 130            | 447                                | N5                | 20 - 310 - 600              | 20 - 260 - 500 |
|                           | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement | 70             | 250                                | N6                | -                           | -              |
|                           | Cuivre et alliage de cuivre (bronze / laiton)                  | non allié, cuivre électrolytique                | 100            | 343                                | N7                | 20 - 310 - 600              | 15 - 260 - 500 |
|                           |  | Laiton, bronze, fonte rouge                     | 90             | 314                                | N8                | 20 - 310 - 600              | 15 - 260 - 500 |
|                           |  | Alliage de cuivre à copeaux courts              | 110            | 382                                | N9                | 20 - 310 - 600              | 15 - 260 - 500 |
|                           |  | forte résistance, Ampco                         | 300            | 1013                               | N10               | -                           | -              |
| Matériaux non métalliques | Thermoplaste (sans agents de charge abrasives)                 | -   | -              | N11                                | -                 | -                           |                |
|                           | Duroplaste (sans agents de charge abrasives)                   | -   | -              | N12                                | -                 | -                           |                |
|                           | Matière plastique renforcée de fibres de verre GFRP            | -   | -              | N13                                | -                 | -                           |                |
|                           | Matière plastique renforcée composite CFRP                     | -   | -              | N14                                | -                 | -                           |                |
|                           | Plastique renforcé fibre aramide AFRP                          | -   | -              | N15                                | -                 | -                           |                |
|                           | Graphite   | 80 Shore  | -              | N16                                | -                 | -                           |                |
| <b>S</b>                  | Alliages réfractaires  | à base de Fe recuit                             | 200            | 675                                | S1                | 15 - 45 - 75                | 15 - 25 - 30   |
|                           |  | à base de Fe durci                              | 280            | 943                                | S2                | 15 - 45 - 75                | 15 - 25 - 30   |
|                           |  | à base Ni ou Co recuit                          | 250            | 839                                | S3                | 15 - 30 - 40                | 15 - 30 - 40   |
|                           |  | à base Ni ou Co durci                           | 350            | 1177                               | S4                | 15 - 30 - 40                | 15 - 30 - 40   |
|                           |  | à base Ni ou Co jeter                           | 320            | 1076                               | S5                | 15 - 30 - 40                | 15 - 30 - 40   |
|                           | Alliage de titane  | Titane pur                                      | 200            | 675                                | S6                | -                           | -              |
|                           |  | Alliages Alpha + Beta, trempé                   | 375            | 1262                               | S7                | -                           | -              |
|                           |  | Alliages Beta                                   | 410            | 1396                               | S8                | -                           | -              |
|                           | Alliage de tungstène   |   | 300            | 1013                               | S9                | -                           | -              |
|                           | Alliage de molybdène   |   | 300            | 1013                               | S10               | -                           | -              |
| <b>H</b>                  | Acier trempé   | trempe et revenu                                | 50 HRC         | -                                  | H1                | -                           | -              |
|                           |  | trempe et revenu                                | 55 HRC         | -                                  | H2                | -                           | -              |
|                           |  | trempe et revenu                                | 60 HRC         | -                                  | H3                | -                           | -              |
|                           | Fonte durci  | trempe et revenu                                | 55 HRC         | -                                  | H4                | -                           | -              |

Les données affichées dans le tableau sont des valeurs approximatives.  
 Il peut être nécessaire de les adapter à des applications d'usinage individuelles.  
 HC = Carbure avec revêtement  
 HU = Carbure sans revêtement



| Material group                     | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed V <sub>c</sub> (m/min) |                 |   |
|------------------------------------|---|---|---------------------|--|----------------|--------------------------------------|-----------------|---|
|                                    |   |   |                     |  |                | coated                               | uncoated        |   |
|                                    |   |   |                     |  |                | AP5020                               | AK1020          |   |
| P                                  | Unalloyed steel   | C ≤ 0.25 % annealed                         | 125                 | 428                                      | P1             | 80 - 115 - 150                       | 80 - 95 - 110   |   |
|                                    |   | C > 0.25 ... ≤ 0.55 % annealed              | 190                 | 639                                      | P2             | 80 - 115 - 150                       | 80 - 95 - 110   |   |
|                                    |   | C > 0.25 ... ≤ 0.55 % hardened and tempered | 210                 | 708                                      | P3             | 60 - 90 - 120                        | 60 - 75 - 90    |   |
|                                    |   | C > 0.55 % annealed                         | 190                 | 639                                      | P4             | 80 - 115 - 150                       | 80 - 95 - 110   |   |
|                                    |   | C > 0.55 % hardened and tempered            | 300                 | 1013                                     | P5             | 60 - 90 - 120                        | 60 - 75 - 90    |   |
|                                    |   | Machining steel (short-chipping) tempered   | 220                 | 745                                      | P6             | 80 - 115 - 150                       | 80 - 95 - 110   |   |
|                                    | Low alloyed steel   | annealed                                    | 175                 | 591                                      | P7             | 70 - 100 - 130                       | 70 - 85 - 100   |   |
|                                    |   | hardened and tempered                       | 300                 | 1013                                     | P8             | 70 - 95 - 120                        | 70 - 80 - 90    |   |
|                                    |   | hardened and tempered                       | 380                 | 1282                                     | P9             | 70 - 95 - 120                        | 70 - 80 - 90    |   |
|                                    |   | hardened and tempered                       | 430                 | 1477                                     | P10            | 70 - 95 - 115                        | 70 - 80 - 85    |   |
|                                    | High alloyed steel and high alloyed tool steel              | annealed                                    | 200                 | 675                                      | P11            | 60 - 85 - 110                        | 60 - 70 - 80    |   |
|                                    |   | hardened                                    | 300                 | 1013                                     | P12            | 50 - 70 - 90                         | 50 - 60 - 70    |   |
|                                    |   | hardened                                    | 400                 | 1361                                     | P13            | 50 - 70 - 90                         | 50 - 60 - 70    |   |
|                                    | Stainless steel   | ferritic / martensitic, annealed            | 200                 | 675                                      | P14            | 50 - 65 - 80                         | 50 - 60 - 70    |   |
| martensitic, hardened and tempered |   | 330   | 1114                | P15                                      | 50 - 65 - 80   | 50 - 60 - 70                         |                 |   |
| M                                  | Stainless steel   | austenitic, chilled                         | 200                 | 675                                      | M1             | 70 - 95 - 120                        | 70 - 80 - 90    |   |
|                                    |   | austenitic, precipitation-hardened (PH)     | 300                 | 1013                                     | M2             | 40 - 65 - 90                         | 40 - 55 - 65    |   |
|                                    |   | austenitic-ferritic, Duplex                 | 230                 | 778                                      | M3             | 10 - 35 - 60                         | 10 - 25 - 40    |   |
| K                                  | Malleable cast iron   | ferritic                                    | 200                 | 675                                      | K1             | 70 - 110 - 150                       | 70 - 90 - 110   |   |
|                                    |   | pearlitic                                   | 260                 | 867                                      | K2             | -                                    | -               |   |
|                                    | Cast iron   | low tensile strength                        | 180                 | 602                                      | K3             | -                                    | -               |   |
|                                    |   | high tensile strength / austenitic          | 245                 | 825                                      | K4             | 80 - 100 - 120                       | 80 - 90 - 100   |   |
|                                    | Cast iron with nodular graphite                             | ferritic                                    | 155                 | 518                                      | K5             | 80 - 90 - 100                        | 80 - 85 - 90    |   |
|                                    |   | pearlitic                                   | 265                 | 885                                      | K6             | 80 - 90 - 100                        | 80 - 85 - 90    |   |
| GGV (CGI)                          |   | 200   | 675                 | K7                                       | 70 - 110 - 150 | 70 - 90 - 110                        |                 |   |
| N                                  | Aluminium alloys long chipping                              | not heat treatable                          | 30                  | -  | N1             | 100 - 170 - 240                      | 100 - 170 - 240 |   |
|                                    |   | heat treatable, heat treated                | 100                 | 343                                      | N2             | 80 - 125 - 170                       | 80 - 125 - 170  |   |
|                                    | Casted aluminium alloys                                     | ≤ 12 % Si, not heat treatable               | 75                  | 260                                      | N3             | -                                    | -               |   |
|                                    |   | ≤ 12 % Si, aushärtbar, ausgehärtet          | 90                  | 314                                      | N4             | -                                    | -               |   |
|                                    |   | > 12 % Si, not heat treatable               | 130                 | 447                                      | N5             | -                                    | -               |   |
|                                    | Magnesium alloys  |   | 70                  | 250                                      | N6             | -                                    | -               |   |
|                                    | Copper and copper alloys (Brass / Bronze)                   | Unalloyed, elektrolyte copper               | 100                 | 343                                      | N7             | 100 - 175 - 250                      | 100 - 175 - 250 |   |
|                                    |   | Brass, Bronze                               | 90                  | 314                                      | N8             | 80 - 140 - 200                       | 80 - 140 - 200  |   |
|                                    |   | Cu-alloys, short-chipping                   | 110                 | 382                                      | N9             | 100 - 175 - 250                      | 100 - 175 - 250 |   |
|                                    |   | High-tensile, Ampco                         | 300                 | 1013                                     | N10            | -                                    | -               |   |
| Non-ferrous materials              | Lead alloys (without abrasive filling material)             | -   | -                   | N11                                      | -              | -                                    |                 |   |
|                                    | Duroplastic (without abrasive filling material)             | -   | -                   | N12                                      | -              | -                                    |                 |   |
|                                    | Plastic glas fibre reinforced GFRP                          | -   | -                   | N13                                      | -              | -                                    |                 |   |
|                                    | Plastic carbon fibre reinforced CFRP                        | -   | -                   | N14                                      | -              | -                                    |                 |   |
|                                    | Plastic aramid fibre reinforced AFRP                        | -   | -                   | N15                                      | -              | -                                    |                 |   |
|                                    | Graphite (tech.)  | 80 Shore                                    | -                   | N16                                      | -              | -                                    |                 |   |
| S                                  | High temperature resistant alloys                           | Fe-Basis                                    | annealed            | 200                                      | 675            | S1                                   | -               | - |
|                                    |   |   | heat treated        | 280                                      | 943            | S2                                   | -               | - |
|                                    |   | Ni- or Co-alloyed                           | annealed            | 250                                      | 839            | S3                                   | -               | - |
|                                    |   |   | heat treated        | 350                                      | 1177           | S4                                   | -               | - |
|                                    |   |   | casting             | 320                                      | 1076           | S5                                   | -               | - |
|                                    | Titanium alloys   | Pure titan                                  | 200                 | 675                                      | S6             | -                                    | -               |   |
|                                    |   | α- and β-alloys, heat treated               | 375                 | 1262                                     | S7             | -                                    | -               |   |
|                                    |   | β-alloys                                    | 410                 | 1396                                     | S8             | -                                    | -               |   |
|                                    | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                                    | -               |   |
|                                    | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                                    | -               |   |
| H                                  | Hardened steel  | hardened                                    | 50 HRC              | -  | H1             | -                                    | -               |   |
|                                    |   | hardened                                    | 55 HRC              | -  | H2             | -                                    | -               |   |
|                                    |   | hardened                                    | 60 HRC              | -  | H3             | -                                    | -               |   |
|                                    | Hardened cast iron  | hardened                                    | 55 HRC              | -  | H4             | -                                    | -               |   |

The recommended cutting data are only approximate values. It may be necessary to adjust them to each individual machining application.

| Gruppo materiale        | Struttura dei gruppi di materiali e lettere di riferimento |  | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio V <sub>c</sub> (m/min) |                 |
|-------------------------|--|--|-----------------|------------------------------------|------------------|---|-----------------|
|                         |  |  |                 |                                    |                  | rivestito                                 | non rivestito   |
|                         |  |  |                 |                                    |                  | AP5020                                    | AK1020          |
| P                       | Acciai non legato  | C ≤ 0,25 % ricotto                               | 125             | 428                                | P1               | 80 - 115 - 150                            | 80 - 95 - 110   |
|                         |  | C > 0,25 ... ≤ 0,55 % ricotto                    | 190             | 639                                | P2               | 80 - 115 - 150                            | 80 - 95 - 110   |
|                         |  | C > 0,25 ... ≤ 0,55 % bonificato                 | 210             | 708                                | P3               | 60 - 90 - 120                             | 60 - 75 - 90    |
|                         |  | C > 0,55 % ricotto                               | 190             | 639                                | P4               | 80 - 115 - 150                            | 80 - 95 - 110   |
|                         |  | C > 0,55 % bonificato                            | 300             | 1013                               | P5               | 60 - 90 - 120                             | 60 - 75 - 90    |
|                         |  | Acciaio (truciolo corto) ricotto                 | 220             | 745                                | P6               | 80 - 115 - 150                            | 80 - 95 - 110   |
|                         | Acciai debolmente legati                                   | ricotto  | 175             | 591                                | P7               | 70 - 100 - 130                            | 70 - 85 - 100   |
|                         |  | bonificato                                       | 300             | 1013                               | P8               | 70 - 95 - 120                             | 70 - 80 - 90    |
|                         |  | bonificato                                       | 380             | 1282                               | P9               | 70 - 95 - 120                             | 70 - 80 - 90    |
|                         |  | bonificato                                       | 430             | 1477                               | P10              | 70 - 95 - 115                             | 70 - 80 - 85    |
|                         | Acciai fortemente legati e acciai da utensili              | ricotto  | 200             | 675                                | P11              | 60 - 85 - 110                             | 60 - 70 - 80    |
|                         |  | temprato e rinvenuto                             | 300             | 1013                               | P12              | 50 - 70 - 90                              | 50 - 60 - 70    |
|                         |  | temprato e rinvenuto                             | 400             | 1361                               | P13              | 50 - 70 - 90                              | 50 - 60 - 70    |
|                         | Acciai inossidabili  | ferritico / martensitico, ricotto                | 200             | 675                                | P14              | 50 - 65 - 80                              | 50 - 60 - 70    |
|                         |  | martensitico, bonificato                         | 330             | 1114                               | P15              | 50 - 65 - 80                              | 50 - 60 - 70    |
| M                       | Acciai inossidabili  | austenitico, trattato o temperato                | 200             | 675                                | M1               | 70 - 95 - 120                             | 70 - 80 - 90    |
|                         |  | austenitico, indurimento per precipitazione (PH) | 300             | 1013                               | M2               | 40 - 65 - 90                              | 40 - 55 - 65    |
|                         |  | austenitico-ferritico, Duplex                    | 230             | 778                                | M3               | 10 - 35 - 60                              | 10 - 25 - 40    |
| K                       | Ghisa temprata   | ferritico  | 200             | 675                                | K1               | 70 - 110 - 150                            | 70 - 90 - 110   |
|                         |  | perlitica  | 260             | 867                                | K2               | -   | -               |
|                         | Ghisa grigia   | bassa resistenza                                 | 180             | 602                                | K3               | -   | -               |
|                         |  | alta resistenza / austenitico                    | 245             | 825                                | K4               | 80 - 100 - 120                            | 80 - 90 - 100   |
|                         | Ghisa sferoidale   | ferritico  | 155             | 518                                | K5               | 80 - 90 - 100                             | 80 - 85 - 90    |
|                         |  | perlitica  | 265             | 885                                | K6               | 80 - 90 - 100                             | 80 - 85 - 90    |
| GGV (CGI)               |  | 200  | 675             | K7                                 | 70 - 110 - 150   | 70 - 90 - 110                             |                 |
| N                       | Leghe di Alluminio stampato                                | non invecchiato                                  | 30              | -                                  | N1               | 100 - 170 - 240                           | 100 - 170 - 240 |
|                         |  | rinvenuto, invecchiato                           | 100             | 343                                | N2               | 80 - 125 - 170                            | 80 - 125 - 170  |
|                         | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                       | 75              | 260                                | N3               | -   | -               |
|                         |  | ≤ 12 % Si, rinvenuto, invecchiato                | 90              | 314                                | N4               | -   | -               |
|                         |  | > 12 % Si, non invecchiato                       | 130             | 447                                | N5               | -   | -               |
|                         | Leghe di magnesio  |  | 70              | 250                                | N6               | -   | -               |
|                         | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                   | 100             | 343                                | N7               | 100 - 175 - 250                           | 100 - 175 - 250 |
|                         |  | Ottone, Bronzo                                   | 90              | 314                                | N8               | 80 - 140 - 200                            | 80 - 140 - 200  |
|                         |  | Leghe Cu, truciolo corto                         | 110             | 382                                | N9               | 100 - 175 - 250                           | 100 - 175 - 250 |
|                         |  | Alta resistenza, Ampco                           | 300             | 1013                               | N10              | -   | -               |
| Materiali non metallici | Leghe al piombo (senza materiale di riempimento abrasivo)  | -  | -               | N11                                | -                | -   |                 |
|                         | Duroplastico (senza materiale di riempimento abrasivo)     | -  | -               | N12                                | -                | -   |                 |
|                         | Plastica rinforzata in fibra di vetro GFRP                 | -  | -               | N13                                | -                | -   |                 |
|                         | Plastica rinforzata in fibra di carbonio CFRP              | -  | -               | N14                                | -                | -   |                 |
|                         | Plastica rinforzata in fibra aramidica AFRP                | -  | -               | N15                                | -                | -   |                 |
|                         | Grafite (tecnico)  |  | 80 Shore        | -                                  | N16              | -   | -               |
| S                       | Leghe resistenti al calore                                 | Base-Fe ricotto                                  | 200             | 675                                | S1               | -   | -               |
|                         |  | Base-Fe invecchiato                              | 280             | 943                                | S2               | -   | -               |
|                         |  | Base Ni o Co ricotto                             | 250             | 839                                | S3               | -   | -               |
|                         |  | Base Ni o Co invecchiato                         | 350             | 1177                               | S4               | -   | -               |
|                         |  | Base Ni o Co da fusione                          | 320             | 1076                               | S5               | -   | -               |
|                         | Leghe di Titanio   | Titanio puro                                     | 200             | 675                                | S6               | -   | -               |
|                         |  | Leghe α e β, invecchiato                         | 375             | 1262                               | S7               | -   | -               |
|                         |  | Leghe β  | 410             | 1396                               | S8               | -   | -               |
|                         | Leghe di tungsteno   |  | 300             | 1013                               | S9               | -   | -               |
|                         | Leghe di molibdeno   |  | 300             | 1013                               | S10              | -   | -               |
| H                       | Acciaio Temprato   | temprato e rinvenuto                             | 50 HRC          | -                                  | H1               | -   | -               |
|                         |  | temprato e rinvenuto                             | 55 HRC          | -                                  | H2               | -   | -               |
|                         |  | temprato e rinvenuto                             | 60 HRC          | -                                  | H3               | -   | -               |
|                         | Ghisa Temprata   | temprato e rinvenuto                             | 55 HRC          | -                                  | H4               | -   | -               |

I dati indicati in tabella sono valori approssimati. Può essere necessario adattarli alle singole applicazioni di lavorazione.



| Groupe de matériaux                           | Structure des groupes de matériaux et des lettres de référence |   |        | Dureté Brinell HB | Résistance Rm (N/mm <sup>2</sup> ) | Groupe d'usinage | Vitesse de coupe V <sub>c</sub> (m/min) |             |
|---|--|---|--------|-------------------|------------------------------------|------------------|---|-------------|
|   |  |   |        |                   |                                    |                  | revêtue                                 | non-revêtue |
|   |  |   |        |                   |                                    |                  | AP5020                                  | AK1020      |
| <b>P</b>                                      | Acier non allié  | C ≤ 0,25 % recuit                               | 125    | 428               | P1                                 | 80 - 115 - 150   | 80 - 95 - 110                           |             |
|   |  | C > 0,25 ... ≤ 0,55 % recuit                    | 190    | 639               | P2                                 | 80 - 115 - 150   | 80 - 95 - 110                           |             |
|   |  | C > 0,25 ... ≤ 0,55 % traité                    | 210    | 708               | P3                                 | 60 - 90 - 120    | 60 - 75 - 90                            |             |
|   |  | C > 0,55 % recuit                               | 190    | 639               | P4                                 | 80 - 115 - 150   | 80 - 95 - 110                           |             |
|   |  | C > 0,55 % traité                               | 300    | 1013              | P5                                 | 60 - 90 - 120    | 60 - 75 - 90                            |             |
|   |  | Aciers de décolletage (à copeaux courts) recuit | 220    | 745               | P6                                 | 80 - 115 - 150   | 80 - 95 - 110                           |             |
|   | Acier faiblement allié   | recuit  | 175    | 591               | P7                                 | 70 - 100 - 130   | 70 - 85 - 100                           |             |
|   |  | traité  | 300    | 1013              | P8                                 | 70 - 95 - 120    | 70 - 80 - 90                            |             |
|   |  | traité  | 380    | 1282              | P9                                 | 70 - 95 - 120    | 70 - 80 - 90                            |             |
|   |  | traité  | 430    | 1477              | P10                                | 70 - 95 - 115    | 70 - 80 - 85                            |             |
| Acier allié et acier outil allié              | recuit   | 200   | 675    | P11               | 60 - 85 - 110                      | 60 - 70 - 80     |   |             |
|   | trempe et revenu   | 300   | 1013   | P12               | 50 - 70 - 90                       | 50 - 60 - 70     |   |             |
|   | trempe et revenu   | 400   | 1361   | P13               | 50 - 70 - 90                       | 50 - 60 - 70     |   |             |
| Acier inox                                    | ferritique, martensitique, recuit                              | 200   | 675    | P14               | 50 - 65 - 80                       | 50 - 60 - 70     |   |             |
|   | martensitique, traité  | 330   | 1114   | P15               | 50 - 65 - 80                       | 50 - 60 - 70     |   |             |
| <b>M</b>                                      | Acier inox   | austénitique                                    | 200    | 675               | M1                                 | 70 - 95 - 120    | 70 - 80 - 90                            |             |
|   |  | austénitique                                    | 300    | 1013              | M2                                 | 40 - 65 - 90     | 40 - 55 - 65                            |             |
|   |  | austénitique-ferritique, Duplex                 | 230    | 778               | M3                                 | 10 - 35 - 60     | 10 - 25 - 40                            |             |
| <b>K</b>                                      | Fonte malléable  | ferritique                                      | 200    | 675               | K1                                 | 70 - 110 - 150   | 70 - 90 - 110                           |             |
|   |  | perlitique                                      | 260    | 867               | K2                                 | -                | -                                       |             |
|   | Fonte grise  | faible résistance                               | 180    | 602               | K3                                 | -                | -                                       |             |
|   |  | haute résistance / austénitique                 | 245    | 825               | K4                                 | 80 - 100 - 120   | 80 - 90 - 100                           |             |
|   | Fonte à Graphite sphéroïdale                                   | ferritique                                      | 155    | 518               | K5                                 | 80 - 90 - 100    | 80 - 85 - 90                            |             |
|   |  | perlitique                                      | 265    | 885               | K6                                 | 80 - 90 - 100    | 80 - 85 - 90                            |             |
| GGV (CGI)                                     |  | 200   | 675    | K7                | 70 - 110 - 150                     | 70 - 90 - 110    |   |             |
| <b>N</b>                                      | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement            | 30     | -                 | N1                                 | 100 - 170 - 240  | 100 - 170 - 240                         |             |
|   |  | pouvant subir un durcissement, durci            | 100    | 343               | N2                                 | 80 - 125 - 170   | 80 - 125 - 170                          |             |
|   | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement | 75     | 260               | N3                                 | -                | -                                       |             |
|   |  | ≤ 12 % Si, pouvant subir un durcissement, durci | 90     | 314               | N4                                 | -                | -                                       |             |
|   |  | > 12 % Si, ne pouvant pas subir de durcissement | 130    | 447               | N5                                 | -                | -                                       |             |
| Alliage de Magnésium                          |  | 70  | 250    | N6                | -                                  | -                |   |             |
| Cuivre et alliage de cuivre (bronze / laiton) | non allié, cuivre électrolytique                               | 100   | 343    | N7                | 100 - 175 - 250                    | 100 - 175 - 250  |   |             |
|   | Laiton, bronze, fonte rouge                                    | 90  | 314    | N8                | 80 - 140 - 200                     | 80 - 140 - 200   |   |             |
|   | Alliage de cuivre à copeaux courts                             | 110   | 382    | N9                | 100 - 175 - 250                    | 100 - 175 - 250  |   |             |
|   | forte résistance, Ampco  | 300   | 1013   | N10               | -                                  | -                |   |             |
| Matériaux non métalliques                     | Thermoplaste (sans agents de charge abrasives)                 | -   | -      | N11               | -                                  | -                |   |             |
|   | Duroplaste (sans agents de charge abrasives)                   | -   | -      | N12               | -                                  | -                |   |             |
|   | Matière plastique renforcée de fibres de verre GFRP            | -   | -      | N13               | -                                  | -                |   |             |
|   | Matière plastique renforcé composite CFRP                      | -   | -      | N14               | -                                  | -                |   |             |
|   | Plastique renforcé fibre aramide AFRP                          | -   | -      | N15               | -                                  | -                |   |             |
|   | Graphite   | 80 Shore  | -      | N16               | -                                  | -                |   |             |
| <b>S</b>                                      | Alliages réfractaires  | à base de Fe recuit                             | 200    | 675               | S1                                 | -                | -                                       |             |
|   |  | à base de Fe durci                              | 280    | 943               | S2                                 | -                | -                                       |             |
|   |  | à base Ni ou Co recuit                          | 250    | 839               | S3                                 | -                | -                                       |             |
|   |  | à base Ni ou Co durci                           | 350    | 1177              | S4                                 | -                | -                                       |             |
|   |  | à base Ni ou Co jeter                           | 320    | 1076              | S5                                 | -                | -                                       |             |
|   | Alliage de titane  | Titane pur                                      | 200    | 675               | S6                                 | -                | -                                       |             |
|   |  | Alliages Alpha + Beta, trempé                   | 375    | 1262              | S7                                 | -                | -                                       |             |
|   |  | Alliages Beta                                   | 410    | 1396              | S8                                 | -                | -                                       |             |
|   | Alliage de tungstène   |   | 300    | 1013              | S9                                 | -                | -                                       |             |
|   | Alliage de molybdène   |   | 300    | 1013              | S10                                | -                | -                                       |             |
| <b>H</b>                                      | Acier trempé   | trempe et revenu                                | 50 HRC | -                 | H1                                 | -                | -                                       |             |
|   |  | trempe et revenu                                | 55 HRC | -                 | H2                                 | -                | -                                       |             |
|   |  | trempe et revenu                                | 60 HRC | -                 | H3                                 | -                | -                                       |             |
|   | Fonte durci  | trempe et revenu                                | 55 HRC | -                 | H4                                 | -                | -                                       |             |

Les valeurs annoncées dans les tableaux sont des valeurs indicatives. Il peut s'avérer nécessaire d'adapter ces valeurs à chaque opération d'usinage.



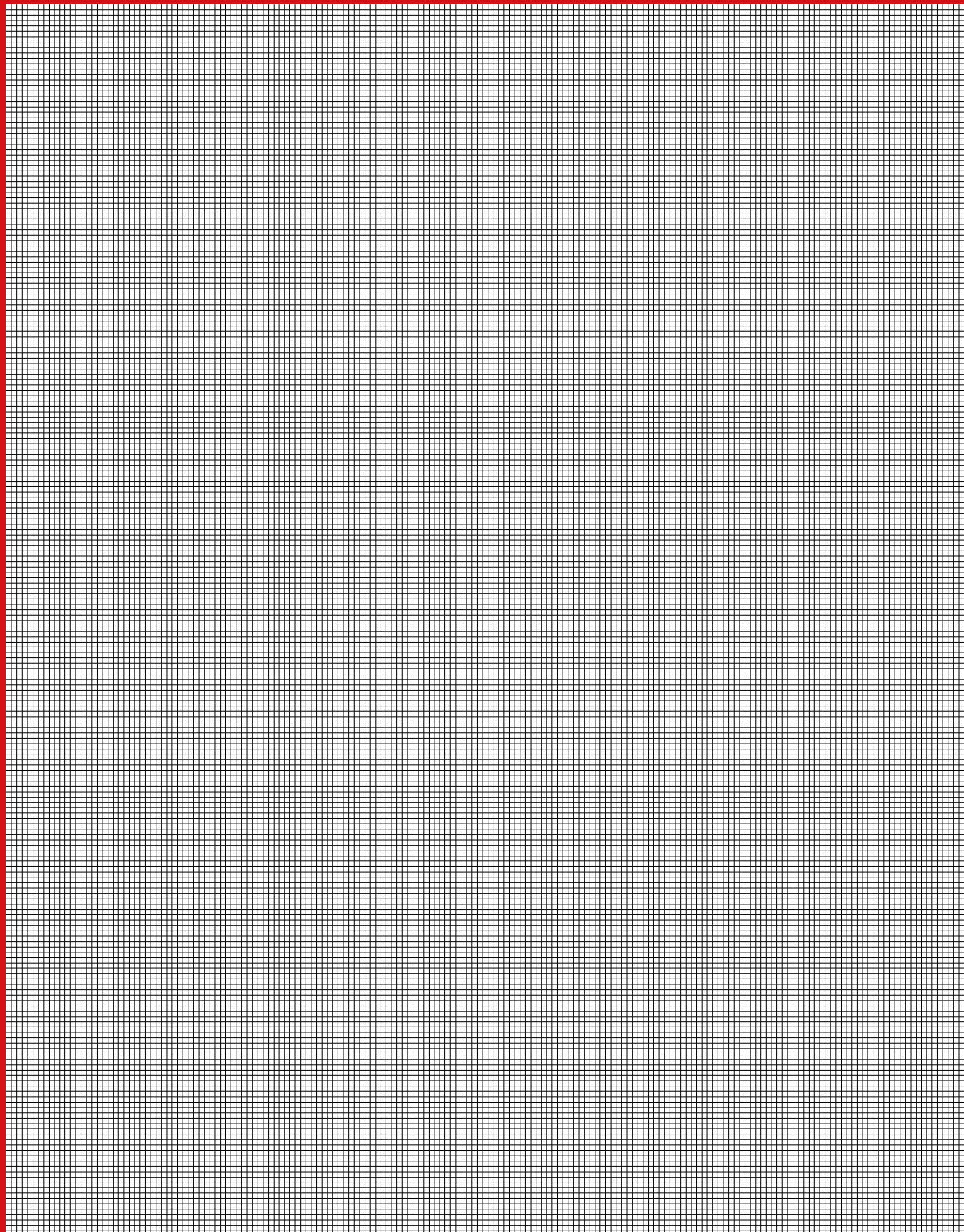
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# STANDARD CUTTING DATA FOR THREAD TURNING – NUMBER OF PASSES

## PARAMETRI DI TAGLIO SUGGERITI - NUMERO DELLE PASSATE

### VALEURS DE COUPE RECOMMANDÉES FILETAGE – NOMBRE DE PASSAGES

| Pitch<br>Passo<br>Hélice |  | Number of cuts<br>Numero dei tagli<br>Nombre de coupes   |           |         |   |                                   |                                     |
|--------------------------|--|--|-----------|---------|---|-----------------------------------|-------------------------------------|
| (mm)                     | Pass/inch<br>Filettatura/pollice<br>Filets/pouce | Steel toughness [N/mm <sup>2</sup> ]<br>Resistenza acciaio [N/mm <sup>2</sup> ]<br>Résistance acier [N/mm <sup>2</sup> ] |           |         | Stainless<br>Inossidabile<br>Acier inoxydable | Cast metal<br>Pezzi fusi<br>Fonte | Aluminium<br>Alluminio<br>Aluminium |
|                          |  | 400–700  | 700–1,000 | > 1,000 |   |                                   |                                     |
| 0.8                      | 32   | 8  | 9         | 10      | 10  | 9                                 | 8                                   |
| 1                        | 24   | 10   | 11        | 12      | 12  | 12                                | 10                                  |
| 1.25                     | 20–19  | 12   | 14        | 15      | 15  | 14                                | 12                                  |
| 1.5                      | 16   | 15   | 17        | 18      | 18  | 17                                | 15                                  |
| 1.75                     | 14   | 17   | 19        | 21      | 21  | 18                                | 17                                  |
| 2                        | 12   | 19   | 22        | 25      | 25  | 20                                | 18                                  |
| 2.5                      | 10   | 22   | 26        | 31      | 31  | 22                                | 20                                  |
| 3.0–3.5                  | 8  | 28   | 32        | 38      | 38  | 24                                | 22                                  |

The values listed here are general recommendations for the number of passes for machining normal steel and non-ferrous metal materials. With hard materials, the cutting depth should be reduced and the number of cuts increased.

If the insert ruptures, increase the number of passes. If the insert is subject to high wear, reduce the number of passes.

NOTE: The chip cross-section should be of identical size for each pass. This means that, as cutting depth increases, reduce the feed rate to maintain constant cutting forces.

I valori qui indicati sono raccomandazioni generali per il numero delle passate durante la lavorazione di normali materiali in acciaio o metalli non ferrosi. Per i materiali duri si deve ridurre la profondità di taglio e aumentare il numero dei tagli.

In caso di rottura dell'inserto il numero dei passaggi va aumentato, in presenza di usura elevata va ridotto.

NOTA: La sezione dei trucioli dovrebbe avere la stessa dimensione ad ogni passata, ciò significa che con l'aumentare della profondità del taglio si deve ridurre l'avanzamento per ottenere forze di taglio costanti.

Les valeurs indiquées ici sont des recommandations générales pour le nombre de passages pour l'usinage de matériaux en acier et non ferreux normaux. Pour les matériaux durs, il convient de réduire la profondeur de coupe et d'augmenter le nombre de coupes.

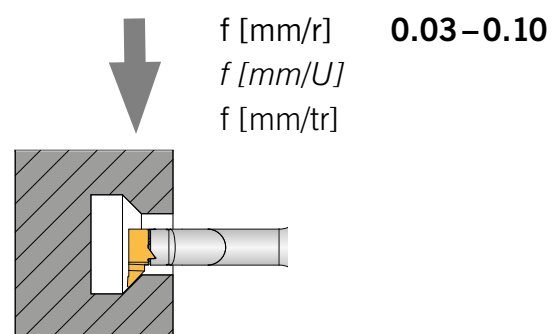
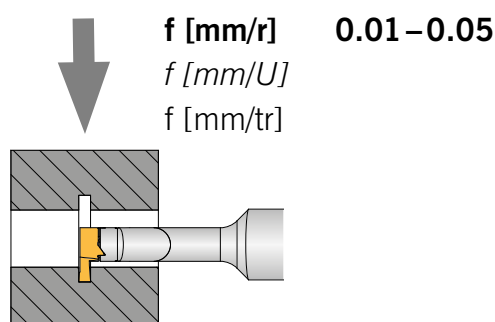
En cas de rupture de plaquette, le nombre de passages doit être augmenté. Il doit être réduit en cas de forte usure.

REMARQUE : la section de copeaux doit être de la même taille à chaque passage, c'est-à-dire que la disposition doit être réduite à profondeur de coupe croissante afin d'obtenir des pressions de coupe constantes.

## SIM – BORING BARS – FEED RATE RANGES

### SIM – BARENI – CAMPO DI AVANZAMENTO

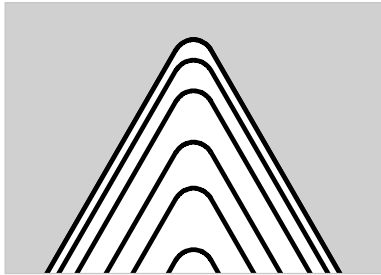
### SIM – BARRES D'ALÉSAGE – PLAGES D'AVANCE



# THREAD TURNING – THE THREE MOST COMMON FEED RATE TYPES

## FILETTATURA – I TRE TIPI DI AVANZAMENTO PIÙ COMUNI

### FILETAGE – LES TROIS TYPES DE DISPOSITION LES PLUS COURANTS



#### Radial infeed

The simplest and most common feed type perpendicular to the rotation axis. Machining takes place on both tool flanks, ensuring uniform wear. Recommended for pitches up to approx. 2 mm. Mainly used for short chipping materials, for steels with a tendency to work hardening and stainless steels.

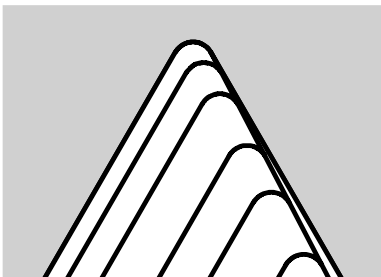
#### Avanzamento radiale

Avanzamento semplice e più usato, verticale rispetto all'asse di rotazione. La lavorazione avviene su entrambi i fianchi, in questo modo si garantisce un'usura

equilibrata. Consigliato per piccoli passi fino a ca. 2 mm. Preferito per materiali a truciolo corto e per acciai tendenti all'incrudimento o per acciai inossidabili.

#### Disposition radiale

Disposition simple et la plus courante perpendiculaire à l'axe de rotation. L'usinage se fait sur les deux flancs des dents, garantissant ainsi une usure uniforme. Recommandée pour les petites hélices jusqu'à env. 2 mm. Privilégiée pour les matériaux à copeaux courts et pour les aciers enclins à l'écrouissage et inoxydables.



#### Flank infeed

Infeed at an angle of 3°–5° to the thread flank. Mainly used for NC machines. Good chip control, so specially suited to internal threads and long chipping materials. For pitches over 2 mm.

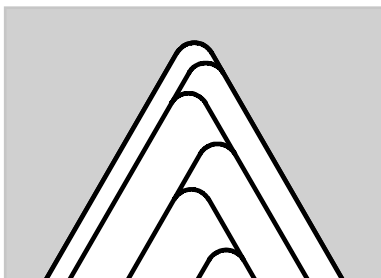
#### Avanzamento sul fianco

Avanzamento inferiore ad un angolo di 3°–5° gradi rispetto al fianco della filettatura.

Preferito per le macchine a CN. Buon controllo del truciolo, quindi particolarmente adatto per filettatura interna e materiali a truciolo lungo. Per passi maggiori, a partire da 2 mm.

#### Disposition modifiée du flanc

Disposition sous un angle de 3 à 5° par rapport au flanc du filetage. Privilégié pour les machines NC. Bon contrôle des copeaux, par conséquent, convient particulièrement pour les filetages intérieurs et les matériaux à copeaux longs. Pour les hélices plus grandes à partir de 2 mm.



#### Alternating flank infeed

Alternating infeed along both flanks. Long tool life due to uniform flank wear on both cutting edges. Especially for large pitches greater than 4 mm on NC machines with special programming.

#### Avanzamento alternato

Avanzamento alternato lungo entrambi i fianchi. Durate elevate grazie all'usura

equilibrata dei fianchi su entrambi i taglienti. Soprattutto per passi grandi, a partire da 4 mm, su macchine a CN con programmazione speciale.

#### Disposition alternante

Disposition alternante le long des deux flancs. Longue durée de vie grâce à une usure uniforme des flancs sur les deux bords tranchants. Convient particulièrement pour les grandes hélices à partir de 4 mm sur des machines NC à programmation spéciale.

## CALCULATING THE PITCH ANGLE $\beta$

### CALCOLO DELL'ANGOLO DELL'ELICA $\beta$

### CALCUL DE L'ANGLE D'HÉLICE $\beta$

$$\beta = \frac{P \text{ [mm]}}{D \text{ [mm]}} \times 18.23$$

With example of internal thread M10, pitch 1.5 mm:

Esempio filettatura interna M10, passo 1,5 mm:

Exemple d'un filetage intérieur M10, hélice 1,5 mm :

$$\beta = \frac{1.5 \text{ mm}}{9.03 \text{ mm}} \times 18.23 = 3.03^\circ$$

$\beta$  = pitch angle (degrees) / Angolo dell'elica (gradi) / angle d'hélice (degré)

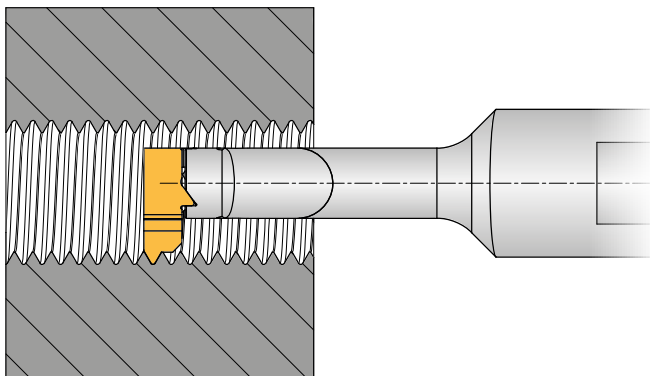
P = pitch (mm) / passo (mm) / pas (mm)

D = flank diameter (mm) / Diametro medio (mm) / diamètre du flanc (mm)

## ARNO INTERNAL THREAD

### ISO – FILETTATURA INTERNA

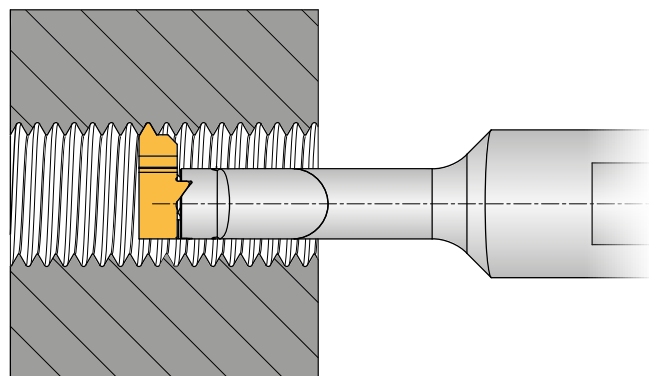
### ISO – FILETAGE INTÉRIEUR



#### HOLDERS and inserts in right-hand execution

Supporti e inserti in versione destra

Supports et inserts de coupe à droite



#### HOLDERS and inserts in left-hand execution

Supporti e inserti in versione sinistra

Supports et inserts de coupe à gauche

# ASSEMBLY INSTRUCTION

## AVVERTENZE PER IL MONTAGGIO

### INSTRUCTIONS DE MONTAGE

#### Left-hand boring bar Left-hand insert

*Bareno sinistro  
Inserto sinistro*  
Barre d'alésage gauche  
Insert de coupe gauche



#### Right-hand boring bar Right-hand insert

*Bareno destro  
Inserto destro*  
Barre d'alésage droite  
Insert de coupe droit

**The 3-point location ensures exact repeatability of the cutting head position in relation to the tip height. Nonetheless, attention must always be paid to tip height since deviations may cause problems especially when very small diameters are machined.**

*L'appoggio a 3 punti garantisce una precisione esatta di posizionamento dell'inserto rispetto all'altezza delle punte. Tuttavia è sempre necessario prestare attenzione all'altezza delle punte poiché scostamenti possono creare problemi durante la lavorazione di diametri estremamente piccoli.*

Le support à 3 points garantit une précision de répétition exacte du positionnement de la tête de coupe par rapport à la hauteur de pointe. Cependant, il convient de toujours prêter attention à la hauteur de pointe, car des écarts peuvent poser problèmes, notamment lors de l'usinage de petits diamètres.

#### TIPS:

- Choose narrow cutting edges so that the chip remains smooth and can flow past the tool out of the hole.
- To prevent chip accumulation, it is advisable to groove in steps or with interrupted cuts.
- Recommended coolant pressure = 5 bar.
- When the cutting head is changed, always clean the interface with compressed air.

#### CONSIGLI:

- Selezionare taglienti stretti, in modo che il truciolo rimanga flessibile e possa passare tra il foro sull'utensile.
- Per evitare l'intasamento dei trucioli si consiglia di effettuare la scanalatura a gradini o con interruzione del taglio.
- Pressione consigliata del refrigerante = 5 bar.
- Al momento del cambio dell'inserto pulire l'interfaccia con aria compressa.

#### CONSEILS :

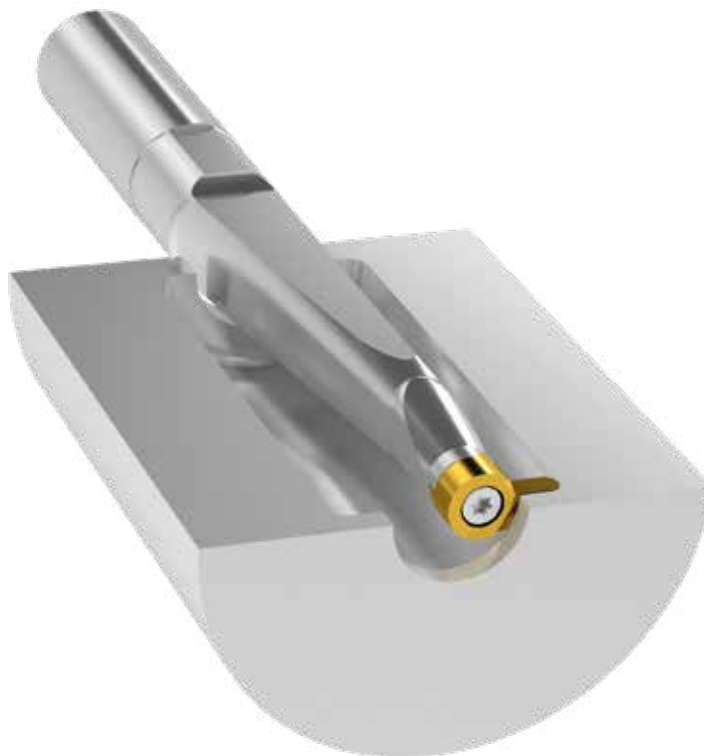
- Choisissez des bords tranchants minces pour que le copeau reste souple et puisse passer de l'alésage à l'outil.
- Pour éviter un bourrage de copeaux, il est recommandé d'usiner les gorges par paliers ou par coupe interrompue.
- Pression de liquide de refroidissement recommandée = 5 bar.
- Lors du changement de tête de coupe, nettoyez l'interface à l'air comprimé.

## **PRACTICAL EXAMPLES** *ESEMPI PRATICI* **EXEMPLES CONCRETS**

**Special holder:  
Special design.**

*Utensile speciale:  
Applicazione specifica.*

Support spécial :  
Modèle spécial.



**Special insert: CBN brazed.  
Special for hard turning.**

*Inserto speciale: riporto CBN*  
*Specifico per la tornitura di*  
*materiale duro.*

Insert de coupe spécial : Doté  
de CBN. Spécialement conçu  
pour tournage dur



## SHARK-Cut®

|                             |                                       |                                 |           |
|-----------------------------|---------------------------------------|---------------------------------|-----------|
| • System presentation       | • <i>Presentazione del sistema</i>    | • Présentation du système       | 586 – 589 |
| • Designation system        | • <i>Sistema di identificazione</i>   | • Système de désignation        | 590       |
| • Tool selection            | • <i>Scelta di utensili</i>           | • Choix d'outils                | 591       |
| • SHARK-Cut® Mini           | • <i>SHARK-Cut® Mini</i>              | • SHARK-Cut® Mini               | 592 – 594 |
| • SHARK-Cut® Standard       | • <i>SHARK-Cut® Standard</i>          | • SHARK-Cut® Standard           | 595 – 597 |
| • SHARK-Cut® Rebore         | • <i>SHARK-Cut® Rebore</i>            | • SHARK-Cut® Rebore             | 598 – 600 |
| • Description of geometries | • <i>Descrizioni geometrie</i>        | • Descriptions des géométries   | 601 – 602 |
| • Description of grades     | • <i>Descrizioni qualità</i>          | • Descriptions des nuances      | 603 – 607 |
| • Indexable inserts         | • <i>Inseriti</i>                     | • Plaquettes de coupe amovibles | 608 – 609 |
| • Recommended cutting data  | • <i>Valori di taglio consigliati</i> | • Valeurs de coupe recommandées | 610 – 619 |
| • Application notes         | • <i>Suggerimenti tecnici</i>         | • Consignes d'utilisation       | 620 – 627 |



# 8

# MULTI PURPOSE. ULTRA PROFITABLE MULTIFUNZIONALE. MEGAVANTAGGIOSO MULTIFONCTION RENTABILITÉ MAXIMALE

## Turning and drilling with only one tool: SHARK-CUT.

Do you want to save space and money, manufacture fast and set up less? No problem with SHARK-CUT. This multi purpose tool lets you carry out turning and boring operations without changing tool. You need fewer tool positions on the machine and you save space in the store. You reduce programming work and presetting time. And you also achieve a flat bottom face and high surface finish quality.

You are equipped for every requirement with three variants: SHARK-CUT Mini with inserts made of solid carbide starts at 4 mm; SHARK-CUT Standard with indexable inserts in various geometries starting at diameter of 8 mm, and SHARK-CUT Rebores with two or three flutes and a variety of indexable insert geometries starting at diameters of 12 mm (2-fluted) or 24 mm (3-fluted).

## Tornitura e foratura con un unico utensile: SHARK-CUT.

Desidera risparmiare spazio e denaro, produrre più velocemente e impiegare meno tempo nella lavorazione? Nessun problema con SHARK-CUT. Con l'utensile multifunzione è possibile eseguire operazioni di tornitura e foratura senza doverlo cambiare. Così avrà bisogno di meno posti per gli utensili in macchina e potrà risparmiare spazio nel magazzino. In questo modo si riducono le spese per la programmazione e i tempi di attrezzaggio. Inoltre si ottiene un fondo di foratura piano e una elevata qualità della finitura.

Con le tre varianti Lei sarà attrezzato per affrontare ogni esigenza: SHARK-CUT Mini con inserti in metallo duro a partire da 4 mm, SHARK-CUT Standard con inserti in diverse geometrie a partire da 8 mm di diametro e SHARK-CUT Rebores a due o tre taglienti con inserti a diverse geometrie, a partire dal diametro 12 mm o 24 mm.

## Tournage et perçage avec un seul outil : SHARK-CUT.

Vous voulez gagner de l'espace et du temps, fabriquer plus vite et passer moins de temps à préparer ? Aucun problème avec le SHARK-CUT. Cet outil multifonction vous permet d'effectuer des opérations de tournage et de perçage sans devoir changer d'outil. Vous n'avez plus besoin d'autant d'emplacements pour les outils sur la machine et vous économisez de l'espace dans le magasin. Les efforts de programmation et les temps de pré réglage sont considérablement réduits. Et vous obtenez en plus un perçage plan et une qualité de finition élevée.

Avec trois variantes, vous êtes paré pour faire face à chaque situation : le système SHARK-CUT Mini avec inserts de coupe en carbure monobloc est disponible à partir de 4 mm de diamètre. Le système SHARK-CUT Standard avec plaquettes de coupe amovibles dans différentes géométries est disponible à partir de 8 mm de diamètre et le système SHARK-CUT Rebores à deux ou trois tranchants et plaquettes de coupe amovibles dans différentes géométries est disponible à partir de 12 mm ou 24 mm de diamètre.







### 3 varianti per ogni diametro

- SHARK-CUT Mini – Insetto in metallo duro:  $\phi$  da 4 a 8 mm, 2,25 x D e 4 x D
- SHARK-CUT Standard – Utensile per inserti: da  $\phi$  8 a 32 mm, 1,5 x D, 2,25 x D e 3 x D
- SHARK-CUT Rebore – Utensile per inserti: a due taglienti, a partire da  $\phi$  12 mm oppure a tre taglienti a partire da  $\phi$  24 mm, entrambi 2,25 x D



### Inserti da taglio e inserti intercambiabili

- Inserti in metallo duro integrale: rivestiti e non rivestiti
- Inserti in 3 geometrie e 12 qualità: rivestiti e non rivestiti, rettificati lungo il profilo e lappati o sinterizzati, sostituzione semplice con una vite



### 3 variants for every diameter

- SHARK-CUT Mini – tool holder for solid carbide inserts:  $\phi$  4 to 8 mm, 2.25 x D and 4 x D
- SHARK-CUT Standard – tool holder for indexable inserts:  $\phi$  8 to 32 mm, 1.5 x D, 2.25 x D and 3 x D
- SHARK-CUT Rebore – tool holder for indexable inserts: 2 flutes starting at  $\phi$  12 mm or 3 flutes starting at  $\phi$  24 mm, 2.25 x D in each case

### 3 variantes pour un diamètre

- SHARK-CUT Mini : porte-outils pour inserts de coupe en carbure monobloc :  $\phi$  4 jusqu'à 8 mm, 2,25 x D et 4 x D
- SHARK-CUT Standard – porte-outils pour plaquettes de coupe amovibles :  $\phi$  8 jusqu'à 32 mm, 1,5 x D, 2,25 x D et 3 x D
- SHARK-CUT Rebore – porte-outils pour plaquettes de coupe amovibles : à deux tranchants à partir de  $\phi$  12 mm ou à trois tranchants à partir de  $\phi$  24 mm, chacun 2,25 x D

### Inserts and indexable inserts

- Solid carbide execution: coated and uncoated
- Indexable inserts in 3 geometries and 12 grades: coated and uncoated, periphery ground and polished or sintered, simple tool change with only one screw

### Inserts en carbure monobloc et plaquettes amovibles

- Inserts de coupe en carbure monobloc : avec et sans revêtement
- Plaquettes de coupe amovibles en 3 géométries et 12 nuances : avec et sans revêtement, rectifiées et polies ou frittées, changement simple avec une vis

### Multi purpose

- Drilling into solid with flat bottom face
- Facing operations
- Turning internal profiles
- Turning external profiles

### Multifunzione

- Foratura in solido con fondo di foratura piano
- Tornitura di profilo in piano
- Tornitura di profili interni
- Tornitura di profili esterni

### Multifonction

- Percage dans le plein à fond plat
- Tournage de contours plans
- Tournage de contours intérieurs
- Tournage de contours extérieurs



## System presentation

Presentazione del sistema

Présentation du système

# ARNO SHARK-CUT® MULTI PURPOSE TOOL

## UTENSILE MULTIFUNZIONE ARNO SHARK-CUT®

## OUTIL MULTIFONCTION ARNO SHARK-CUT®

### SHARK-CUT® Mini:

**TURNING and DRILLING  $\geq \text{Ø } 4 \text{ mm}$**

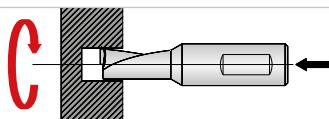
**Solid carbide tool**

*TORNITURA e FORATURA  $\geq \text{Ø } 4 \text{ mm}$*

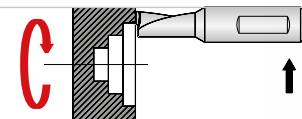
*Utensile in metallo duro*

*TOURNAGE et ALÉSAGE  $\geq \text{Ø } 4 \text{ mm}$*

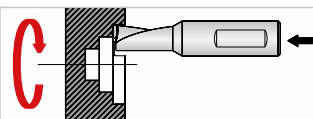
*Outil en carbure monobloc*



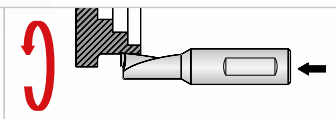
**Drilling into solid with flat bottom face**  
*Foratura in solido con fondo di foratura piano*  
*Forage dans le plein à fond plat*



**Facing operations**  
*Foratura di profili in piano*  
*Tournage de contours plans*



**Turning internal profiles**  
*Tornitura interna*  
*Tournage de contours intérieurs*



**Turning external profiles**  
*Tornitura di profili esterni*  
*Tournage de contours extérieurs*

## SHARK-CUT® Standard:

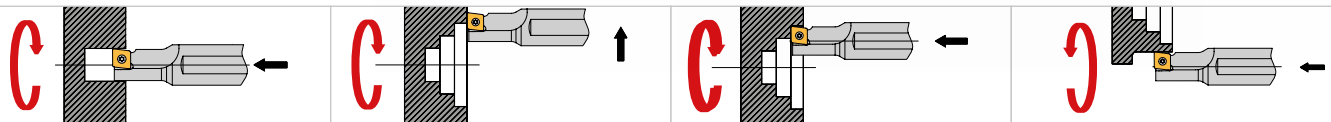
**TURNING and DRILLING  $\geq \varnothing 8 \text{ mm}$**   
**TORNITURA e FORATURA  $\geq \varnothing 8 \text{ mm}$**   
**TOURNAGE et PERÇAGE  $\geq \varnothing 8 \text{ mm}$**



1.5xD

2.25xD

3xD



**Drilling into solid with flat bottom face**  
*Foratura in solido con fondo di foratura piano*  
 Perçage avec fond plat

**Facing operations**  
*Foratura di profili in piano*  
 Dressage de face

**Turning internal profiles**  
*Tornitura di profili interni*  
 Tournage intérieur

**Turning external profiles**  
*Tornitura di profili esterni*  
 Tournage extérieur

## SHARK-CUT® Rebore:

**2-fluted  $\geq \varnothing 12 \text{ mm}$**   
**a 2 taglienti  $\geq \varnothing 12 \text{ mm}$**   
**à 2 goujures  $\geq \varnothing 12 \text{ mm}$**

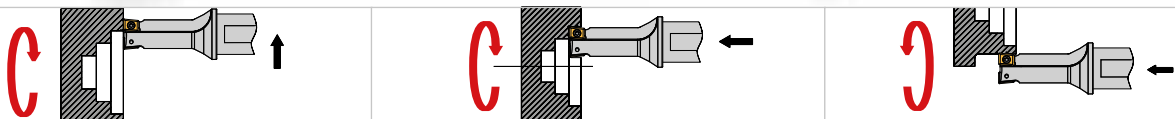


2.25xD

**3-fluted  $\geq \varnothing 24 \text{ mm}$**   
**a 3 taglienti  $\geq \varnothing 24 \text{ mm}$**   
**à 3 goujures  $\geq \varnothing 24 \text{ mm}$**



2.25xD



**Facing operations**  
*Foratura di profili in piano*  
 Dressage de face

**Turning internal profiles**  
*Tornitura interna*  
 Tournage intérieur

**Turning external profiles**  
*Tornitura di profili esterni*  
 Tournage extérieur

## SHARK-CUT® Mini

|            |                   |                        |                 |                     |            |             |
|------------|-------------------|------------------------|-----------------|---------------------|------------|-------------|
| <b>SC</b>  | <b>04</b>         | <b>R/L</b>             | <b>016</b>      | <b>SP</b>           | <b>ALU</b> | <b>AK10</b> |
| SHARK-CUT® | Nominal diameter  | Right-hand / Left-hand | Max. depth      | Spiral flute        | Geometry   | Grade       |
| SHARK-CUT® | Diametro nominale | Destra / Sinistra      | Lunghezza utile | Scarico elicoidale  | Geometria  | Qualità     |
| SHARK-CUT® | Diamètre nominal  | Droite / Gauche        | Longueur utile  | Goujure hélicoïdale | Géométrie  | Nuance      |

## SHARK-CUT® Standard

|            |                   |                        |                 |                     |  |
|------------|-------------------|------------------------|-----------------|---------------------|--|
| <b>SC</b>  | <b>16</b>         | <b>R/L</b>             | <b>0036</b>     | <b>SP</b>           | <b>08</b>                              |
| SHARK-CUT® | Nominal diameter  | Right-hand / Left-hand | Max. depth      | Spiral flute        | Insert size                            |
|            | Diametro nominale | Destra / Sinistra      | Lunghezza utile | Scarico elicoidale  | Misura inserto                         |
|            | Diamètre nominal  | Droite / Gauche        | Longueur utile  | Goujure hélicoïdale | Dimensions plaquette de coupe amovible |

## SHARK-CUT® Rebore

|            |                   |                  |                    |                      |                 |                 |  |
|------------|-------------------|------------------|--------------------|----------------------|-----------------|-----------------|--|
| <b>SC</b>  | <b>24</b>         | <b>12</b>        | <b>R</b>           | <b>03</b>            | <b>0054</b>     | <b>G</b>        | <b>06</b>                              |
| SHARK-CUT® | Nominal diameter  | D <sub>min</sub> | Right-hand cutting | Number of flutes     | Max. depth      | Straight flute  | Insert size                            |
|            | Diametro nominale |                  | con taglio destro  | Numero dei taglienti | Lunghezza utile | Scarico diritto | Misura inserto                         |
|            | Diamètre nominal  |                  | Coupe à droite     | Nombre de dents      | Longueur utile  | Goujure droite  | Dimensions plaquette de coupe amovible |

## SHARK-CUT® Indexable inserts

|   |            |             |
|---|------------|-------------|
| <b>LPET 080304FN</b>  | <b>AWI</b> | <b>AL10</b> |
| Indexable insert nomenclature acc. To ISO standard                  | Geometry   | Grade       |
| Denominazione inserto secondo norma ISO                             | Geometria  | Qualità     |
| Désignation plaquette de coupe amovible conformément à la norme ISO | Géométrie  | Nuance      |

**SHARK-CUT® Mini**



**2.25 x D**  
**4 x D**

**Ø 4.0 – 8.0 mm**

**592 – 593**

**SHARK-CUT® Standard**



**1.5 x D**  
**2.25 x D**  
**3 x D**

**Ø 8.0 – 32.0 mm**  
**Ø 8.0 – 32.0 mm**  
**Ø 8.0 – 32.0 mm**  
**Densimet**

**595**  
**596**  
**597**

**SHARK-CUT® Rebore**



**2-fluted / a 2 taglienti / à 2 tranchants**  
**2.25 x D**      **Ø 12.0 – 50.0 mm**  
**3-fluted / a 3 taglienti / à 3 tranchant**  
**2.25 x D**      **Ø 24.0 – 50.0 mm**

**598**  
**600**

**SHARK-CUT® Indexable inserts**

*SHARK-CUT® Inserti*

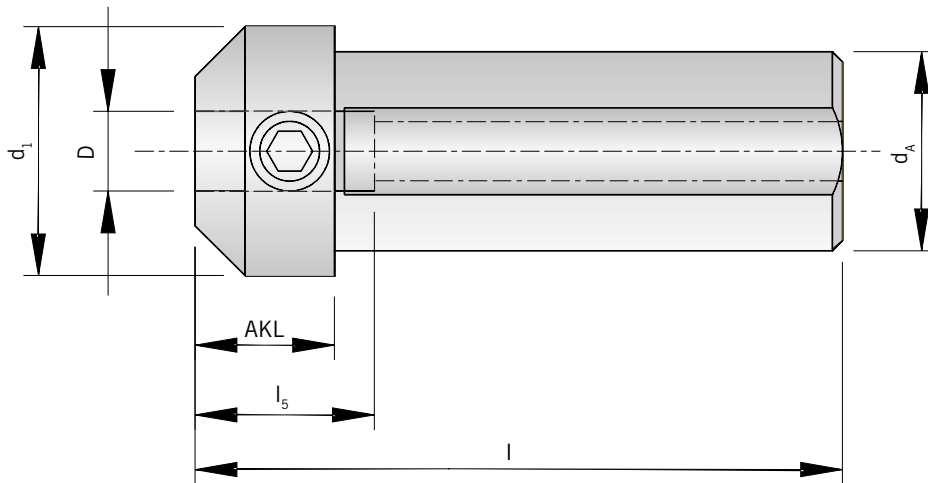
*Plaquettes de coupe amovibles SHARK-CUT®*



**LPET**  
**LPNT**

**608**  
**609**

## 2,25 x D / 4 x D



### Holders / Adattatore / Porte-outils

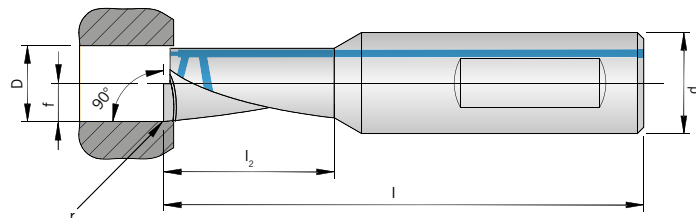
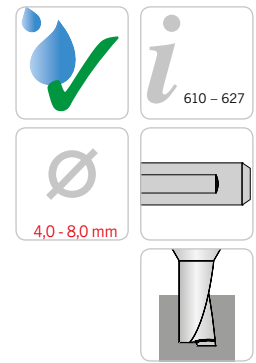
| Designation<br>Articolo<br>Article | D | d <sub>1</sub> | l  | AKL | l <sub>5</sub> | d <sub>a</sub> | Insert<br>Inserto<br>Insert         |
|------------------------------------|---|----------------|----|-----|----------------|----------------|-------------------------------------|
| SC AD20-06                         | 6 | 25             | 65 | 14  | 18             | 20,00          | SC04...SP../SC05...SP..             |
| SC AD20-08                         | 8 | 25             | 65 | 14  | 18             | 20,00          | SC06...SP../SC07...SP../SC08...SP.. |
| SC AD3/4"-08                       | 8 | 25             | 65 | 14  | 18             | 19,05          | SC06...SP../SC07...SP../SC08...SP.. |

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Adattatore<br>Porte-outils | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage |
|--------------------------------------|--|
| SC AD3/4"-08                         | 7897990  |
| SC AD20-06                           | 7897990  |
| SC AD20-08                           | 7897990  |

**Solid carbide cutter / Utensile in Metallo Duro /**  
Insert de coupe en carbure monobloc

2,25 x D / 4 x D



| Designation<br>Articolo<br>Article | D | l  | l <sub>2</sub> | d <sub>A</sub> | f   | r   | HC    | HU   |
|------------------------------------|---|----|----------------|----------------|-----|-----|-------|------|
|                                    |   |    |                |                |     |     | AL350 | AK10 |
| SC04L-009SP                        | 4 | 35 | 9,00           | 6              | 2,0 | 0,2 | ◆     |      |
| SC04L-009SP-ALU                    | 4 | 35 | 9,00           | 6              | 2,0 | 0,2 |       | ◆    |
| SC04L-016SP                        | 4 | 41 | 16,00          | 6              | 2,0 | 0,2 | ◆     |      |
| SC04L-016SP-ALU                    | 4 | 41 | 16,00          | 6              | 2,0 | 0,2 |       | ◆    |
| SC04R-009SP                        | 4 | 35 | 9,00           | 6              | 2,0 | 0,2 | ◆     |      |
| SC04R-009SP-ALU                    | 4 | 35 | 9,00           | 6              | 2,0 | 0,2 |       | ◆    |
| SC04R-016SP                        | 4 | 41 | 16,00          | 6              | 2,0 | 0,2 | ◆     |      |
| SC04R-016SP-ALU                    | 4 | 41 | 16,00          | 6              | 2,0 | 0,2 |       | ◆    |
| SC05L-011SP                        | 5 | 37 | 11,25          | 6              | 2,5 | 0,2 | ◆     |      |
| SC05L-011SP-ALU                    | 5 | 37 | 11,25          | 6              | 2,5 | 0,2 |       | ◆    |
| SC05L-020SP                        | 5 | 45 | 20,00          | 6              | 2,5 | 0,2 | ◆     |      |
| SC05L-020SP-ALU                    | 5 | 45 | 20,00          | 6              | 2,5 | 0,2 |       | ◆    |
| SC05R-011SP                        | 5 | 37 | 11,25          | 6              | 2,5 | 0,2 | ◆     |      |
| SC05R-011SP-ALU                    | 5 | 37 | 11,25          | 6              | 2,5 | 0,2 |       | ◆    |
| SC05R-020SP                        | 5 | 45 | 20,00          | 6              | 2,5 | 0,2 | ◆     |      |
| SC05R-020SP-ALU                    | 5 | 45 | 20,00          | 6              | 2,5 | 0,2 |       | ◆    |
| SC06L-013SP                        | 6 | 38 | 13,50          | 8              | 3,0 | 0,2 | ◆     |      |
| SC06L-013SP-ALU                    | 6 | 38 | 13,50          | 8              | 3,0 | 0,2 |       | ◆    |
| SC06L-024SP                        | 6 | 49 | 24,00          | 8              | 3,0 | 0,2 | ◆     |      |
| SC06L-024SP-ALU                    | 6 | 49 | 24,00          | 8              | 3,0 | 0,2 |       | ◆    |
| SC06R-013SP                        | 6 | 38 | 13,50          | 8              | 3,0 | 0,2 | ◆     |      |
| SC06R-013SP-ALU                    | 6 | 38 | 13,50          | 8              | 3,0 | 0,2 |       | ◆    |
| SC06R-024SP                        | 6 | 49 | 24,00          | 8              | 3,0 | 0,2 | ◆     |      |
| SC06R-024SP-ALU                    | 6 | 49 | 24,00          | 8              | 3,0 | 0,2 |       | ◆    |
| SC07L-015SP                        | 7 | 42 | 15,75          | 8              | 3,5 | 0,2 | ◆     |      |
| SC07L-015SP-ALU                    | 7 | 42 | 15,75          | 8              | 3,5 | 0,2 |       | ◆    |
| SC07L-028SP                        | 7 | 53 | 28,00          | 8              | 3,5 | 0,2 | ◆     |      |
| SC07L-028SP-ALU                    | 7 | 53 | 28,00          | 8              | 3,5 | 0,2 |       | ◆    |
| SC07R-015SP                        | 7 | 42 | 15,75          | 8              | 3,5 | 0,2 | ◆     |      |
| SC07R-015SP-ALU                    | 7 | 42 | 15,75          | 8              | 3,5 | 0,2 |       | ◆    |
| SC07R-028SP                        | 7 | 53 | 28,00          | 8              | 3,5 | 0,2 | ◆     |      |
| SC07R-028SP-ALU                    | 7 | 53 | 28,00          | 8              | 3,5 | 0,2 |       | ◆    |
| SC08L-018SP                        | 8 | 45 | 18,00          | 8              | 4,0 | 0,2 | ◆     |      |
| SC08L-018SP-ALU                    | 8 | 45 | 18,00          | 8              | 4,0 | 0,2 |       | ◆    |
| SC08L-032SP                        | 8 | 57 | 32,00          | 8              | 4,0 | 0,2 | ◆     |      |
| SC08L-032SP-ALU                    | 8 | 57 | 32,00          | 8              | 4,0 | 0,2 |       | ◆    |
| SC08R-018SP                        | 8 | 45 | 18,00          | 8              | 4,0 | 0,2 | ◆     |      |
| SC08R-018SP-ALU                    | 8 | 45 | 18,00          | 8              | 4,0 | 0,2 |       | ◆    |

8

| Designation<br>Articolo<br>Article | D | l  | l <sub>2</sub> | d <sub>A</sub> | f   | r   | HC    | HU   |
|------------------------------------|---|----|----------------|----------------|-----|-----|-------|------|
|                                    |   |    |                |                |     |     | AL350 | AK10 |
| SC08R-032SP                        | 8 | 57 | 32,00          | 8              | 4,0 | 0,2 | ◆     |      |
| SC08R-032SP-ALU                    | 8 | 57 | 32,00          | 8              | 4,0 | 0,2 |       | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ○ |   |
| M | ● |   |
| K |   | ○ |
| N |   | ● |
| S | ○ |   |
| H |   |   |

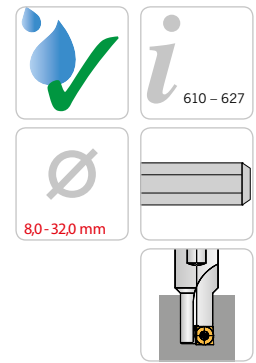
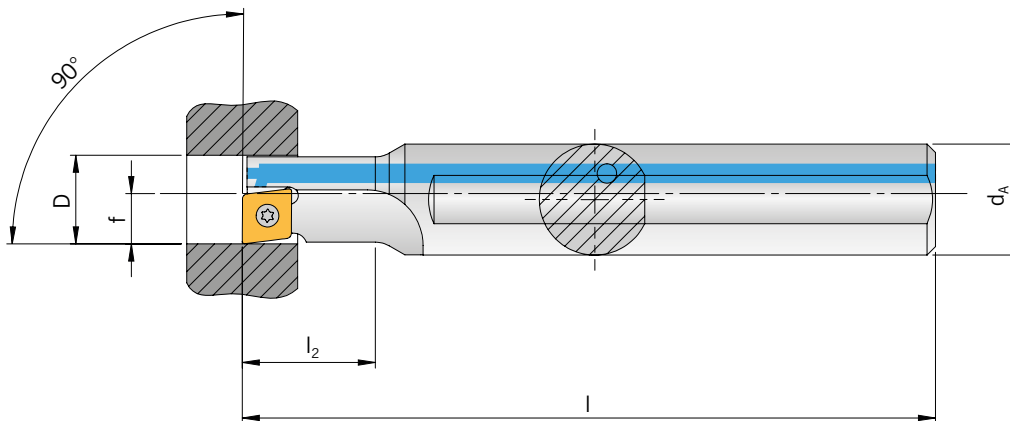
● Main application

Applicazione principale  
Application principale

○ Secondary application

Applicazione secondaria  
Application secondaire

## 1,5 x D



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | D  | l   | l <sub>2</sub> | d <sub>A</sub> | f    | Insert<br>Insero<br>Insert |
|------------------------------------|----|-----|----------------|----------------|------|----------------------------|
| SC08L/R-0012G-04-IP <sup>1)</sup>  | 8  | 80  | 12,0           | 12             | 4,0  | LPET / LPNT 0401...        |
| SC10L/R-0015G-05-IP                | 10 | 90  | 15,0           | 12             | 5,0  | LPET / LPNT 0502...        |
| SC12L/R-0018G-06-IP                | 12 | 100 | 18,0           | 16             | 6,0  | LPET / LPNT 0602...        |
| SC14L/R-0021G-07-IP                | 14 | 110 | 21,0           | 16             | 7,0  | LPET / LPNT 0703...        |
| SC16L/R-0024G-08-IP                | 16 | 125 | 24,0           | 20             | 8,0  | LPET / LPNT 0803...        |
| SC18L/R-0027G-09-IP                | 18 | 135 | 27,0           | 25             | 9,0  | LPET / LPNT 09T3...        |
| SC20L/R-0030G-10-IP                | 20 | 150 | 30,0           | 25             | 10,0 | LPET / LPNT 10T3...        |
| SC25L/R-0038G-13-IP                | 25 | 180 | 37,5           | 32             | 12,5 | LPET / LPNT 1304...        |
| SC32L/R-0048G-17-IP                | 32 | 200 | 48,0           | 40             | 16,0 | LPET / LPNT 1705...        |

**!** Note: Tool holders are supplied with clamping screws and replacement screws but without keys.  
Nota: I portautensili vengono forniti con viti di bloccaggio e viti di ricambio ma senza chiave.  
Remarque : les porte-outils sont fournis avec des vis de blocage et des vis de rechange, mais sans clé.

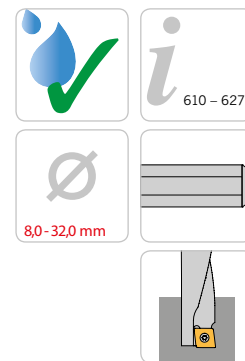
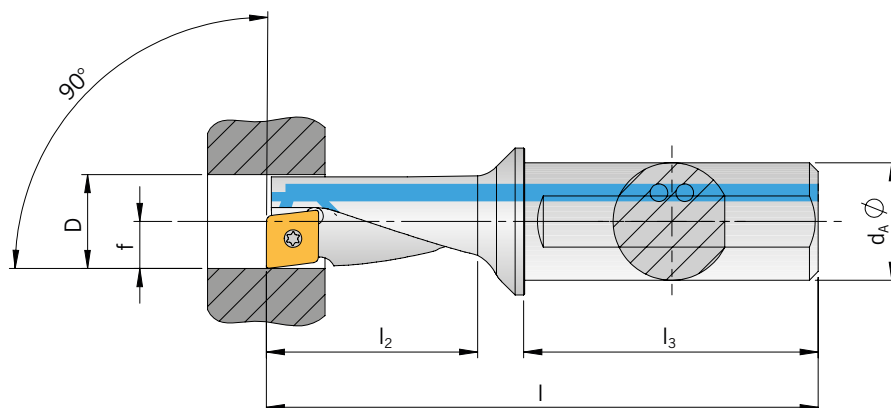
1) Right-hand holder -> Right-hand indexable insert, Left-hand holder -> Left-hand indexable insert  
Adattatore destro -> Insero destro, adattatore sinistro -> Insero sinistro  
Porte-outils à droite -> plaquette de coupe amovible droite, porte-outils à gauche -> plaquette de coupe amovible gauche

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|------------------------------------|----------------------|----------------------|
| SC08L/R- ..SP04-IP                 | AS 0100              | T5106-IP             |
| SC10L/R- ..SP05-IP                 | AS 0101              | T5106-IP             |
| SC12L/R- ..SP06-IP                 | AS 0102              | T5107-IP             |
| SC14L/R- ..SP07-IP                 | AS 0103              | T5108-IP             |
| SC16L/R- ..SP08-IP                 | AS 0104              | T5109-IP             |
| SC18L/R- ..SP09-IP                 | AS 0104              | T5109-IP             |
| SC20L/R- ..SP10-IP                 | AS 0105              | T5115-IP             |
| SC25L/R- ..SP13-IP                 | AS 0105              | T5115-IP             |
| SC32L/R- ..SP17-IP                 | AS 0105              | T5115-IP             |



## 2,25 x D



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | D  | l     | l <sub>2</sub> | l <sub>3</sub> | d <sub>1</sub> | d <sub>A</sub> | f    | Insert<br>Inserto<br>Insert |
|------------------------------------|----|-------|----------------|----------------|----------------|----------------|------|-----------------------------|
| SC08L/R-0018SP-04-IP <sup>1)</sup> | 8  | 60,0  | 18,0           | 38             | 12             | 10             | 4,0  | LPET / LPNT 0401...         |
| SC10L/R-0023SP-05-IP               | 10 | 69,5  | 22,5           | 42             | 16             | 12             | 5,0  | LPET / LPNT 0502...         |
| SC12L/R-0027SP-06-IP               | 12 | 78,0  | 27,0           | 45             | 20             | 16             | 6,0  | LPET / LPNT 0602...         |
| SC14L/R-0032SP-07-IP               | 14 | 83,5  | 31,5           | 45             | 20             | 16             | 7,0  | LPET / LPNT 0703...         |
| SC16L/R-0036SP-08-IP               | 16 | 94,0  | 36,0           | 50             | 25             | 20             | 8,0  | LPET / LPNT 0803...         |
| SC18L/R-0041SP-09-IP               | 18 | 109,5 | 40,5           | 56             | 32             | 25             | 9,0  | LPET / LPNT 0903...         |
| SC20L/R-0045SP-10-IP               | 20 | 111,0 | 45,0           | 56             | 32             | 25             | 10,0 | LPET / LPNT 10T3...         |
| SC25L/R-0057SP-13-IP               | 25 | 129,0 | 56,5           | 60             | 40             | 32             | 12,5 | LPET / LPNT 1304...         |
| SC32L/R-0072SP-17-IP               | 32 | 158,0 | 72,0           | 70             | 50             | 40             | 16,0 | LPET / LPNT 1705...         |

**!** Note: Tool holders are supplied with clamping screws and replacement screws but without keys.  
Nota: I portautensili vengono forniti con viti di bloccaggio e viti di ricambio ma senza chiave.  
Remarque : les porte-outils sont fournis avec des vis de blocage et des vis de rechange, mais sans clé.

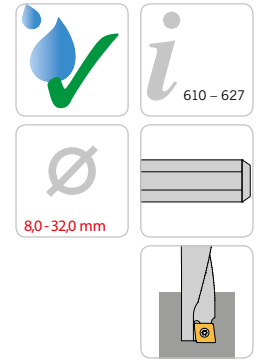
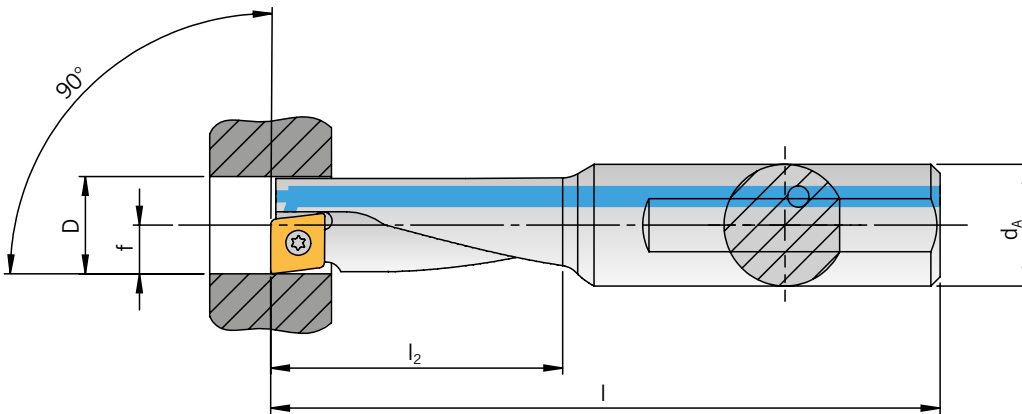
1) Right-hand holder -> Right-hand indexable insert, Left-hand holder -> Left-hand indexable insert  
Adattatore destro -> Inserto destro, adattatore sinistro -> Inserto sinistro  
Porte-outils à droite -> plaquette de coupe amovible droite, porte-outils à gauche -> plaquette de coupe amovible gauche

# 8

### Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|------------------------------------|----------------------|----------------------|
| SC08L/R- ..SP04-IP                 | AS 0100              | T5106-IP             |
| SC10L/R- ..SP05-IP                 | AS 0101              | T5106-IP             |
| SC12L/R- ..SP06-IP                 | AS 0102              | T5107-IP             |
| SC14L/R- ..SP07-IP                 | AS 0103              | T5108-IP             |
| SC16L/R- ..SP08-IP                 | AS 0104              | T5109-IP             |
| SC18L/R- ..SP09-IP                 | AS 0104              | T5109-IP             |
| SC20L/R- ..SP10-IP                 | AS 0105              | T5115-IP             |
| SC25L/R- ..SP13-IP                 | AS 0105              | T5115-IP             |
| SC32L/R- ..SP17-IP                 | AS 0105              | T5115-IP             |

## 3 x D



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

## Holders / Utensili / Porte-outils

### Densimet

| Designation<br>Articolo<br>Article | D  | l   | l <sub>2</sub> | d <sub>A</sub> | f    | Insert<br>Inserto<br>Insert |
|------------------------------------|----|-----|----------------|----------------|------|-----------------------------|
| SC08L/R-0024SP-04-IP <sup>1)</sup> | 8  | 80  | 24             | 12             | 4,0  | LPET / LPNT 0402...         |
| SC10L/R-0030SP-05-IP               | 10 | 85  | 30             | 12             | 5,0  | LPET / LPNT 0502...         |
| SC12L/R-0036SP-06-IP               | 12 | 95  | 36             | 16             | 6,0  | LPET / LPNT 0602...         |
| SC14L/R-0042SP-07-IP               | 14 | 100 | 42             | 16             | 7,0  | LPET / LPNT 0703...         |
| SC16L/R-0048SP-08-IP               | 16 | 110 | 48             | 20             | 8,0  | LPET / LPNT 0803...         |
| SC18L/R-0054SP-09-IP               | 18 | 125 | 54             | 25             | 9,0  | LPET / LPNT 09T3...         |
| SC20L/R-0060SP-10-IP               | 20 | 130 | 60             | 25             | 10,0 | LPET / LPNT 10T3...         |
| SC25L/R-0075SP-13-IP               | 25 | 150 | 75             | 32             | 12,5 | LPET / LPNT 1304...         |
| SC32L/R-0096SP-17-IP               | 32 | 185 | 96             | 40             | 16,0 | LPET / LPNT 1705...         |

**!** Note: Tool holders are supplied with clamping screws and replacement screws but without keys.  
Nota: I portautensili vengono forniti con viti di bloccaggio e viti di ricambio ma senza chiave.  
Remarque : les porte-outils sont fournis avec des vis de blocage et des vis de rechange, mais sans clé.

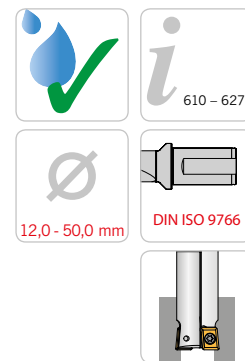
1) Right-hand holder -> Right-hand indexable insert, Left-hand holder -> Left-hand indexable insert  
Adattatore destro -> Inserto destro, adattatore sinistro -> Inserto sinistro  
Porte-outils à droite -> plaquette de coupe amovible droite, porte-outils à gauche -> plaquette de coupe amovible gauche

## Spare Parts / Ricambi / Pièces de rechange

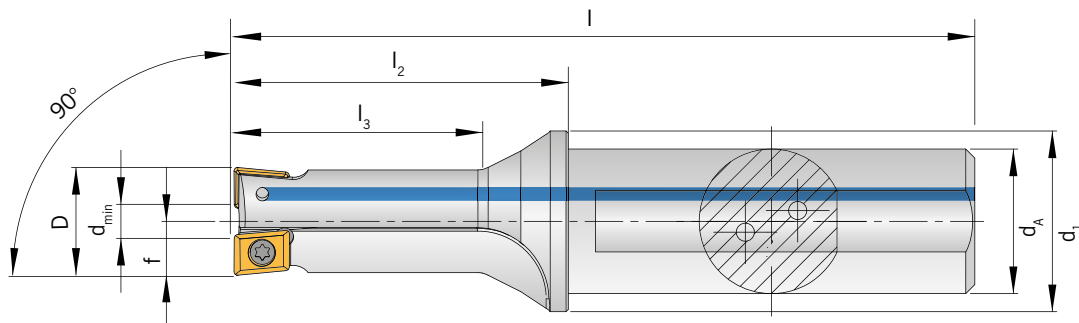
| Holder<br>Utensile<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|------------------------------------|----------------------|----------------------|
| SC08L/R-...SP04-IP                 | AS 0100              | T5106-IP             |
| SC10L/R-...SP05-IP                 | AS 0101              | T5106-IP             |
| SC12L/R-...SP06-IP                 | AS 0102              | T5107-IP             |
| SC14L/R-...SP07-IP                 | AS 0103              | T5108-IP             |
| SC16L/R-...SP08-IP                 | AS 0104              | T5109-IP             |
| SC18L/R-...SP09-IP                 | AS 0104              | T5109-IP             |
| SC20L/R-...SP10-IP                 | AS 0105              | T5115-IP             |
| SC25L/R-...SP13-IP                 | AS 0105              | T5115-IP             |
| SC32L/R-...SP17-IP                 | AS 0105              | T5115-IP             |

## 2,25 x D

2 flute / a 2 tagliente / 2 lèvres



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article   | D    | d <sub>min</sub> | l   | l <sub>2</sub> | l <sub>3</sub> | d <sub>1</sub> | d <sub>A</sub> | f    | z | Insert<br>Insero<br>Insert |
|--------------------------------------|------|------------------|-----|----------------|----------------|----------------|----------------|------|---|----------------------------|
| SCR1204R02-0027G-04-IP <sup>1)</sup> | 12,0 | 4,0              | 82  | 37             | 27             | 20             | 16             | 5,0  | 2 | LPET / LPNT 0401...        |
| SCR1305R02-0029G-04-IP <sup>1)</sup> | 13,0 | 5,0              | 84  | 39             | 29             | 20             | 16             | 6,0  | 2 | LPET / LPNT 0401...        |
| SCR1406R02-0032G-04-IP <sup>1)</sup> | 14,0 | 6,0              | 86  | 41             | 32             | 20             | 16             | 7,0  | 2 | LPET / LPNT 0401...        |
| SCR1507R02-0034G-04-IP <sup>1)</sup> | 15,0 | 7,0              | 88  | 43             | 34             | 20             | 16             | 8,0  | 2 | LPET / LPNT 0401...        |
| SCR1606R02-0036G-05-IP               | 16,0 | 6,0              | 97  | 47             | 36             | 25             | 20             | 7,0  | 2 | LPET / LPNT 0502...        |
| SCR1707R02-0038G-05-IP               | 17,0 | 7,0              | 99  | 49             | 38             | 25             | 20             | 8,0  | 2 | LPET / LPNT 0502...        |
| SCR1806R02-0041G-06-IP <sup>1)</sup> | 18,0 | 6,0              | 102 | 52             | 41             | 25             | 20             | 7,0  | 2 | LPET / LPNT 0602...        |
| SCR1907R02-0043G-06-IP               | 19,0 | 7,0              | 104 | 54             | 43             | 25             | 20             | 8,0  | 2 | LPET / LPNT 0602...        |
| SCR2006R02-0045G-07-IP               | 20,0 | 6,0              | 114 | 58             | 45             | 32             | 25             | 7,0  | 2 | LPET / LPNT 0703...        |
| SCR2208R02-0050G-07-IP               | 22,0 | 8,0              | 118 | 62             | 50             | 32             | 25             | 9,0  | 2 | LPET / LPNT 0703...        |
| SCR2309R02-0052G-07-IP               | 23,0 | 9,0              | 120 | 64             | 52             | 32             | 25             | 10,0 | 2 | LPET / LPNT 0703...        |
| SCR2509R02-0056G-08-IP               | 25,0 | 9,0              | 130 | 70             | 56             | 40             | 32             | 10,0 | 2 | LPET / LPNT 0803...        |
| SCR2709R02-0061G-09-IP               | 27,0 | 9,0              | 137 | 77             | 61             | 40             | 32             | 10,0 | 2 | LPET / LPNT 09T3...        |
| SCR2810R02-0063G-09-IP               | 28,0 | 10,0             | 140 | 80             | 63             | 40             | 32             | 11,0 | 2 | LPET / LPNT 09T3...        |
| SCR3010R02-0068G-10-IP               | 30,0 | 10,0             | 146 | 86             | 68             | 40             | 32             | 11,0 | 2 | LPET / LPNT 10T3...        |
| SCR3111R02-0070G-10-IP               | 31,0 | 11,0             | 149 | 89             | 70             | 40             | 32             | 12,0 | 2 | LPET / LPNT 10T3...        |
| SCR3510R02-0079G-13-IP               | 35,0 | 10,0             | 166 | 96             | 79             | 50             | 40             | 10,0 | 2 | LPET / LPNT 1304...        |
| SCR3611R02-0081G-13-IP               | 36,0 | 11,0             | 168 | 98             | 81             | 50             | 40             | 11,0 | 2 | LPET / LPNT 1304...        |
| SCR17575R02-0039G-05-IP              | 17,5 | 7,5              | 101 | 51             | 39             | 25             | 20             | 8,5  | 2 | LPET / LPNT 0502...        |

**!** Note: Tool holders are supplied with clamping screws and replacement screws but without keys.  
Nota: I portautensili vengono forniti con viti di bloccaggio e viti di ricambio ma senza chiave.  
Remarque : les porte-outils sont fournis avec des vis de blocage et des vis de rechange, mais sans clé.

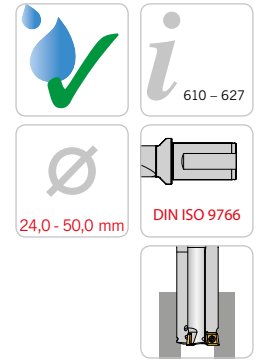
1) Right-hand holder -> Right-hand indexable insert  
Adattatore destro -> Insero destro  
Porte-outils à droite -> plaquette de coupe amovible à droite

## Spare Parts / Ricambi / Pièces de rechange

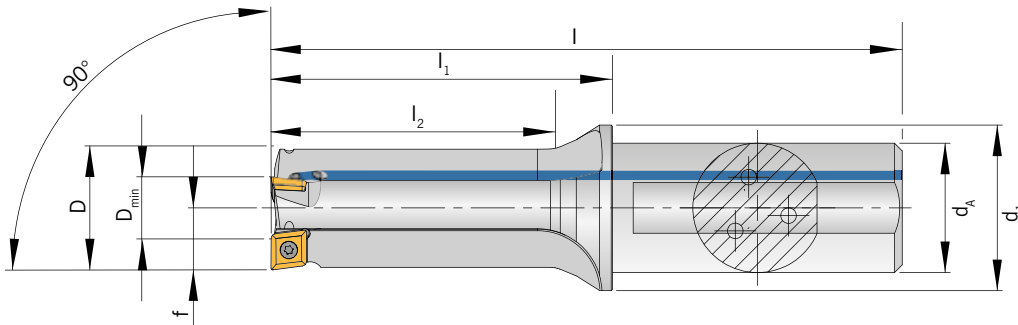
| Holder<br><i>Utensile</i><br>Porte-outils | Screw<br><i>Vite</i><br>Vis | Key<br><i>Chiave</i><br>Clé |
|---|-----------------------------|-----------------------------|
| SCR 1204 R02.. - SCR 1507 R02..           | AS 0100                     | T5106-IP                    |
| SCR 1606 R02.. - SCR 17575 R02..          | AS 0101                     | T5106-IP                    |
| SCR 1806 R02.. - SCR 1907 R02..           | AS 0102                     | T5107-IP                    |
| SCR 2006 R02.. - SCR 2309 R02..           | AS 0103                     | T5108-IP                    |
| SCR 2408 R02.. - SCR 3414 R02..           | AS 0104                     | T5109-IP                    |
| SCR 3510 R02.. - SCR 3611 R02..           | AS 0105                     | T5115-IP                    |

## 2,25 x D

3 flute / a 3 tagliente / 3 lèvres



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article   | D  | d <sub>min</sub> | l   | l <sub>1</sub> | l <sub>2</sub> | d <sub>1</sub> | d <sub>A</sub> | f  | z | Insert<br>Insero<br>Insert |
|--------------------------------------|----|------------------|-----|----------------|----------------|----------------|----------------|----|---|----------------------------|
| SCR2412R03-0054G-06-IP <sup>1)</sup> | 24 | 12               | 122 | 66             | 54             | 32             | 25             | 13 | 3 | LPET / LPNT 0602...        |
| SCR2513R03-0056G-06-IP <sup>1)</sup> | 25 | 13               | 130 | 70             | 56             | 40             | 32             | 14 | 3 | LPET / LPNT 0602...        |
| SCR2814R03-0063G-07-IP               | 28 | 14               | 140 | 80             | 63             | 40             | 32             | 15 | 3 | LPET / LPNT 0703...        |
| SCR3014R03-0068G-08-IP <sup>1)</sup> | 30 | 14               | 146 | 86             | 68             | 40             | 32             | 15 | 3 | LPET / LPNT 0803...        |
| SCR3115R03-0070G-08-IP <sup>1)</sup> | 31 | 15               | 149 | 89             | 70             | 40             | 32             | 16 | 3 | LPET / LPNT 0803...        |
| SCR3216R03-0072G-08-IP <sup>1)</sup> | 32 | 16               | 151 | 91             | 72             | 40             | 32             | 17 | 3 | LPET / LPNT 0803...        |
| SCR3317R03-0074G-08-IP               | 33 | 17               | 154 | 94             | 74             | 40             | 32             | 18 | 3 | LPET / LPNT 0803...        |
| SCR4022R03-0090G-09-IP <sup>1)</sup> | 40 | 22               | 177 | 107            | 90             | 50             | 40             | 23 | 3 | LPET / LPNT 09T3...        |
| SCR5025R03-0113G-13-IP               | 50 | 25               | 203 | 133            | 113            | 55             | 40             | 25 | 3 | LPET / LPNT 1304...        |

**!** Note: Tool holders are supplied with clamping screws and replacement screws but without keys.  
Nota: I portautensili vengono forniti con viti di bloccaggio e viti di ricambio ma senza chiave.  
Remarque: les porte-outils sont fournis avec des vis de blocage et des vis de rechange, mais sans clé.

1) Right-hand holder -> Right-hand indexable insert  
Adattatore destro -> Insero destro  
Porte-outils à droite -> plaquette de coupe amovible à droite

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-outils | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|------------------------------------|----------------------|----------------------|
| SCR 2412 R03.. - SCR 2513 R03..    | AS 0102              | T5107-IP             |
| SCR 2612 R03.. - SCR 2814 R03..    | AS 0103              | T5108-IP             |
| SCR 3014 R03.. - SCR 4022 R03..    | AS 0104              | T5109-IP             |
| SCR 4924 R03.. - SCR 5025 R03..    | AS 0105              | T5115-IP             |

# FINISHING TO MEDIUM MACHINING

## FINITURA E LAVORAZIONE MEDIA

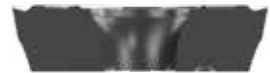
### DE LA FINITION À L'USINAGE DE SEMI-FINITION

#### -AWI WIPER

- WIPER geometry
- Highly polished chip breaker to minimise sticking
- For high surface finish quality
- Geometria di finitura raschiante
- Superficie di spoglia lappata per il minimo attrito
- Per elevata finitura superficiale
- Géométrie de finition large
- Faces de coupe superpolies pour des collages minimaux
- Permet d'obtenir des finitions de surface de grande qualité



one-sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
|                                   |   |  | ● |   |   |

#### -WI WIPER

- WIPER geometry
- For higher feed rates
- For high surface finish quality
- Geometria di finitura raschiante
- Per un avanzamento più elevato
- Per elevata finitura superficiale
- Géométrie de finition large
- Avances plus élevées possibles
- Permet d'obtenir des états de surface de grande qualité



one-sided  
su un lato  
d'un côté



| Finishing<br>Finitura<br>Finition |   | Medium machining<br>Medie asportazioni<br>Usinage de semi-finition |   | Rough machining<br>Sgrossatura<br>Ébauche |   |
|-----------------------------------|---|--|---|---|---|
| P                                 | M | K  | N | S   | H |
| ●                                 | ○ | ●  |   | ○   |   |

8

**MEDIUM MACHINING TO  
ROUGH MACHINING**

*DA LAVORAZIONE MEDIA  
A LAVORAZIONE DI  
SGROSSATURA*

**USINAGE DE SEMI-FINITION  
JUSQU'À L'ÉBAUCHE**

**UNIVERSAL  
UNIVERSALE  
UNIVERSELLES**

- Universal geometry
- Stable cutting edge design
- Good chip breaking
- Geometria universale
- Esecuzione del tagliente stabile
- Buona rottura del truciolo
- Géométrie universelle
- Stabilité de l'arête de coupe
- Bonne fragmentation des copeaux



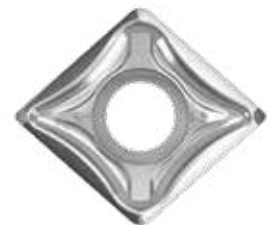
one-sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
| ●  | ○ | ●   |   | ○  |   |

**-ALU**

- Highly polished chip breaker to minimise sticking
- High-positive flute geometry
- Very well suited for aluminium, non-ferrous metals and plastics
- Superficie di spoglia lappata per la minima adesione
- Geometria tagliente altamente positiva
- Ideale per alluminio, metalli non ferrosi e plastica
- Faces de coupe superpolies pour des collages minimaux
- Géométrie de coupe hautement positive
- Convient très bien pour l'aluminium, les métaux non ferreux ainsi que les matières plastiques



one-sided  
su un lato  
d'un côté



|  |   |   |   |  |   |
|--|---|---|---|--|---|
| Finishing<br><i>Finitura</i><br>Finition |   | Medium machining<br><i>Medie asportazioni</i><br>Usinage de semi-finition |   | Rough machining<br><i>Sgrossatura</i><br>Ébauche |   |
| P  | M | K   | N | S  | H |
|  |   |   | ● |  |   |

**HC – SOLID CARBIDE COATED**  
**HC – METALLO DURO RIVESTITO**  
**HC – CARBURE AVEC REVÊTEMENT**

**AL10**

- Specially suited to high cutting speeds
- Extreme wear resistance
- High coating strength
- Particolarmente adatta per velocità di taglio elevate
- Estrema resistenza all'usura
- Elevata resistenza del rivestimento
- Convient particulièrement pour des vitesses de coupe élevées
- Résistance extrême à l'usure
- Revêtement très résistant



Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité



**AM35C**

- Excellent for machining steel
- High degree of toughness
- Good choice for medium cutting speeds
- Eccellente per la lavorazione ad asportazione di truciolo dell'acciaio
- Elevata tenacità
- Buona scelta per media velocità di taglio
- Convient idéalement pour l'usinage d'acier par enlèvement de copeaux
- Ténacité élevée
- Bon choix pour la plage de vitesse de coupe intermédiaire



Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité





Descrizione qualità

Description des nuances

## AP2225

- High wear resistance for steel and cast metal applications
- Stable cutting edge
- Very high thermal stability
- Elevata resistenza all'usura per l'utilizzo con acciaio e pezzi fusi
- Tagliente stabile
- Massima stabilità al calore
- Grande résistance à l'usure pour l'utilisation avec l'acier et la fonte
- Stabilité de l'arête de coupe
- Stabilité thermique maximale

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AP2235

- Very tough substrate
- Very high thermal stability
- Reliable in unstable conditions
- Substrato di base molto tenace
- Massima stabilità al calore
- Affidabile anche in condizioni di instabilità
- Substrat de base très dur
- Stabilité thermique maximale
- Fiable dans les situations d'instabilité

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



## AP7020

- Specially suited for machining stainless materials
- Excellent coating adhesion
- Very high thermal stability
- Particolarmente adatto per la lavorazione di materiali inossidabili
- Eccellente adesione del rivestimento
- Termostabilità molto elevata
- Convient particulièrement pour l'usinage des matériaux inoxydables
- Adhérence exceptionnelle du revêtement
- Grande stabilité thermique

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AL350

- Universally applicable type
- Optimised cutting edge stability
- For medium to low cutting speeds
- Qualità utilizzabile universalmente
- Stabilità del tagliente ottimale
- Per il campo di velocità di taglio medio-basso
- Nuance à usage universel
- Stabilité optimale des arêtes de coupe
- Pour utilisation en vitesses de coupe basses à moyennes

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM4130

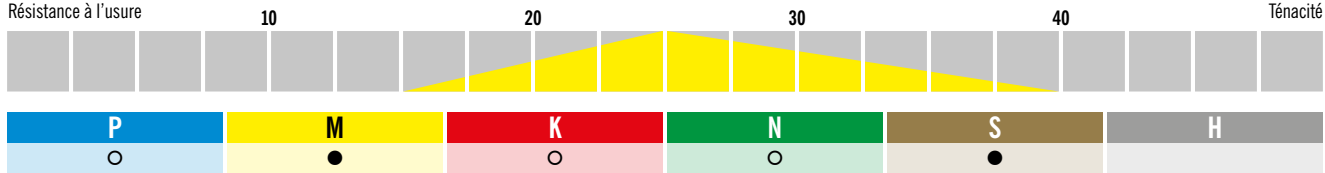
- Wide range of applications for stainless and super alloys
- Good wear resistance
- Very high toughness
- Ampia gamma di utilizzi per materiali inossidabili e superleghe
- Buona resistenza all'usura
- Massima durezza
- Large spectre d'applications avec l'acier inoxydable et les superalliages
- Bonne résistance à l'usure
- Ténacité maximale

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AM5035

- Good choice for machining stainless steels
- Optimised cutting edge stability
- Very good results at medium and low cutting speeds
- Qualità per la lavorazione di acciai inossidabili
- Stabilità del tagliente ottimale
- Ottimi risultati nel campo di velocità di taglio medio-basse
- Bon choix pour l'usinage d'aciers inoxydables
- Stabilité optimale des arêtes de coupe
- Très bon résultats pour des vitesses de coupe basses à moyennes

PVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



Descrizione qualità

Description des nuances

# AK2015

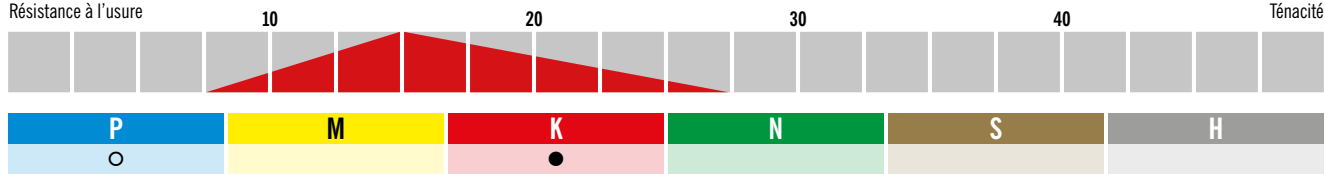
- First choice for machining cast materials
- Ensures toughness and thermal resistance
- Secondary application – also for steel
- *Prima scelta per la lavorazione di materiali fusi*
- *Durezza e resistenza al calore elevate*
- *Limitatamente adatto anche per l'acciaio*
- Premier choix pour l'usinage des fontes
- Garantit ténacité et résistance à la chaleur
- Également adaptée à l'acier en utilisation annexe

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



# AR26C

- Well suited to machining steel and cast metal
- High wear resistance
- Temperature-resistant coating
- *Adatto per la lavorazione di acciaio e materiali colati*
- *Elevata resistenza all'usura*
- *Rivestimento resistente a temperature elevate*
- Convient bien pour l'usinage de l'acier et des fontes
- Grande résistance à l'usure
- Revêtement résistant aux températures

CVD



Wear resistance  
Resistenza all'usura  
Résistance à l'usure

Toughness  
Tenacità  
Ténacité



**HU – SOLID CARBIDE UNCOATED**  
**HU – METALLO DURO NON RIVESTITO**  
**HU – CARBURE SANS REVÊTEMENT**

**AP40**

- Specially for machining steel
- Applications at cutting speeds below 80 m/min
- Good toughness for unfavourable stability conditions
- Particolarmente adatto alla lavorazione dell'acciaio
- Impiego con velocità di taglio inferiori a 80 m/min
- Buona durezza per condizioni di stabilità sfavorevoli
- Spécialement conçue pour l'usinage de l'acier
- Utilisation à des vitesses de coupe inférieures à 80 m/min
- Bonne ténacité dans des conditions de stabilité défavorables



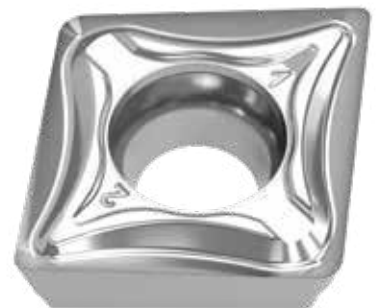
Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité



**AK10**

- Also suitable for machining non-ferrous metals
- Secondary application – for cast metal, titanium and titanium alloys
- Fine-grain carbide substrate
- Adatto principalmente per la lavorazione di metalli non ferrosi
- Adatto come applicazione secondaria per materiali fusi come titanio e leghe di titanio
- Substrato micrograna
- Convient bien pour l'usinage de métaux non ferreux
- Adaptée à la fonte ainsi qu'au titane et aux alliages de titane en utilisation annexe
- Substrat en carbure micrograins



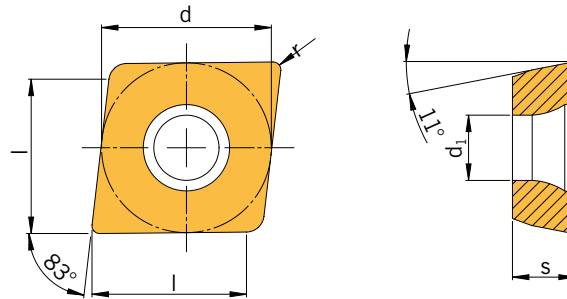
Wear resistance  
 Resistenza all'usura  
 Résistance à l'usure

Toughness  
 Tenacità  
 Ténacité



8

## LPET



| Designation<br>Articolo<br>Article | l    | d    | s    | r   | d <sub>1</sub> | HC   |       |       | HU   |
|------------------------------------|------|------|------|-----|----------------|------|-------|-------|------|
|                                    |      |      |      |     |                | AL10 | AM35C | AR26C | AK10 |
| LPET 040104FL-ALU <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,4 | 2,10           | ◆    |       |       | ◆    |
| LPET 040104FR-ALU <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,4 | 2,10           | ◆    |       |       | ◆    |
| LPET 050204FN-ALU                  | 5,0  | 5,8  | 2,10 | 0,4 | 2,25           | ◆    |       |       | ◆    |
| LPET 060204FN-ALU                  | 6,0  | 6,5  | 2,38 | 0,4 | 2,50           | ◆    |       |       | ◆    |
| LPET 070304FN-ALU                  | 7,0  | 7,6  | 3,18 | 0,4 | 2,80           | ◆    |       |       | ◆    |
| LPET 080304FN-ALU                  | 8,0  | 8,5  | 3,18 | 0,4 | 3,40           | ◆    |       |       | ◆    |
| LPET 09T304FN-ALU                  | 9,0  | 9,6  | 3,00 | 0,4 | 3,40           | ◆    |       |       | ◆    |
| LPET 10T304FN-ALU                  | 10,0 | 10,6 | 3,97 | 0,4 | 4,40           | ◆    |       |       | ◆    |
| LPET 130404FN-ALU                  | 12,5 | 13,5 | 4,76 | 0,4 | 5,30           | ◆    |       |       | ◆    |
| LPET 170508FN-ALU                  | 16,0 | 17,5 | 5,56 | 0,8 | 5,30           | ◆    |       |       | ◆    |
| LPET 040102FL-AWI <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,2 | 2,10           | ◆    |       |       | ◆    |
| LPET 040102FR-AWI <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,2 | 2,10           | ◆    |       |       | ◆    |
| LPET 040104FL-AWI <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,4 | 2,10           | ◆    |       |       | ◆    |
| LPET 040104FR-AWI <sup>1)</sup>    | 4,0  | 4,5  | 1,80 | 0,4 | 2,10           | ◆    |       |       | ◆    |
| LPET 050202FN-AWI                  | 5,0  | 5,8  | 2,10 | 0,2 | 2,25           | ◆    |       |       | ◆    |
| LPET 050204FN-AWI                  | 5,0  | 5,8  | 2,10 | 0,4 | 2,25           | ◆    |       |       | ◆    |
| LPET 060202FN-AWI                  | 6,0  | 6,5  | 2,38 | 0,2 | 2,50           | ◆    |       |       | ◆    |
| LPET 060204FN-AWI                  | 6,0  | 6,5  | 2,38 | 0,4 | 2,50           | ◆    |       |       | ◆    |
| LPET 070304FN-AWI                  | 7,0  | 7,6  | 3,18 | 0,4 | 2,80           | ◆    |       |       | ◆    |
| LPET 080304FN-AWI                  | 8,0  | 8,5  | 3,18 | 0,4 | 3,40           | ◆    |       |       | ◆    |
| LPET 09T304FN-AWI                  | 9,0  | 9,6  | 3,97 | 0,4 | 3,40           | ◆    |       |       | ◆    |
| LPET 10T304FN-AWI                  | 10,0 | 10,6 | 3,97 | 0,4 | 4,40           | ◆    |       |       | ◆    |
| LPET 10T308FN-AWI                  | 10,0 | 10,6 | 3,97 | 0,8 | 4,40           | ◆    |       |       | ◆    |
| LPET 130404FN-AWI                  | 12,5 | 13,5 | 4,76 | 0,4 | 5,30           | ◆    |       |       | ◆    |
| LPET 130408FN-AWI                  | 12,5 | 13,5 | 4,76 | 0,8 | 5,30           | ◆    |       |       | ◆    |
| LPET 170508FN-AWI                  | 16,0 | 17,5 | 5,56 | 0,8 | 5,30           | ◆    |       |       | ◆    |
| LPET 060204EN-WI                   | 6,0  | 6,5  | 2,38 | 0,4 | 2,50           |      | ◆     | ◆     |      |
| LPET 070304EN-WI                   | 7,0  | 7,6  | 3,18 | 0,4 | 2,80           |      | ◆     | ◆     |      |
| LPET 080304EN-WI                   | 8,0  | 8,5  | 3,18 | 0,4 | 3,40           |      | ◆     | ◆     |      |
| LPET 09T304EN-WI                   | 9,0  | 9,6  | 3,97 | 0,4 | 3,40           |      |       | ◆     |      |
| LPET 10T304EN-WI                   | 10,0 | 10,6 | 3,97 | 0,4 | 4,40           |      | ◆     |       |      |
| LPET 130404EN-WI                   | 12,5 | 13,5 | 4,76 | 0,4 | 5,30           |      | ◆     |       |      |

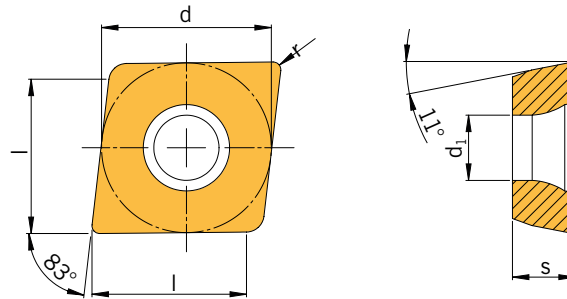
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

1) Right-hand holder -> Right-hand indexable insert, Left-hand holder -> Left-hand indexable insert  
Adattatore destro -> Inserto destro, adattatore sinistro -> Inserto sinistro  
Porte-outils à droite -> plaquette de coupe amovible droite, porte-outils à gauche -> plaquette de coupe amovible gauche

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● | ● | ● |   |
| M | ○ | ○ |   |   |
| K | ● |   | ● | ○ |
| N | ○ |   |   | ● |
| S | ○ |   |   | ○ |
| H |   |   |   |   |

## LPNT



| Designation<br>Articolo<br>Article | l    | d    | s    | r   | d <sub>1</sub> | HC     |       |       |        |        |        |        |        | HU    |      |   |   |
|------------------------------------|------|------|------|-----|----------------|--------|-------|-------|--------|--------|--------|--------|--------|-------|------|---|---|
|                                    |      |      |      |     |                | AK2015 | AL350 | AM35C | AM4130 | AM5035 | AP2225 | AP2235 | AP7020 | AR26C | AP40 |   |   |
| LPNT 040102E L/R <sup>1)</sup>     | 4,0  | 4,5  | 1,80 | 0,2 | 2,10           |        | ◆     | ◆     |        |        |        |        |        |       |      |   |   |
| LPNT 040104E L/R <sup>1)</sup>     | 4,0  | 4,5  | 1,80 | 0,4 | 2,10           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      |        |        | ◆     |      | ◆ |   |
| LPNT 050202EN                      | 5,0  | 5,8  | 2,10 | 0,2 | 2,25           |        | ◆     | ◆     | ◆      |        | ◆      | ◆      |        |       |      |   | ◆ |
| LPNT 050204EN                      | 5,0  | 5,8  | 2,10 | 0,4 | 2,25           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      | ◆      |        | ◆     |      |   |   |
| LPNT 060202EN                      | 6,0  | 6,5  | 2,38 | 0,2 | 2,50           |        | ◆     | ◆     |        |        |        |        |        |       |      |   | ◆ |
| LPNT 060204EN                      | 6,0  | 6,5  | 2,38 | 0,4 | 2,50           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      | ◆      |        | ◆     |      |   |   |
| LPNT 070304EN                      | 7,0  | 7,6  | 3,18 | 0,4 | 2,80           |        | ◆     | ◆     | ◆      | ◆      | ◆      | ◆      |        | ◆     |      |   | ◆ |
| LPNT 080304EN                      | 8,0  | 8,5  | 3,18 | 0,4 | 3,40           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      | ◆      |        | ◆     |      |   | ◆ |
| LPNT 09T304EN                      | 9,0  | 9,6  | 3,97 | 0,4 | 3,40           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      |        |        | ◆     |      |   | ◆ |
| LPNT 10T304EN                      | 10,0 | 10,6 | 3,97 | 0,4 | 4,40           | ◆      | ◆     | ◆     | ◆      | ◆      | ◆      |        | ◆      | ◆     |      |   | ◆ |
| LPNT 10T308EN                      | 10,0 | 10,6 | 3,97 | 0,8 | 4,40           |        | ◆     | ◆     |        |        |        |        |        |       |      |   | ◆ |
| LPNT 130404EN                      | 12,5 | 13,5 | 4,76 | 0,4 | 5,30           |        | ◆     | ◆     | ◆      | ◆      | ◆      | ◆      |        | ◆     |      |   | ◆ |
| LPNT 130408EN                      | 12,5 | 13,5 | 4,76 | 0,8 | 5,30           |        | ◆     | ◆     | ◆      | ◆      | ◆      |        | ◆      | ◆     |      |   | ◆ |
| LPNT 170508EN                      | 16,0 | 17,5 | 5,56 | 0,8 | 5,30           |        | ◆     | ◆     | ◆      | ◆      | ◆      |        |        | ◆     |      |   | ◆ |
| LPNT 080304EN-WI                   | 8,0  | 8,5  | 3,18 | 0,4 | 3,40           |        |       |       | ◆      |        | ◆      |        |        |       |      |   |   |
| LPNT 09T304EN-WI                   | 9,0  | 9,6  | 3,97 | 0,4 | 3,40           |        |       |       | ◆      |        | ◆      |        |        |       |      |   |   |
| LPNT 10T304EN-WI                   | 10,0 | 10,6 | 3,97 | 0,4 | 4,40           |        |       |       | ◆      |        | ◆      |        |        |       |      |   |   |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

1) Right-hand holder -> Right-hand indexable insert,  
Left-hand holder -> Left-hand indexable insert  
Adattatore destro -> Insetto destro, adattatore sinistro -> Insetto sinistro  
Porte-outils à droite -> plaquette de coupe amovible droite,  
porte-outils à gauche -> plaquette de coupe amovible gauche

|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| P | ○ | ○ | ● | ○ | ○ | ● | ● | ○ | ● | ● |
| M |   | ● | ○ | ● | ● | ○ | ○ | ● |   | ○ |
| K | ● |   |   | ○ |   | ● | ● |   | ● |   |
| N |   |   |   | ○ |   |   |   |   |   |   |
| S |   | ○ |   | ● | ○ |   | ○ | ○ |   |   |
| H |   |   |   |   |   |   |   |   |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



# Recommended cutting data

| Material group                            | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                 |                   |
|---|---|---|---------------------|--|----------------|--------------------------|-----------------|-------------------|
|   |   |   |                     |  |                | HC                       |                 |                   |
|   |   |   |                     |  |                | AK2015                   | AL10            | AL350             |
| <b>P</b>                                  | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 120 - 170 - 220          | 200 - 250 - 300 | 120 - 175 - 230   |
|   |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 100 - 130 - 160          | 170 - 225 - 280 | 80 - 120 - 160    |
|   |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 100 - 130 - 160          | 160 - 205 - 250 | 80 - 120 - 160    |
|   |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 100 - 130 - 160          | 160 - 205 - 250 | 80 - 120 - 160    |
|   |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 80 - 105 - 130           | 150 - 200 - 250 | 50 - 90 - 130     |
|   | Low alloyed steel   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | 80 - 110 - 140           | 150 - 200 - 250 | 60 - 95 - 130     |
|   |   | annealed  | 175                 | 591                                      | P7             | 100 - 130 - 160          | 170 - 220 - 270 | 80 - 120 - 160    |
|   |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 70 - 100 - 130           | 160 - 205 - 250 | 60 - 95 - 130     |
|   |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 60 - 95 - 130            | 150 - 200 - 250 | 60 - 90 - 120     |
|   |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 60 - 85 - 110            | 150 - 185 - 220 | 60 - 80 - 100     |
|   | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 90 - 115 - 140           | -               | 80 - 110 - 140    |
|   |   | hardened  | 300                 | 1013                                     | P12            | 60 - 85 - 110            | -               | 50 - 75 - 100     |
|   |   | hardened  | 400                 | 1361                                     | P13            | 60 - 85 - 110            | -               | 50 - 75 - 100     |
| Stainless steel                           | ferretic / martensitic, annealed                            | 200   | 675                 | P14                                      | -              | 160 - 220 - 280          | 50 - 125 - 200  |                   |
|   | martensitic, hardened and tempered                          | 330   | 1114                | P15                                      | -              | 140 - 210 - 280          | 50 - 100 - 150  |                   |
| <b>M</b>                                  | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | -                        | 140 - 210 - 280 | 50 - 120 - 190    |
|   |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | -                        | -               | 50 - 75 - 100     |
|   |   | austenitic-ferritic, Duplex                     | 230                 | 778                                      | M3             | -                        | -               | 50 - 75 - 100     |
|   |   | ferritic  | 200                 | 675                                      | K1             | 120 - 180 - 240          | 150 - 175 - 200 | -                 |
| <b>K</b>                                  | Malleable cast iron   | pearlitic                                       | 260                 | 867                                      | K2             | 120 - 180 - 240          | 140 - 170 - 200 | -                 |
|   |   | low tensile strength                            | 180                 | 602                                      | K3             | 140 - 190 - 240          | 170 - 235 - 300 | -                 |
|   | Cast iron   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 120 - 155 - 190          | 120 - 180 - 240 | -                 |
|   |   | ferritic  | 155                 | 518                                      | K5             | 130 - 185 - 240          | 140 - 185 - 230 | -                 |
|   | Cast iron with nodular graphite                             | pearlitic                                       | 265                 | 885                                      | K6             | 130 - 185 - 240          | 120 - 145 - 170 | -                 |
|   |   | GGV (CGI)                                       | 200                 | 675                                      | K7             | 140 - 190 - 240          | 170 - 235 - 300 | -                 |
|   | <b>N</b>  | Aluminium alloys long chipping                  | not heat treatable  | 30                                       | -              | N1                       | -               | 800 - 1050 - 1300 |
| heat treatable, heat treated              |   |   | 100                 | 343                                      | N2             | -                        | 400 - 650 - 900 | -                 |
| ≤ 12 % Si, not heat treatable             |   |   | 75                  | 260                                      | N3             | -                        | 250 - 525 - 800 | -                 |
| Casted aluminium alloys                   |   | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | -                        | 200 - 375 - 550 | -                 |
|   |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | -                        | 200 - 375 - 550 | -                 |
| Magnesium alloys                          |   | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -               | -                 |
|   |   | Unalloyed, electrolyte copper                   | 100                 | 343                                      | N7             | -                        | -               | -                 |
| Copper and copper alloys (Brass / Bronze) |   | Brass, Bronze                                   | 90                  | 314                                      | N8             | -                        | -               | -                 |
|   |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | -                        | -               | -                 |
|   |   |   | 300                 | 1013                                     | N10            | -                        | -               | -                 |
|   |   | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -               | -                 |
| Non-ferrous materials                     |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -               | -                 |
|   |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -               | -                 |
|   |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -               | -                 |
|   |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -               | -                 |
|   |   | Graphite (tech.)                                | 80 Shore            | -  | N16            | -                        | -               | -                 |
| <b>S</b>                                  | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | -                        | 20 - 35 - 50    | 20 - 35 - 50      |
|   |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | -                        | 20 - 35 - 50    | 20 - 30 - 40      |
|   |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | -                        | 15 - 30 - 40    | 15 - 20 - 25      |
|   |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | -                        | 15 - 25 - 30    | -                 |
|   |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | 15 - 25 - 30    | -                 |
|   | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | -                        | -               | 50 - 85 - 120     |
|   |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | -                        | -               | 30 - 40 - 50      |
|   |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -               | 30 - 40 - 50      |
|   | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -               | -                 |
|   | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -               | -                 |
| <b>H</b>                                  | Hardened steel  | hardened  | 50 HRC              | -  | H1             | -                        | -               | -                 |
|   |   | hardened  | 55 HRC              | -  | H2             | -                        | -               | -                 |
|   |   | hardened  | 60 HRC              | -  | H3             | -                        | -               | -                 |
|   | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -               | -                 |

The recommended cutting data are only approximate values.

It may be necessary to adjust them to each individual machining application.

HC = Solid carbide coated

HU = Solid carbide uncoated

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# Parametri di taglio suggeriti

| Gruppo materiale                       | Struttura dei gruppi di materiali e lettere di riferimento |   |                 |          |                 | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro  | Velocità di taglio Vc (m/min) |      |       |
|--|--|---|-----------------|----------|-----------------|-----------------|------------------------------------|-------------------|-------------------------------|------|-------|
|  |  |   |                 |          |                 |                 |                                    |                   | HC                            |      |       |
|  |  |   |                 |          |                 |                 |                                    |                   | AK2015                        | AL10 | AL350 |
| <b>P</b>                               | Acciai non legato  | C ≤ 0,25 %  | ricotto         | 125      | 428             | P1              | 120 - 170 - 220                    | 200 - 250 - 300   | 120 - 175 - 230               |      |       |
|  |  | C >= 0,25 ... >= 0,55 %                                   | ricotto         | 190      | 639             | P2              | 100 - 130 - 160                    | 170 - 225 - 280   | 80 - 120 - 160                |      |       |
|  |  | C >= 0,25 ... >= 0,55 %                                   | bonificato      | 210      | 708             | P3              | 100 - 130 - 160                    | 160 - 205 - 250   | 80 - 120 - 160                |      |       |
|  |  | C ≤ 0,55 %  | ricotto         | 190      | 639             | P4              | 100 - 130 - 160                    | 160 - 205 - 250   | 80 - 120 - 160                |      |       |
|  |  | C ≤ 0,55 %  | bonificato      | 300      | 1013            | P5              | 80 - 105 - 130                     | 150 - 200 - 250   | 50 - 90 - 130                 |      |       |
|  |  | Acciaio (truciolo corto)                                  | ricotto         | 220      | 745             | P6              | 80 - 110 - 140                     | 150 - 200 - 250   | 60 - 95 - 130                 |      |       |
|  | Acciai debolmente legati                                   | ricotto   | 175             | 591      | P7              | 100 - 130 - 160 | 170 - 220 - 270                    | 80 - 120 - 160    |                               |      |       |
|  |  | bonificato  | 300             | 1013     | P8              | 70 - 100 - 130  | 160 - 205 - 250                    | 60 - 95 - 130     |                               |      |       |
|  |  | bonificato  | 380             | 1282     | P9              | 60 - 95 - 130   | 150 - 200 - 250                    | 60 - 90 - 120     |                               |      |       |
|  |  | bonificato  | 430             | 1477     | P10             | 60 - 85 - 110   | 150 - 185 - 220                    | 60 - 80 - 100     |                               |      |       |
|  | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675      | P11             | 90 - 115 - 140  | -                                  | 80 - 110 - 140    |                               |      |       |
|  |  | temprato e rinvenuto                                      | 300             | 1013     | P12             | 60 - 85 - 110   | -                                  | 50 - 75 - 100     |                               |      |       |
|  |  | temprato e rinvenuto                                      | 400             | 1361     | P13             | 60 - 85 - 110   | -                                  | 50 - 75 - 100     |                               |      |       |
|  | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675      | P14             | -               | 160 - 220 - 280                    | 50 - 125 - 200    |                               |      |       |
| martensitico, bonificato               |  | 330   | 1114            | P15      | -               | 140 - 210 - 280 | 50 - 100 - 150                     |                   |                               |      |       |
| austenitico, trattato o temperato      |  | 200   | 675             | M1       | -               | 140 - 210 - 280 | 50 - 120 - 190                     |                   |                               |      |       |
| <b>M</b> Acciai inossidabili           | austenitico, indurimento per precipitazione (PH)           | 300   | 1013            | M2       | -               | -               | 50 - 75 - 100                      |                   |                               |      |       |
|  | austenitico-ferritico, Duplex                              | 230   | 778             | M3       | -               | -               | 50 - 75 - 100                      |                   |                               |      |       |
|  | ferritico  | 200   | 675             | K1       | 120 - 180 - 240 | 150 - 175 - 200 | -                                  |                   |                               |      |       |
| <b>K</b> Ghisa temprata                | perlitica  | 260   | 867             | K2       | 120 - 180 - 240 | 140 - 170 - 200 | -                                  |                   |                               |      |       |
|  | Ghisa grigia   | bassa resistenza  | 180             | 602      | K3              | 140 - 190 - 240 | 170 - 235 - 300                    | -                 |                               |      |       |
|  |  | alta resistenza / austenitico                             | 245             | 825      | K4              | 120 - 155 - 190 | 120 - 180 - 240                    | -                 |                               |      |       |
|  | Ghisa sferoidale   | ferritico   | 155             | 518      | K5              | 130 - 185 - 240 | 140 - 185 - 230                    | -                 |                               |      |       |
|  |  | perlitica   | 265             | 885      | K6              | 130 - 185 - 240 | 120 - 145 - 170                    | -                 |                               |      |       |
|  | GGV (CGI)  |   | 200             | 675      | K7              | 140 - 190 - 240 | 170 - 235 - 300                    | -                 |                               |      |       |
|  | <b>N</b>   | Leghe di Alluminio stampato                               | non invecchiato | 30       | -               | N1              | -                                  | 800 - 1050 - 1300 | -                             |      |       |
| rinvenuto, invecchiato                 |  |   | 100             | 343      | N2              | -               | 400 - 650 - 900                    | -                 |                               |      |       |
| Leghe di Alluminio da fusione          |  | ≤ 12 % Si, non invecchiato                                | 75              | 260      | N3              | -               | 250 - 525 - 800                    | -                 |                               |      |       |
|  |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314      | N4              | -               | 200 - 375 - 550                    | -                 |                               |      |       |
|  |  | > 12 % Si, non invecchiato                                | 130             | 447      | N5              | -               | 200 - 375 - 550                    | -                 |                               |      |       |
| Leghe di magnesio                      |  | > 12 % Si, non invecchiato                                | 70              | 250      | N6              | -               | -                                  | -                 |                               |      |       |
| Rame e Leghe di Rame (Bronzo / Ottone) |  | Non legati, Rame Elettrolitico                            | 100             | 343      | N7              | -               | -                                  | -                 |                               |      |       |
|  |  | Ottone, Bronzo  | 90              | 314      | N8              | -               | -                                  | -                 |                               |      |       |
|  |  | Leghe Cu, truciolo corto                                  | 110             | 382      | N9              | -               | -                                  | -                 |                               |      |       |
|  |  |   | 300             | 1013     | N10             | -               | -                                  | -                 |                               |      |       |
| Materiali non metallici                |  | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -        | N11             | -               | -                                  | -                 |                               |      |       |
|  |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -        | N12             | -               | -                                  | -                 |                               |      |       |
|  |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -        | N13             | -               | -                                  | -                 |                               |      |       |
|  |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -        | N14             | -               | -                                  | -                 |                               |      |       |
|  |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -        | N15             | -               | -                                  | -                 |                               |      |       |
|  |  | Grafite (tecnico)   |                 | 80 Shore | -               | N16             | -                                  | -                 | -                             |      |       |
| <b>S</b>                               | Leghe resistenti al calore                                 | Base-Fe   | ricotto         | 200      | 675             | S1              | -                                  | 20 - 35 - 50      | 20 - 35 - 50                  |      |       |
|  |  | Base-Fe   | invecchiato     | 280      | 943             | S2              | -                                  | 20 - 35 - 50      | 20 - 30 - 40                  |      |       |
|  |  | Base Ni o Co  | ricotto         | 250      | 839             | S3              | -                                  | 15 - 30 - 40      | 15 - 20 - 25                  |      |       |
|  |  | Base Ni o Co  | invecchiato     | 350      | 1177            | S4              | -                                  | 15 - 25 - 30      | -                             |      |       |
|  |  | Base Ni o Co  | da fusione      | 320      | 1076            | S5              | -                                  | 15 - 25 - 30      | -                             |      |       |
|  | Leghe di Titanio   | Titanio puro  | 200             | 675      | S6              | -               | -                                  | 50 - 85 - 120     |                               |      |       |
|  |  | Leghe α e β, invecchiato                                  | 375             | 1262     | S7              | -               | -                                  | 30 - 40 - 50      |                               |      |       |
|  |  | Leghe β   | 410             | 1396     | S8              | -               | -                                  | 30 - 40 - 50      |                               |      |       |
|  | Leghe di tungsteno   |   | 300             | 1013     | S9              | -               | -                                  | -                 |                               |      |       |
|  | Leghe di molibdeno   |   | 300             | 1013     | S10             | -               | -                                  | -                 |                               |      |       |
| <b>H</b>                               | Acciaio Temprato   | temprato e rinvenuto                                      |                 | 50 HRC   | -               | H1              | -                                  | -                 |                               |      |       |
|  |  | temprato e rinvenuto                                      |                 | 55 HRC   | -               | H2              | -                                  | -                 |                               |      |       |
|  |  | temprato e rinvenuto                                      |                 | 60 HRC   | -               | H3              | -                                  | -                 |                               |      |       |
|  | Ghisa Temprata   | temprato e rinvenuto                                      |                 | 55 HRC   | -               | H4              | -                                  | -                 |                               |      |       |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

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| Groupe de matériaux                       | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                   |                 |  |
|---|--|---|----------------|------------------------------------|-------------------|-----------------------------|-------------------|-----------------|--|
|   |  |   |                |                                    |                   | HC                          |                   |                 |  |
|   |  |   |                |                                    |                   | AK2015                      | AL10              | AL350           |  |
| <b>P</b>                                  | Acier non allié  | C ≤ 0,25 % recuit                                   | 125            | 428                                | P1                | 120 - 170 - 220             | 200 - 250 - 300   | 120 - 175 - 230 |  |
|   |  | C >= 0,25 ... >= 0,55 % recuit                      | 190            | 639                                | P2                | 100 - 130 - 160             | 170 - 225 - 280   | 80 - 120 - 160  |  |
|   |  | C >= 0,25 ... >= 0,55 % traité                      | 210            | 708                                | P3                | 100 - 130 - 160             | 160 - 205 - 250   | 80 - 120 - 160  |  |
|   |  | C ≤ 0,55 % recuit                                   | 190            | 639                                | P4                | 100 - 130 - 160             | 160 - 205 - 250   | 80 - 120 - 160  |  |
|   |  | C ≤ 0,55 % traité                                   | 300            | 1013                               | P5                | 80 - 105 - 130              | 150 - 200 - 250   | 50 - 90 - 130   |  |
|   |  | Aciers de décolletage (à copeaux courts) recuit     | 220            | 745                                | P6                | 80 - 110 - 140              | 150 - 200 - 250   | 60 - 95 - 130   |  |
|   | Acier faiblement allié   | recuit  | 175            | 591                                | P7                | 100 - 130 - 160             | 170 - 220 - 270   | 80 - 120 - 160  |  |
|   |  | traité  | 300            | 1013                               | P8                | 70 - 100 - 130              | 160 - 205 - 250   | 60 - 95 - 130   |  |
|   |  | traité  | 380            | 1282                               | P9                | 60 - 95 - 130               | 150 - 200 - 250   | 60 - 90 - 120   |  |
|   |  | traité  | 430            | 1477                               | P10               | 60 - 85 - 110               | 150 - 185 - 220   | 60 - 80 - 100   |  |
|   | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | 90 - 115 - 140              | -                 | 80 - 110 - 140  |  |
|   |  | trempe et revenu                                    | 300            | 1013                               | P12               | 60 - 85 - 110               | -                 | 50 - 75 - 100   |  |
|   |  | trempe et revenu                                    | 400            | 1361                               | P13               | 60 - 85 - 110               | -                 | 50 - 75 - 100   |  |
| Acier inox                                | ferritique, martensitique, recuit                              | 200   | 675            | P14                                | -                 | 160 - 220 - 280             | 50 - 125 - 200    |                 |  |
|   | martensitique, traité  | 330   | 1114           | P15                                | -                 | 140 - 210 - 280             | 50 - 100 - 150    |                 |  |
| <b>M</b>                                  | Acier inox   | austénitique  | 200            | 675                                | M1                | -                           | 140 - 210 - 280   | 50 - 120 - 190  |  |
|   |  | austénitique  | 300            | 1013                               | M2                | -                           | -                 | 50 - 75 - 100   |  |
|   |  | austénitique-ferritique, Duplex                     | 230            | 778                                | M3                | -                           | -                 | 50 - 75 - 100   |  |
| <b>K</b>                                  | Fonte malléable  | ferritique  | 200            | 675                                | K1                | 120 - 180 - 240             | 150 - 175 - 200   | -               |  |
|   |  | perlitique  | 260            | 867                                | K2                | 120 - 180 - 240             | 140 - 170 - 200   | -               |  |
|   | Fonte grise  | faible résistance                                   | 180            | 602                                | K3                | 140 - 190 - 240             | 170 - 235 - 300   | -               |  |
|   |  | haute résistance / austénitique                     | 245            | 825                                | K4                | 120 - 155 - 190             | 120 - 180 - 240   | -               |  |
| Fonte à Graphite sphéroïdale              | ferritique   | 155   | 518            | K5                                 | 130 - 185 - 240   | 140 - 185 - 230             | -                 |                 |  |
|   | perlitique   | 265   | 885            | K6                                 | 130 - 185 - 240   | 120 - 145 - 170             | -                 |                 |  |
| GGV (CGI)                                 |  | 200   | 675            | K7                                 | 140 - 190 - 240   | 170 - 235 - 300             | -                 |                 |  |
| <b>N</b>                                  | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement                | 30             | -                                  | N1                | -                           | 800 - 1050 - 1300 | -               |  |
|   |  | pouvant subir un durcissement, durci                | 100            | 343                                | N2                | -                           | 400 - 650 - 900   | -               |  |
|   | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement     | 75             | 260                                | N3                | -                           | 250 - 525 - 800   | -               |  |
|   |  | ≤ 12 % Si, pouvant subir un durcissement, durci     | 90             | 314                                | N4                | -                           | 200 - 375 - 550   | -               |  |
|   |  | > 12 % Si, ne pouvant pas subir de durcissement     | 130            | 447                                | N5                | -                           | 200 - 375 - 550   | -               |  |
|   | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement     | 70             | 250                                | N6                | -                           | -                 | -               |  |
|   |  | non allié, cuivre électrolytique                    | 100            | 343                                | N7                | -                           | -                 | -               |  |
|   | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                         | 90             | 314                                | N8                | -                           | -                 | -               |  |
|   |  | Alliage de cuivre à copeaux courts                  | 110            | 382                                | N9                | -                           | -                 | -               |  |
|   | Matériaux non métalliques                                      | forte résistance, Ampco                             | 300            | 1013                               | N10               | -                           | -                 | -               |  |
|   |  | Thermoplaste (sans agents de charge abrasives)      | -              | -                                  | N11               | -                           | -                 | -               |  |
|   |  | Duroplaste (sans agents de charge abrasives)        | -              | -                                  | N12               | -                           | -                 | -               |  |
|   |  | Matière plastique renforcée de fibres de verre GFRP | -              | -                                  | N13               | -                           | -                 | -               |  |
| Matière plastique renforcé composite CFRP |  | -   | -              | N14                                | -                 | -                           | -                 |                 |  |
| Plastique renforcé fibre aramide AFRP     |  | -   | -              | N15                                | -                 | -                           | -                 |                 |  |
| <b>S</b>                                  | Alliages réfractaires  | Graphite  | 80 Shore       | -                                  | N16               | -                           | -                 | -               |  |
|   |  | à base de Fe recuit                                 | 200            | 675                                | S1                | -                           | 20 - 35 - 50      | 20 - 35 - 50    |  |
|   |  | à base de Fe durci                                  | 280            | 943                                | S2                | -                           | 20 - 35 - 50      | 20 - 30 - 40    |  |
|   |  | à base Ni ou Co recuit                              | 250            | 839                                | S3                | -                           | 15 - 30 - 40      | 15 - 20 - 25    |  |
|   |  | à base Ni ou Co durci                               | 350            | 1177                               | S4                | -                           | 15 - 25 - 30      | -               |  |
|   | Alliage de titane  | à base Ni ou Co jeter                               | 320            | 1076                               | S5                | -                           | 15 - 25 - 30      | -               |  |
|   |  | Titane pur  | 200            | 675                                | S6                | -                           | -                 | 50 - 85 - 120   |  |
|   |  | Alliages Alpha + Beta, trempé                       | 375            | 1262                               | S7                | -                           | -                 | 30 - 40 - 50    |  |
|   | Alliage de tungstène   | Alliages Beta                                       | 410            | 1396                               | S8                | -                           | -                 | 30 - 40 - 50    |  |
|   |  |   | 300            | 1013                               | S9                | -                           | -                 | -               |  |
| Alliage de molybdène                      |  | 300   | 1013           | S10                                | -                 | -                           | -                 |                 |  |
| <b>H</b>                                  | Acier trempé   | trempe et revenu                                    | 50 HRC         | -                                  | H1                | -                           | -                 | -               |  |
|   |  | trempe et revenu                                    | 55 HRC         | -                                  | H2                | -                           | -                 | -               |  |
|   |  | trempe et revenu                                    | 60 HRC         | -                                  | H3                | -                           | -                 | -               |  |
|   | Fonte durci  | trempe et revenu                                    | 55 HRC         | -                                  | H4                | -                           | -                 | -               |  |

Les données affichées dans le tableau sont des valeurs approximatives.

Il peut être nécessaire de les adapter à des applications d'usinage individuelles.

HC = Carbure avec revêtement

HU = Carbure sans revêtement

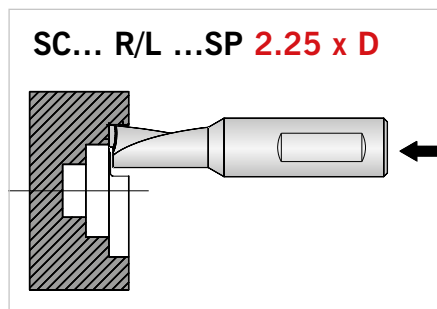


# RECOMMENDED CUTTING DATA – APPLICATIONS

## VALORI DI TAGLIO RACCOMANDATI - APPLICAZIONI

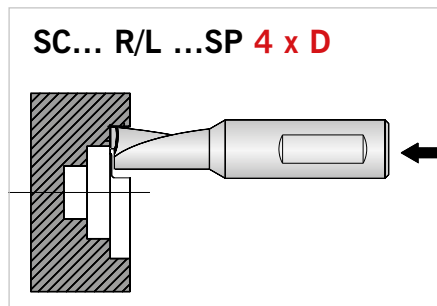
## VALEURS DE COUPE RECOMMANDÉES – APPLICATIONS

### Boring / Barenatura / Décolletage



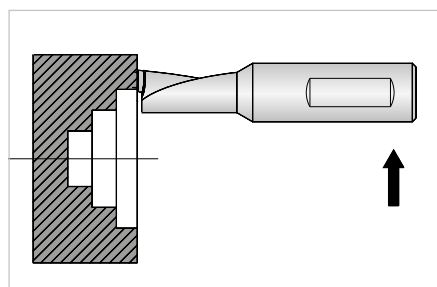
| SHARK-Cut® Ø [mm]  | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |      |
|--|--|------|------|------|------|------|------|------|
|  | 0.5  | 1    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4    |
| Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr] |  |      |      |      |      |      |      |      |
| SC04   | 0.10   | 0.10 | 0.08 | 0.05 | -    | -    | -    | -    |
| SC05   | 0.10   | 0.10 | 0.09 | 0.06 | 0.04 | -    | -    | -    |
| SC06   | 0.10   | 0.10 | 0.10 | 0.08 | 0.06 | 0.04 | -    | -    |
| SC07   | 0.10   | 0.10 | 0.10 | 0.10 | 0.08 | 0.06 | 0.04 | -    |
| SC08   | 0.10   | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 | 0.06 | 0.04 |

### Boring / Barenatura / Décolletage



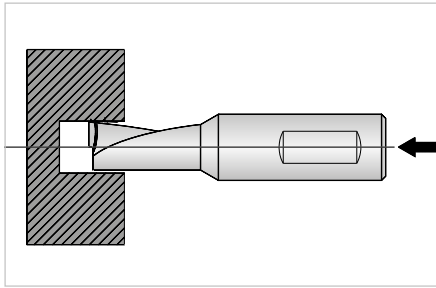
| SHARK-Cut® Ø [mm]  | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |       |       |       |       |
|--|--|------|-------|-------|-------|-------|
|  | 0.5  | 1    | 1.5   | 2     | 2.5   | 3     |
| Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr] |  |      |       |       |       |       |
| SC04   | 0.10   | 0.08 | 0.050 | -     | -     | -     |
| SC05   | 0.10   | 0.09 | 0.060 | 0.040 | -     | -     |
| SC06   | 0.10   | 0.09 | 0.060 | 0.040 | -     | -     |
| SC07   | 0.10   | 0.10 | 0.080 | 0.060 | 0.040 | -     |
| SC08   | 0.10   | 0.10 | 0.085 | 0.075 | 0.055 | 0.040 |

### Facing / Tornitura in piano / Dressage de face



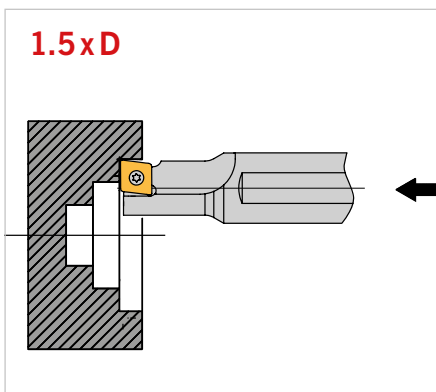
| SHARK-Cut® Ø [mm] | SC...R/L...SP (2.25 x D) |          | SC...R/L...SP-ALU (4 x D) |          |
|-------------------|--------------------------|----------|---------------------------|----------|
|                   | ap [mm]                  | f [mm/r] | ap [mm]                   | f [mm/r] |
| SC04              | 0.7                      | 0.07     | 0.7                       | 0.05     |
| SC05              | 0.7                      | 0.07     | 0.7                       | 0.05     |
| SC06              | 0.7                      | 0.07     | 0.7                       | 0.05     |
| SC07              | 1.0                      | 0.08     | 1.0                       | 0.06     |
| SC08              | 1.0                      | 0.08     | 1.0                       | 0.06     |

**Drilling / Foratura / Alésage**



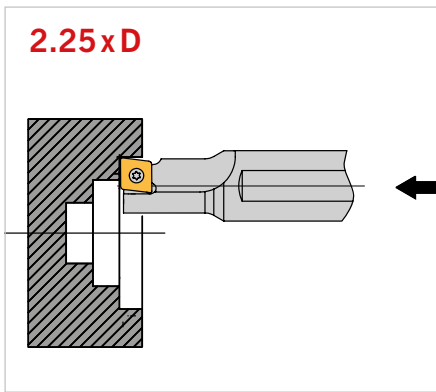
| SHARK-Cut® Ø [mm] | SC...R/L...SP (2.25 x D)        | SC...R/L...SP-ALU (4 x D)       |
|-------------------|---------------------------------|---------------------------------|
|                   | f [mm/r] / f [mm/U] / f [mm/tr] | f [mm/r] / f [mm/U] / f [mm/tr] |
| SC04              | 0.005 – 0.030                   | 0.005 – 0.020                   |
| SC05              | 0.005 – 0.030                   | 0.005 – 0.020                   |
| SC06              | 0.005 – 0.030                   | 0.005 – 0.020                   |
| SC07              | 0.005 – 0.035                   | 0.005 – 0.025                   |
| SC08              | 0.005 – 0.040                   | 0.005 – 0.030                   |

**Boring / Barenatura / Décolletage**



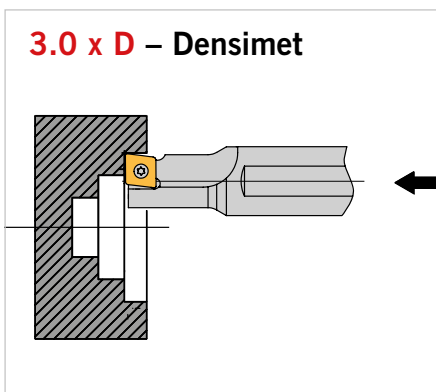
| SHARK-Cut® Ø [mm] | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|------|------|------|------|------|
|                   | 1  | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 12   | 14   |
|                   | Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr]                       |      |      |      |      |      |      |      |      |      |      |      |
| SC08...(LP..04)   | 0.12   | 0.11 | 0.10 | 0.07 | -    | -    | -    | -    | -    | -    | -    | -    |
| SC10...(LP..05)   | 0.15   | 0.15 | 0.12 | 0.10 | 0.09 | -    | -    | -    | -    | -    | -    | -    |
| SC12...(LP..06)   | 0.16   | 0.16 | 0.15 | 0.13 | 0.12 | 0.10 | -    | -    | -    | -    | -    | -    |
| SC14...(LP..07)   | 0.18   | 0.18 | 0.18 | 0.15 | 0.13 | 0.11 | -    | -    | -    | -    | -    | -    |
| SC16...(LP..08)   | 0.20   | 0.20 | 0.20 | 0.19 | 0.17 | 0.15 | 0.14 | 0.12 | -    | -    | -    | -    |
| SC18...(LP..09)   | 0.21   | 0.21 | 0.21 | 0.21 | 0.19 | 0.17 | 0.16 | 0.14 | -    | -    | -    | -    |
| SC20...(LP..10)   | 0.22   | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 | 0.19 | 0.17 | 0.16 | 0.15 | -    | -    |
| SC25...(LP..13)   | 0.26   | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.25 | 0.23 | 0.22 | 0.20 | 0.16 | -    |
| SC32...(LP..17)   | 0.30   | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.28 | 0.27 | 0.25 | 0.17 | 0.18 |

**Boring / Barenatura / Décolletage**



| SHARK-Cut® Ø [mm] | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|
|                   | 1  | 2    | 2.5  | 3    | 3.5  | 4    | 5    |
|                   | Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr]                       |      |      |      |      |      |      |
| SC08...(LP..04)   | 0.12   | 0.09 | 0.07 | -    | -    | -    | -    |
| SC10...(LP..05)   | 0.15   | 0.12 | 0.10 | 0.09 | -    | -    | -    |
| SC12...(LP..06)   | 0.16   | 0.16 | 0.13 | 0.12 | 0.10 | -    | -    |
| SC14...(LP..07)   | 0.18   | 0.18 | 0.16 | 0.14 | 0.11 | -    | -    |
| SC16...(LP..08)   | 0.20   | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | -    |
| SC18...(LP..09)   | 0.21   | 0.21 | 0.20 | 0.18 | 0.16 | 0.14 | -    |
| SC20...(LP..10)   | 0.22   | 0.22 | 0.22 | 0.21 | 0.19 | 0.17 | 0.12 |
| SC25...(LP..13)   | 0.28   | 0.28 | 0.28 | 0.28 | 0.25 | 0.23 | 0.20 |
| SC32...(LP..17)   | 0.30   | 0.30 | 0.30 | 0.30 | 0.28 | 0.28 | 0.25 |

**Boring / Barenatura / Décolletage**



| SHARK-Cut® Ø [mm] | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |
|-------------------|--|------|------|------|------|------|------|
|                   | 1  | 2    | 2.5  | 3    | 3.5  | 4    | 5    |
|                   | Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr]                       |      |      |      |      |      |      |
| SC08...(LP..04)   | 0.12   | 0.09 | 0.07 | -    | -    | -    | -    |
| SC10...(LP..05)   | 0.13   | 0.11 | 0.09 | 0.07 | -    | -    | -    |
| SC12...(LP..06)   | 0.15   | 0.13 | 0.12 | 0.11 | 0.10 | -    | -    |
| SC14...(LP..07)   | 0.16   | 0.16 | 0.15 | 0.13 | 0.11 | -    | -    |
| SC16...(LP..08)   | 0.18   | 0.18 | 0.17 | 0.15 | 0.13 | 0.12 | -    |
| SC18...(LP..09)   | 0.20   | 0.20 | 0.18 | 0.17 | 0.15 | 0.14 | -    |
| SC20...(LP..10)   | 0.22   | 0.22 | 0.22 | 0.21 | 0.19 | 0.16 | 0.14 |
| SC25...(LP..13)   | 0.25   | 0.25 | 0.25 | 0.25 | 0.23 | 0.22 | 0.18 |
| SC32...(LP..17)   | 0.28   | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.22 |



## 3.0 x D – Densimet

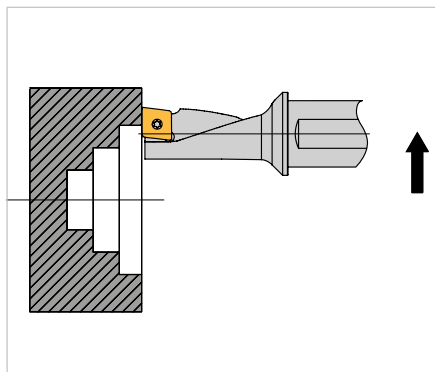
| Material<br>Materiale<br>Matériau | Modulus of elasticity [kg/mm <sup>2</sup> ]<br>Modulo elastico [kg/mm <sup>2</sup> ]<br>Module de Young [kg/mm <sup>2</sup> ] | Density [g/cm <sup>3</sup> ]<br>Densità [g/cm <sup>3</sup> ]<br>Densité [g/cm <sup>3</sup> ] |
|-----------------------------------|---|--|
| Densimet                          | 360   | 17.50  |
| Steel                             | 210   | 7.85   |

**Absolute precision, excellent surface quality and longer tool life are achieved due to the high modulus of elasticity and density. This greatly reduces vibrations.**

*Estrema precisione con eccellente finitura superficiale e durate crescenti vengono ottenute grazie a un modulo elastico e a elevata densità, che hanno un effetto di smorzamento delle oscillazioni.*

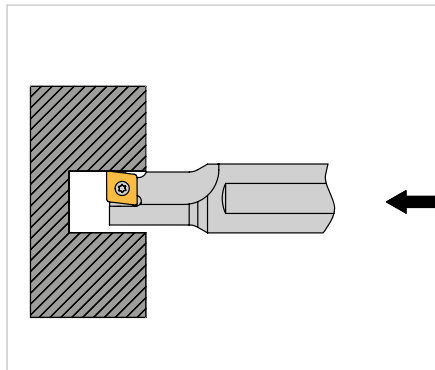
Une précision maximale avec des finitions de surface remarquables et une durée de vie augmentée sont obtenues grâce au module de Young et à la densité élevés, ces derniers amortissant particulièrement bien les vibrations.

## Facing / Tornitura in piano / Dressage de face



| SHARK-Cut® Ø [mm] | 1.5xD   |          | 2.25xD  |          | 3 x D – Densimet |          |
|-------------------|---------|----------|---------|----------|------------------|----------|
|                   | ap [mm] | f [mm/r] | ap [mm] | f [mm/r] | ap [mm]          | f [mm/r] |
| SC08...(LP...04)  | 2.00    | 0.10     | 1.50    | 0.07     | 1.00             | 0.10     |
| SC10...(LP...05)  | 2.50    | 0.12     | 2.00    | 0.12     | 1.20             | 0.12     |
| SC12...(LP...06)  | 3.00    | 0.15     | 2.50    | 0.14     | 1.50             | 0.15     |
| SC14...(LP...07)  | 3.50    | 0.16     | 3.00    | 0.15     | 1.70             | 0.16     |
| SC16...(LP...08)  | 4.00    | 0.17     | 3.50    | 0.16     | 2.00             | 0.17     |
| SC18...(LP...09)  | 5.00    | 0.18     | 3.50    | 0.17     | 2.30             | 0.18     |
| SC20...(LP...10)  | 5.00    | 0.20     | 4.00    | 0.18     | 2.50             | 0.20     |
| SC25...(LP...13)  | 6.00    | 0.24     | 5.00    | 0.22     | 3.00             | 0.24     |
| SC32...(LP...17)  | 8.00    | 0.27     | 6.00    | 0.26     | 3.50             | 0.27     |

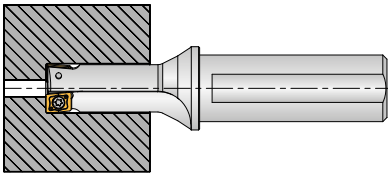
## Drilling / Foratura / Alésage



| SHARK-Cut® Ø [mm] | 1.5 - 2.25 x D | 3 x D – Densimet |
|-------------------|----------------|------------------|
|                   | f [mm/r]       | f [mm/r]         |
| SC08...(LP...04)  | 0.01–0.04      | 0.01–0.02        |
| SC10...(LP...05)  | 0.01–0.05      | 0.01–0.03        |
| SC12...(LP...06)  | 0.01–0.05      | 0.01–0.04        |
| SC14...(LP...07)  | 0.01–0.07      | 0.01–0.05        |
| SC16...(LP...08)  | 0.02–0.08      | 0.02–0.06        |
| SC18...(LP...09)  | 0.03–0.09      | 0.03–0.07        |
| SC20...(LP...10)  | 0.03–0.10      | 0.03–0.08        |
| SC25...(LP...13)  | 0.03–0.12      | 0.04–0.09        |
| SC32...(LP...17)  | 0.05–0.15      | 0.05–0.11        |

Boring

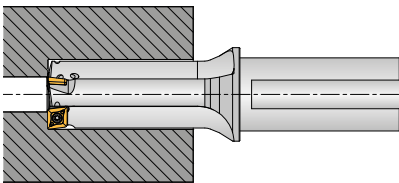
**2-fluted**  
a 2 taglienti  
à 2 dents



| SHARK-Cut® Rebore<br>Ø [mm]                                  | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |      |      |      |      |      |   |
|--|--|------|------|------|------|------|------|------|------|------|------|------|---|
|  | 1  | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 12   | 14   |   |
| Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr] |  |      |      |      |      |      |      |      |      |      |      |      |   |
| 12 - 15 (LP..04)   | 0.25   | 0.22 | 0.20 | 0.16 | -    | -    | -    | -    | -    | -    | -    | -    | - |
| 16 - 17.5 (LP..05)   | 0.30   | 0.30 | 0.28 | 0.24 | 0.20 | -    | -    | -    | -    | -    | -    | -    | - |
| 18 - 19 (LP..06)   | 0.34   | 0.34 | 0.34 | 0.30 | 0.25 | 0.20 | -    | -    | -    | -    | -    | -    | - |
| 20 - 23 (LP..07)   | 0.36   | 0.36 | 0.36 | 0.33 | 0.30 | 0.26 | 0.22 | -    | -    | -    | -    | -    | - |
| 24 - 25(LP..08)  | 0.42   | 0.42 | 0.42 | 0.42 | 0.38 | 0.34 | 0.30 | 0.25 | -    | -    | -    | -    | - |
| 26 - 28 (LP..09)   | 0.44   | 0.44 | 0.44 | 0.44 | 0.44 | 0.40 | 0.35 | 0.32 | 0.28 | -    | -    | -    | - |
| 29 - 24(LP..10)  | 0.48   | 0.48 | 0.48 | 0.48 | 0.48 | 0.45 | 0.40 | 0.36 | 0.32 | 0.30 | -    | -    | - |
| 35 - 44 (LP..13)   | 0.52   | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.50 | 0.47 | 0.43 | 0.38 | 0.30 | -    | - |
| 45 - 50 (LP..17)   | 0.60   | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.55 | 0.50 | 0.42 | 0.35 | - |

Boring

**3-fluted**  
a 3 taglienti  
à 3 dents



| SHARK-Cut® Rebore<br>Ø [mm]                                  | Cutting depth ap [mm] / Profondità di taglio ap [mm] / Profondeur de passe ap [mm] |      |      |      |      |      |      |      |      |      |      |    |   |
|--|--|------|------|------|------|------|------|------|------|------|------|----|---|
|  | 1  | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 12   | 14 |   |
| Feed rate f [mm/r] / Avanzamento f [mm/U] / Avance f [mm/tr] |  |      |      |      |      |      |      |      |      |      |      |    |   |
| 24 - 25 (LP..06)   | 0.51   | 0.51 | 0.51 | 0.45 | 0.38 | 0.30 | -    | -    | -    | -    | -    | -  | - |
| 26 - 28 (LP..07)   | 0.54   | 0.54 | 0.54 | 0.49 | 0.45 | 0.39 | 0.33 | -    | -    | -    | -    | -  | - |
| 29 - 34 (LP..08)   | 0.63   | 0.63 | 0.63 | 0.63 | 0.57 | 0.51 | 0.45 | 0.38 | -    | -    | -    | -  | - |
| 35 - 40 (LP..09)   | 0.66   | 0.66 | 0.66 | 0.66 | 0.66 | 0.60 | 0.53 | 0.48 | 0.42 | -    | -    | -  | - |
| 41 - 47 (LP..10)   | 0.72   | 0.72 | 0.72 | 0.72 | 0.72 | 0.68 | 0.60 | 0.54 | 0.48 | 0.45 | -    | -  | - |
| 48 - 50 (LP..13)   | 0.78   | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.75 | 0.70 | 0.65 | 0.57 | 0.45 | -  | - |



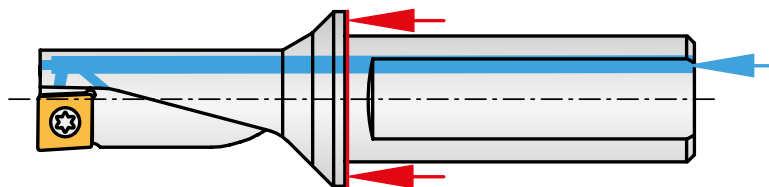
## MAXIMUM DRILLING DEPTH

### MASSIMA PROFONDITÀ DI FORATURA

### PROFONDEURS DE TROU MAXIMALES

| SHARK-Cut® Ø [mm] | Mini (2.25 x D)<br>[mm] | Mini ALU (4 x D)<br>[mm] | 1.5xD<br>[mm] | 2.25xD<br>[mm] | 3xD<br>[mm] |
|-------------------|-------------------------|--------------------------|---------------|----------------|-------------|
| 4                 | 9.00                    | 16                       | -             | -              | -           |
| 5                 | 11.25                   | 20                       | -             | -              | -           |
| 6                 | 13.50                   | 24                       | -             | -              | -           |
| 7                 | 15.75                   | 28                       | -             | -              | -           |
| 8                 | 18.00                   | 32                       | 12            | 18.0           | 24          |
| 10                | -                       | -                        | 15            | 22.0           | 30          |
| 12                | -                       | -                        | 18            | 27.0           | 36          |
| 14                | -                       | -                        | 21            | 31.5           | 42          |
| 16                | -                       | -                        | 24            | 36.0           | 48          |
| 18                | -                       | -                        | 27            | 40.5           | 54          |
| 20                | -                       | -                        | 30            | 45.0           | 60          |
| 25                | -                       | -                        | 38            | 56.0           | 75          |
| 32                | -                       | -                        | 48            | 72.0           | 96          |

## COOLANT BOOSTER



### Through tool coolant (coolant booster)

Adduzione interna del liquido refrigerante (Coolant Booster)  
Arrivée interne de liquide de refroidissement (Coolant-Booster)

### Axial location flat (for better stability)

Impianto assiale (stabilità)  
Support axial (stabilité)

### Coolant pressure

The SHARK-Cut® tool offers a unique solution when it comes to coolant supply to improve chip evaluation out of the bored hole. A “return” coolant jet (in the reverse flute direction) ensures enhanced chip evacuation. The coolant pressure is therefore approx. 1.5 – 3 bar (ideally 5 – 7 bar).

### Pressione del refrigerante

Questa soluzione innovativa in dettaglio SHARK-Cut® offre una speciale adduzione del liquido refrigerante per una asportazione migliore dei trucioli da foratura. Un getto di refrigerante rivolto all'indietro garantisce il trasporto ottimizzato dei trucioli. Indipendentemente dal diametro, la pressione del refrigerante deve per questo essere di circa 1,5 – 3 bar (ottimale 5 – 7 bar).

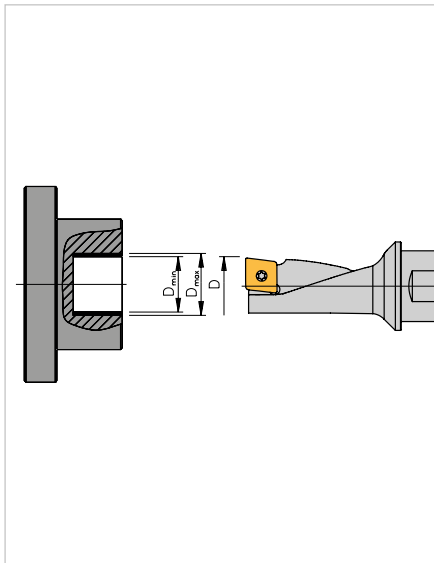
### Pression de liquide de refroidissement

Le SHARK-Cut®, en tant que solution innovante, offre une arrivée de liquide de refroidissement spécifique pour une meilleure évacuation des copeaux du perçage. Un jet de liquide de refroidissement distinct dirigé vers l'arrière optimise l'évacuation des copeaux. Pour cela, la pression de liquide de refroidissement doit être d'environ 1,5 à 3 bar (idéalement 5 à 7 bar), indépendamment du diamètre.

# DRILLING OFF-CENTRE

## FORATURA FUORI CENTRO

## ALÉSAGE EXCENTRÉ



**Tool type**  
Tipo di utensile  
Type d'outil

**Nominal tool diameter**  
Diametro nominale utensile  
Diamètre nominal de l'outil

**Drilling diameter**  
Diametro di foratura utensile  
Diamètre de perçage de la pièce

|                          | D [mm] | D <sub>min</sub> [mm] | D <sub>max</sub> [mm] |
|--------------------------|--------|-----------------------|-----------------------|
| SC 04 R/L-...SP...(Mini) | 4      | 3.90                  | 4.2                   |
| SC 05 R/L-...SP...(Mini) | 5      | 4.90                  | 5.2                   |
| SC 06 R/L-...SP...(Mini) | 6      | 5.90                  | 6.2                   |
| SC 07 R/L-...SP...(Mini) | 7      | 6.90                  | 7.2                   |
| SC 08 R/L-...SP...(Mini) | 8      | 7.90                  | 8.2                   |
| SC 08 R/L-...04          | 8      | 7.85                  | 8.3                   |
| SC 10 R/L-...05          | 10     | 9.85                  | 10.5                  |
| SC 12 R/L-...06          | 12     | 11.85                 | 12.5                  |
| SC 14 R/L-...07          | 14     | 13.85                 | 14.5                  |
| SC 16 R/L-...08          | 16     | 15.85                 | 16.5                  |
| SC 18 R/L-...09          | 18     | 17.85                 | 18.5                  |
| SC 20 R/L-...10          | 20     | 19.80                 | 20.5                  |
| SC 25 R/L-...13          | 25     | 24.80                 | 25.8                  |
| SC 32 R/L-...17          | 32     | 31.80                 | 33.0                  |

**The matching specially designed designs of the tool and insert permits off-centre drilling. This allows deviations in tool diameter.**

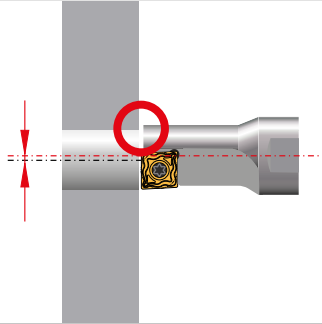
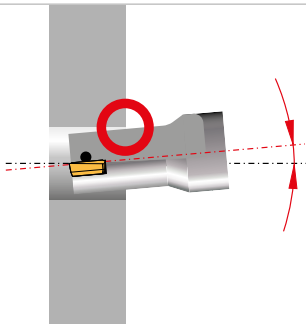
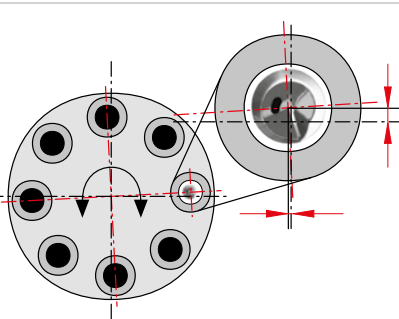
*Grazie ai modelli appositamente sviluppati e coordinati dell'utensile e dell'inserto è possibile effettuare la foratura fuori centro. In questo modo possono essere raggiunti scostamenti dal diametro dell'utensile.*

La conception spécialement développée et coordonnée de l'outil et de la plaquette de coupe amovible permet de réaliser des perçages excentrés. On peut ainsi obtenir des écarts par rapport au diamètre de l'outil.

## MACHINE AXIS OFFSET

### SPOSTAMENTO ASSE DELLA MACCHINA

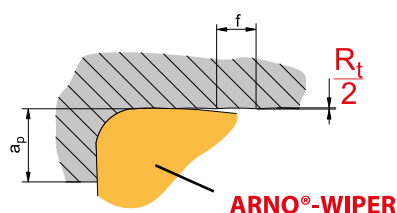
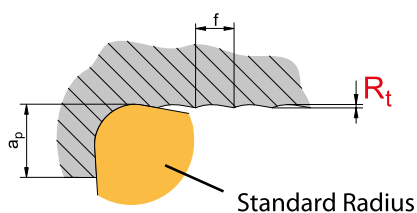
### DÉCALAGE AXIAL DE LA MACHINE

|  |   |  |
|--|---|--|
| <p><b>Situation</b><br/><i>Situazione</i><br/>Situation</p> <p><b>Offset in X direction</b><br/><i>Spostamento in direzione X</i><br/>Décalage dans le sens X</p>                        |   | <p><b>Solution</b><br/><i>Soluzione</i><br/>Solution</p> <p><b>Correct tool position</b><br/><i>Regolare correzione utensile</i><br/>Ajuster la correction d'outil</p>                     |
| <p><b>Situation</b><br/><i>Situazione</i><br/>Situation</p> <p><b>Angle error</b><br/><i>Errore angolare</i><br/>Erreur angulaire</p>  |  | <p><b>Solution</b><br/><i>Soluzione</i><br/>Solution</p> <p><b>Adjust turret and/or spindle</b><br/><i>Allineare revolver e/o fantina</i><br/>Aligner la tourelle ou la broche</p>         |
| <p><b>Situation</b><br/><i>Situazione</i><br/>Situation</p> <p><b>Turret position error</b><br/><i>Errore di posizionamento revolver</i><br/>Erreur de positionnement de la tourelle</p> |  | <p><b>Solution</b><br/><i>Soluzione</i><br/>Solution</p> <p><b>Adjust turret plate (Y axis)</b><br/><i>Allineare disco revolver (Asse Y)</i><br/>Aligner le disque de tourelle (axe Y)</p> |

## WIPER GEOMETRY – FUNCTION PRINCIPLE (BENEFITS)

### GEOMETRIA WIPER – PRINCIPIO DI FUNZIONAMENTO (BENEFICI)

### GÉOMÉTRIE WIPER – PRINCIPE DE FONCTIONNEMENT (BÉNÉFICES)



#### Better surface quality

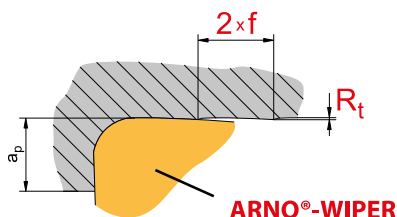
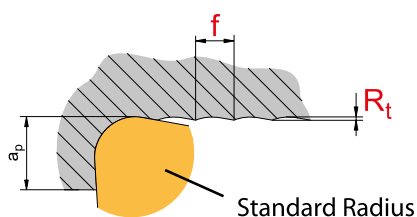
At the same feed rate the indexable insert with WIPER insert achieves a Ra value that is much better than a conventional indexable insert.

#### Superficie migliore

Con pari avanzamento, l'inserto con tagliente WIPER raggiunge un valore Ra di gran lunga migliore rispetto a un inserto tradizionale.

#### Meilleur qualité de l'état de surface

À vitesse égale, la plaquette de coupe amovible avec plat WIPER obtient une valeur Ra bien supérieure à celle obtenue par une plaquette de coupe amovible traditionnelle.



#### Shorter machine time

If the same Ra value is to be achieved as with a standard indexable insert, the insert with a WIPER flute is capable at operating at twice the feed rate, thereby reducing machine time.

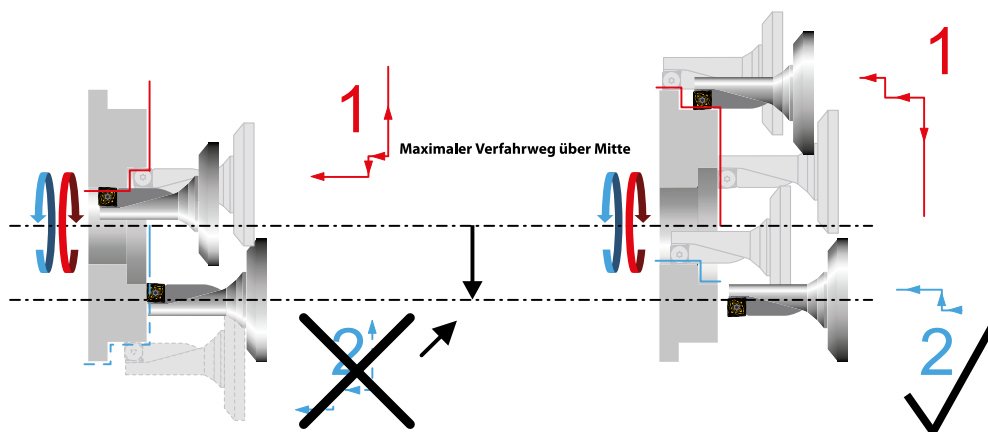
#### Tempo di lavorazione ridotto

Se si deve ottenere lo stesso valore Ra di un inserto standard, grazie all'inserto con tagliente WIPER è possibile utilizzare un avanzamento doppio (= tempi di lavorazione pezzo ridotti!).

#### Temps d'usinage réduit

S'il faut atteindre la même valeur Ra qu'avec une plaquette de coupe amovible standard, la plaquette de coupe avec plat WIPER permet d'utiliser à une avance deux fois plus élevée (= durée d'usinage réduite !).

## MACHINING OVER CENTRE LAVORAZIONE SOPRA CENTRO USINAGE AU-DELÀ DU CENTRE



### Situation

If machine travel over the centre is insufficient, the outside diameter cannot be machined with the same tool.

### Solution

Use of a right-hand SHARK-Cut® tool.

### Situazione

Se la corsa della macchina sull'asse centrale è insufficiente, il diametro esterno non può essere lavorato con lo stesso utensile.

### Soluzione

Utilizzo di un utensile SHARK-Cut® destro.

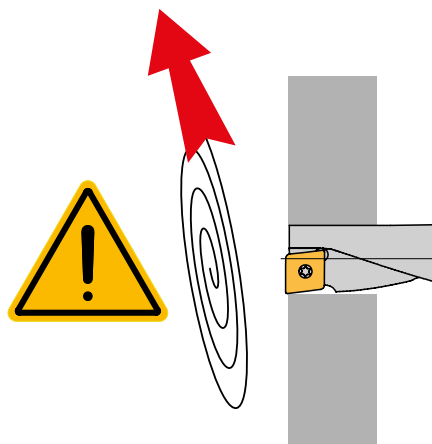
### Situation

Si le déplacement de la machine au-dessus de l'axe central est insuffisant, le diamètre extérieur ne peut pas être usiné avec le même outil.

### Solution

Utiliser le bon outil SHARK-Cut®.

## THROUGH HOLE DRILLING FORO PASSANTE PERÇAGE TRAVERSANT



### Note

When through holes are drilled with a stationary tool and a rotating workpiece, a sharp-edged disc is produced. Please ensure adequate safety precautions.

The coolant pressure for SHARK-Cut® 2.25 x D should be approx. 5–7 bar and approx 1.5–3 bar for SHARK-Cut® 1.5 x D. If the required coolant pressure is not available on the machine, it may be beneficial to interrupt the drilling operation briefly to evacuate the hole.

### Nota

Con l'utensile fisso e il pezzo in lavorazione rotante nei fori passanti si produce un bordo tagliente. Adottare le opportune misure di sicurezza.

La pressione del refrigerante per SHARK-Cut® 2,25 x D dovrebbe essere di ca. 5–7 bar e di ca. 1,5–3 bar per SHARK-Cut® 1,5 x D. Se sul lato macchina non è presente la pressione del refrigerante necessaria, può essere utile interrompere brevemente il procedimento di foratura per poter svuotare il foro.

### Remarque

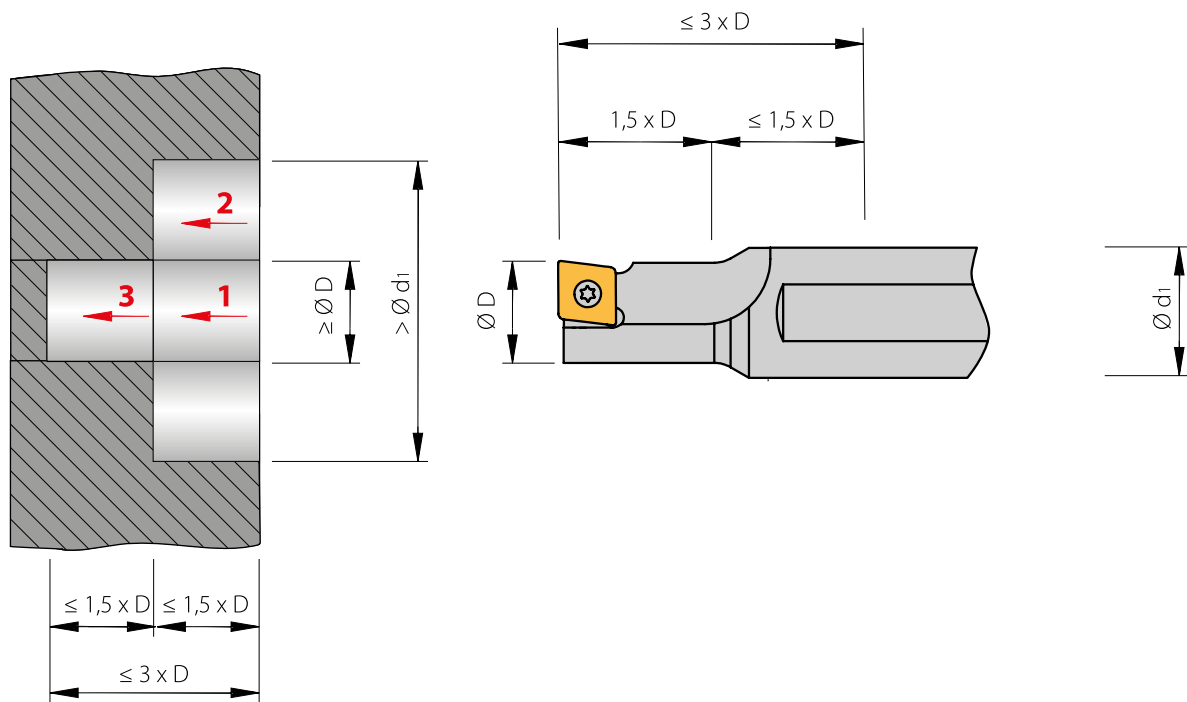
Si l'outil est à l'arrêt et si la pièce tourne, dans le cas de perçage traversant, une rondelle tranchante tombe, il faut prendre des mesures de sécurité.

La pression de liquide de refroidissement doit être d'env. 5 à 7 bar pour le SHARK-Cut® 2,25 x D et d'env. 1,5 à 3 bar pour le SHARK-Cut® 1,5 x D. Si la machine ne permet pas d'obtenir la pression de liquide de refroidissement nécessaire, il peut être judicieux d'interrompre brièvement l'opération de perçage pour vider le trou.

## DRILLING DEPTHS UP TO 3 X D

### PROFONDITÀ DI FORATURA FINO A 3 X D

### PROFONDEURS DE TROU JUSQU'À 3 X D



With SHARK-Cut® tools SC..1.5 x D, drilling depths up to three times the nominal diameter are achievable with a corresponding workpiece contour (see Figure). Not the work steps 1, 2 and 3. Use right-hand and left-hand indexable inserts for tools with a diameter of 8 mm. Use neutral indexable inserts for tools with diameters ranging from 10 to 32 mm.

Con gli utensili SHARK-Cut® SC..1.5 x D con un corrispondente profilo dell'utensile è possibile ottenere profondità di foratura fino al triplo del diametro nominale (vedere immagine). A tale proposito è necessario attenersi alla sequenza operativa 1, 2 e 3. Per utensili con diametro di 8 mm sono necessari inserti destri e sinistri. Per utensili con diametro da 10 a 32 mm vengono utilizzati inserti neutri.

Les outils SHARK-Cut® SC..1.5 x D permettent d'obtenir, à contour de pièce correspondant, des profondeurs de trou jusqu'à trois fois le diamètre nominal (voir illustration). À cet effet, il convient de respecter la séquence des opérations 1, 2 et 3. Pour les outils dont le diamètre mesure 8 mm, des plaquettes de coupe amovibles droites et gauches sont nécessaires. Pour les outils dont le diamètre mesure 10 à 32 mm, des plaquettes de coupe amovibles neutres sont utilisées.

# BORING TOOL WITH 2 OR 3 FLUTES

## UTENSILE PER LA FORATURA CON 2 O 3 TAGLIENTI

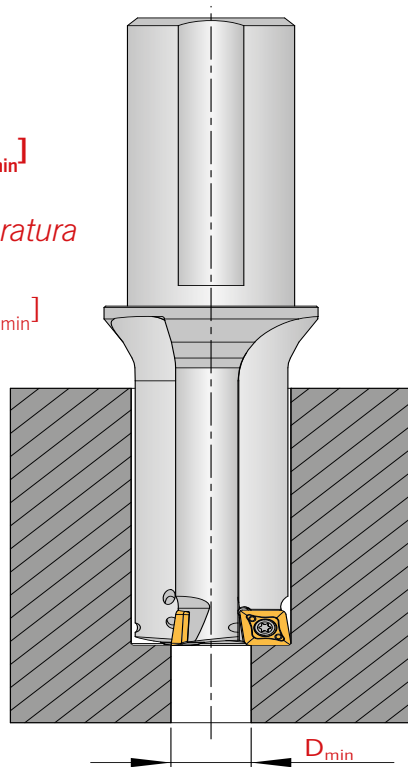
### OUTIL DE PERÇAGE AVEC 2 OU 3 DENTS



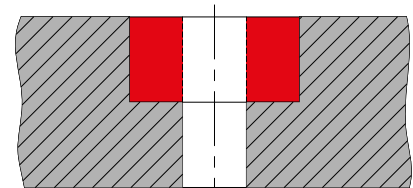
**Preboring [Ø D<sub>min</sub>] necessary!**

*Necessaria preforatura [Ø D<sub>min</sub>]!*

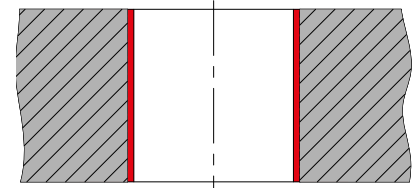
*Préperçage [Ø D<sub>min</sub>] nécessaire !*



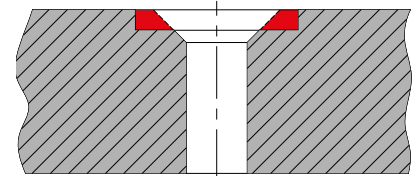
**Counter boring**  
*Lamatura*  
*Lamage*



**Boring**  
*Alesaggio*  
*Perçage*



**Spot facing**  
*Profili a tuffo*  
*Dégagement*



## EQUATIONS / FORMULE / FORMULES

**Cutting speed**  
*Velocità di taglio*  
*Vitesse de coupe*

$$V_c = \frac{\pi \cdot D \cdot n}{1000}$$

**RPM**  
*Numero di giri*  
*Vitesse de rotation*

$$n = \frac{V_c \cdot 1000}{\pi \cdot D}$$

**Chip removal rate**  
*Volume di truciolatura*  
*Volume d'enlèvement de copeaux*

$$Q = V_c \cdot a_p \cdot f_n$$

**D diameter** [mm]  
*Diametro*  
*Diamètre*

**f<sub>n</sub> feed rate per revolution** [mm/r]  
*Avanzamento per giro* [mm/giro]  
*Avance par rotation* [mm/tr]

**n spindle speed** [rpm]  
*Numero di giri mandrino* [giri/min]  
*Vitesse de rotation de broche* [tr/min]

**V<sub>c</sub> cutting speed** [m/min]  
*Velocità di taglio*  
*Vitesse de coupe*

**a<sub>p</sub> cutting depth** [mm]  
*Profondità di taglio*  
*Profondeur de coupe*

**Q chip removal rate** [cm<sup>3</sup>/min]  
*Volume di truciolatura*  
*Volume d'enlèvement de copeaux*

| Application problem<br>Problema di applicazione<br>Problème d'application |   |   |   |  |  |  |  | Corrective measures<br>Rimedio<br>Mesure corrective             | Criteria<br>Criterio<br>Critère                               |
|---|---|---|---|--|--|--|--|---|---|
| Edge chipping<br>Scheggiature<br>Éclatements                              | Edge build-up<br>Tagliente riportato<br>Arête rapportée | Clearance face wear<br>Usura superfici di spoglia<br>Usure en dépeuille | Plastic deformation<br>Deformazione plastica<br>Déformation plastique | Vibrations<br>Vibrazioni<br>Vibrations | Surface finish<br>Finitura superficiale<br>Etat de surface | Chip too long<br>Truciolo troppo lungo<br>Copeau trop long | Chip too short<br>Truciolo troppo corto<br>Copeau trop court |   |   |
|   | ↑   | ↓   | ↓   | ↓                                      | ↑  | ↓  |  | Cutting speed<br>Velocità di taglio<br>Vitesse de coupe         | Cutting data<br>Valori di taglio<br>Valeurs de coupe          |
| ↓   |   | ~   | ↓   | ↑                                      | ↓  | ↑  | ↓  | Feed rate<br>Avanzamento<br>Avance                              |   |
| ↑   |   | ↑   | ↑   | ↓                                      | ↑  |  |  | Corner radius<br>Raggio di punta<br>Rayon                       | Indexable inserts<br>Inserti<br>Plaquettes de coupe amovibles |
| ↓   |   | ↑   | ↑   |  |  |  |  | Cutting material<br>Materiale da taglio<br>Nuance de coupe      |   |
| ~   |   |   |   | ~                                      | ~  |  |  | Tool clamping<br>Bloccaggio utensile<br>Fixation de l'outil     | General criteria<br>Criteri generali<br>Critères généraux     |
| ~   |   |   |   | ~                                      | ~  |  |  | Workpiece clamping<br>Staffaggio pezzo<br>Fixation de la pièce  |   |
| ~   |   |   |   | ~                                      | ↓  |  |  | Overhang<br>Sporgenza<br>Porte-à-faux                           |   |
| ~   |   | ~   |   | ~                                      | ~  |  |  | Tip height<br>Altezza delle punte<br>Hauteur de pointe          |   |
|   | ●   | ●   | ●   |  | ●  | ●  |  | Lubricoolant<br>Lubrorefrigerante<br>Liquide de refroidissement |   |



**increase, enlarge – greater effect**  
 aumentare, ingrandire – incide notevolmente  
 augmenter influence majeure



**lower, reduce – greater effect**  
 abbassare, ridurre – incide notevolmente  
 abaisser, réduire influence majeure



**increase, enlarge – smaller effect**  
 aumentare, ingrandire – incide leggermente  
 augmenter influence mineure



**lower, reduce – smaller effect**  
 abbassare, ridurre – incide leggermente  
 abaisser, réduire influence mineure



**apply**  
 utilizzare  
 utiliser



**check, optimise**  
 controllare, ottimizzare  
 contrôler, optimiser



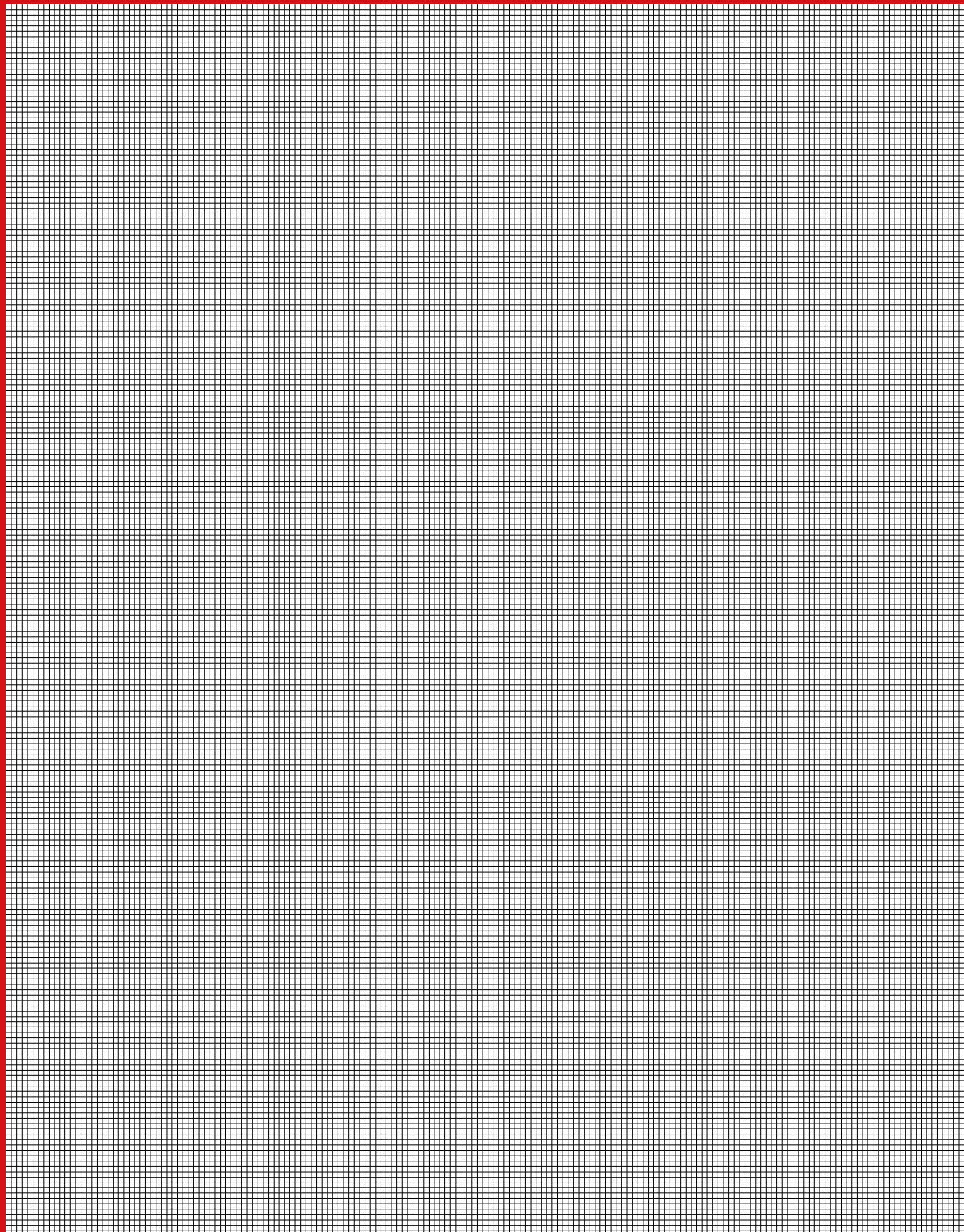
**For more information see**

*Per maggiori informazioni visita il sito*

Vous trouverez de plus amples informations sur



[www.arno.de](http://www.arno.de)



# THREAD TURNING

## Thread turning

- System presentation
- Tool selection
- Thread types
- ISO tool holders
- Boring bars
- Thread holders on KMH tool holders (VDI)
- Inserts
- Recommended cutting data
- Application notes

## Filettatura

- *Presentazione del sistema*
- *Selezione dell'utensile*
- *Tipi di filettatura*
- *Adattatore ISO*
- *Bareni*
- *Supporto filettatura su portautensili KMH (VDI)*
- *Inserti*
- *Valori di taglio consigliati*
- *Suggerimenti tecnici*

## Filetage

- Présentation du système
- Choix d'outils
- Types de filetage
- Support de serrage ISO
- Barres d'alésage
- Supports de filetage sur supports d'outils KMH (VDI)
- Inserts de coupe
- Valeurs de coupe recommandées
- Consignes d'utilisation

630 – 631

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645 – 655

656 – 659

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708 – 713

714 – 727



# 9

# ONLY THE BEST FOR HIGH FLYERS

## LA SOLUZIONE MIGLIORE PER AZIENDE DI SUCCESSO

## LE MEILLEUR POUR LES CONFIRMÉS

**Reliable and versatile: the ARNO system for thread turning. For all thread types, pitches and dimensions starting at a core diameter of 3.2 mm.**

Very high quality, process reliability and versatility: you can rely on all this with the ARNO thread turning system. With the typical ARNO quality down to the smallest detail, you benefit from long tool life and precision. All your operations will run perfectly right from the start with the right tool holders, boring bars and support pads: internal and external threads, round threads, Whitworth and tapered threads.

*Affidabile e versatile: il sistema ARNO per la lavorazione di tutti i tipi di filettatura, di passi e dimensioni a partire da un diametro di nocciolo di 3,2 mm.*

*Massima qualità, affidabilità di processo e versatilità: potrà contare sul sistema ARNO per la filettatura. Grazie alla qualità tipica di ARNO fino all'ultimo dettaglio lunga durata e massima precisione sono a portata di mano. Tornitura interna o esterna, filettatura trapezia o tonda, filettatura gas Whitworth oppure conica – con i relativi portainseriti, barenì, inserti e supporti riesce tutto al primo tentativo.*

**Fiable et polyvalent : le système ARNO pour tous les types de filetage, de pas et de dimensions à partir d'un diamètre central de 3,2 mm.**

Qualité maximale, sécurité du processus et polyvalence : vous pouvez faire confiance au système ARNO pour vos opérations de filetage. Grâce à la qualité typique d'ARNO jusque dans les détails, vous profitez d'une durée de vie élevée et d'une grande précision. Qu'il s'agisse de filetage intérieur ou extérieur, de filetage trapézoïdal ou rond, de filetage Whitworth ou tubulaire – grâce aux supports de serrage, barres d'alésage, plaquettes de coupe et cales-supports appropriés, vous réussirez toutes vos opérations.



### Indexable inserts / Inserti / Inserti

- Standard geometry for 3 flutes for all thread profiles
- Mini 6K... with 3 flutes for internal machining of small diameters greater than 9.3 mm
- Mini 5LK... With 2 flutes for internal machining of small diameters greater than 7.3 mm
- ..UE.. geometry with 3 flutes, extremely rigid for threads with coarse pitches
- ..VE.. geometry with 3 flutes, perpendicular, for machining large profiles, for pitches of 6-10 mm and external back turning
- Versione standard con 3 taglienti per tutti i profili di filettatura
- Mini 6K con 3 taglienti per la lavorazione interna di piccoli diametri a partire da 9,3 mm
- Mini 5LK con 2 taglienti per la lavorazione interna di piccoli diametri a partire da 7,3 mm
- Versione UE con 3 taglienti, particolarmente stabile per filettatura con passi grandi
- Versione VE con 3 taglienti, in verticale per la lavorazione di profili di grandi dimensioni, con passi da 6 a 10 mm e per la lavorazione esterna posteriormente al collare
- Versione standard con 3 taglienti per tutti i profili di filettatura
- Mini 6K con 3 taglienti per la lavorazione interna di piccoli diametri a partire da 9,3 mm
- Mini 5LK con 2 taglienti per la lavorazione interna di piccoli diametri a partire da 7,3 mm
- Versione UE con 3 taglienti, particolarmente stabile per filettatura con passi grandi
- Versione VE con 3 taglienti, in verticale per la lavorazione di profili di grandi dimensioni, con passi da 6 a 10 mm e per la lavorazione esterna posteriormente al collare

## Tool holders / Portainseriti / Support de serrage

- Standard geometry for all thread profiles / ..UE.. geometry for more rigid indexable inserts / ..VE.. geometry for perpendicular indexable inserts
- Available with or without through tool cooling
- Sizes from 8 x 8 to 50 x 50 mm
- Versione standard per tutti i profili di filettatura / versione UE per inserti più stabili / versione VE per inserti verticali
- Disponibili con e senza adduzione interna refrigerante
- Misure da 8 x 8 a 50 x 50 mm Version standard pour tous les profils de filetage / version ..UE.. pour plaquettes de coupe amovibles plus stables / version ..VE.. pour plaquettes de coupe amovibles posées verticalement
- Disponible avec et sans refroidissement interne
- Dimensions de 8 x 8 à 50 x 50 mm



## Support pads / Rosette / Cales-supports

- Tool holders with inclination angle of  $\lambda = 1.5^\circ$
- If the helix angle deviates, choose a suitable support pad
- The tip height of the indexable insert remains the same irrespective of the support pad selected
- Portainseriti con angolo di inclinazione di  $\lambda = 1,5^\circ$
- In caso di scostamenti dell'angolo di inclinazione si deve scegliere una rosetta corrispondente
- L'altezza delle punte dell'inserto è sempre uguale, indipendentemente dalla scelta della rosetta
- Supports de serrage avec angle d'inclinaison de  $\lambda = 1,5^\circ$
- En cas d'écarts de l'angle de montée, une cale-support appropriée doit être choisie
- La hauteur de pointe de la plaquette de coupe amovible reste toujours la même, indépendamment du choix de la cale-support

## To match every thread / Adatto ad ogni filettatur / Convient pour chaque filetage

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• Metric threads (ISO)</li> <li>• Metric partial profile thread (60°, 55°)</li> <li>• American ISO thread (UN)</li> <li>• Whitworth pipe thread (BSW, BSP)</li> <li>• Tapered pipe thread (BSPT)</li> <li>• Trapezoidal thread (DIN 103)</li> <li>• American trapezoidal thread (ACME)</li> <li>• Aerospace thread (UNJ)</li> <li>• Tapered (fine) pitch pipe thread (NPT)</li> <li>• PG trapezoidal thread (DIN 40430)</li> <li>• Round thread (DIN 405)</li> <li>• Custom designs</li> </ul> | <ul style="list-style-type: none"> <li>• Filettatura metrica (ISO)</li> <li>• Filettatura metrica profilo parziale (60°, 55°)</li> <li>• Filettatura americana UNC ISO (UN)</li> <li>• Filettatura gas Whitworth (BSW, BSP)</li> <li>• Filettatura gas conica (BSPT)</li> <li>• Filettatura trapezia (DIN 103)</li> <li>• Filettatura trapezia americana (ACME)</li> <li>• Filettatura aeronautica (UNJ)</li> <li>• Filettatura gas conica (fine) (NPT)</li> <li>• Filettatura PG (DIN 40430)</li> <li>• Filettatura tonda (DIN 405)</li> <li>• Versioni speciali</li> </ul> | <ul style="list-style-type: none"> <li>• Filetage métrique (ISO)</li> <li>• Filetage profil partiel métrique (60°, 55°)</li> <li>• Filetage ISO en pouce américain (UN)</li> <li>• Filetage tubulaire Whitworth (BSW, BSP)</li> <li>• Filetage tubulaire conique (BSPT)</li> <li>• Filetage trapézoïdal (DIN 103)</li> <li>• Filetage trapézoïdal américain (ACME)</li> <li>• Filetage aéronautique (UNJ)</li> <li>• Filetage tubulaire (fin) conique (NPT)</li> <li>• Filetage pour tube blindé (DIN 40430)</li> <li>• Filetage rond (DIN 405)</li> <li>• Modèles spéciaux</li> </ul> |
|---|--|--|

# OVERVIEW OF THREAD TURNING

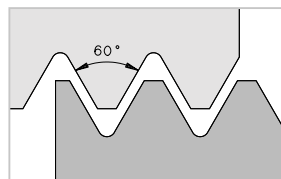
## PANORAMICA FILETTATURA

## APERÇU FILETAGE

### Partial profile

*Profilo parziale*  
 Profil partiel

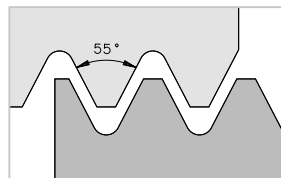
**60°**



### Partial profile

*Profilo parziale*  
 Profil partiel

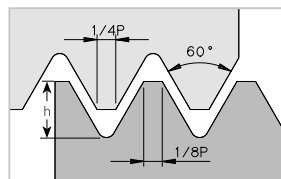
**55°**



### Metric

*Metrico*  
 Métrique

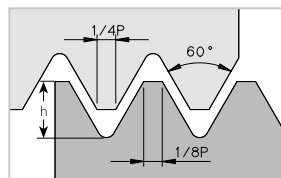
**ISO**



### American thread

*Filettatura norme americane*  
 Filetage ISO en pouce américain

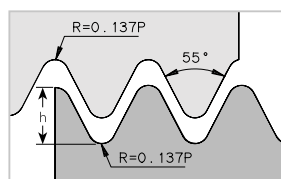
**UN**



### Whitworth pipe thread

*Filettatura Whitworth*  
 Filetage tubulaire Whitworth

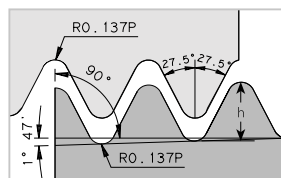
**BSW, BSP**



### Conical pipe thread

*Filettatura tubi conica*  
 Filetage tubulaire conique

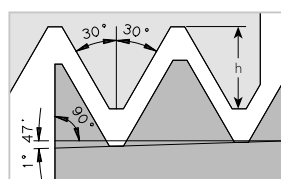
**BSPT**



### Tapered pipe thread

*Filettatura tubi conica*  
 Filetage tubulaire conique

**NPT**



### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page

**660 – 664**

### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page

**665 – 668**

### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page

**669 – 675**

### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page

**676 – 679**

### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page

**680 – 684**

### Internal thread

*Filettatura interna*  
 Filetage intérieur

Page / Pagina / Page

**685 – 686**

### External and internal thread

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

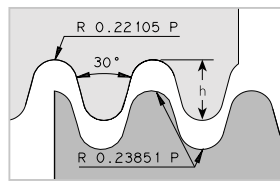
Page / Pagina / Page

**687 – 690**

**Round thread**

*Filettatura tonda*  
 Filetage rond

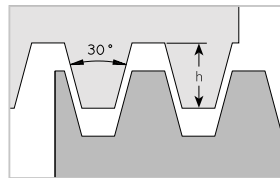
**DIN 405**



**Trapezoidal thread**

*Filettatura trapezoidale*  
 Filetage trapézoïdal

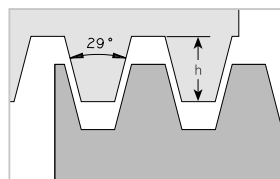
**DIN 103**



**American trapezoidal thread**

*Filettatura trapezia americana*  
 Filetage trapézoïdal américain

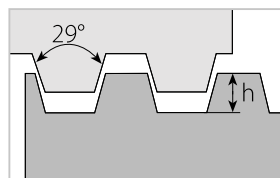
**ACME**



**American flat trapezoidal thread**

*Filettatura trapezia americana ridotta*  
 Filetage trapézoïdal américain aplati

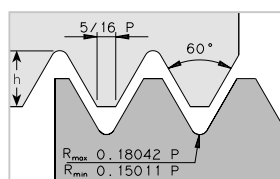
**Stub ACME**



**Aerospace thread**

*Filettatura per aeronautica*  
 Filetage aéronautique

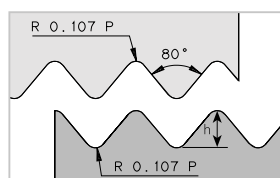
**UNJ**



**PG pipe thread**

*Filettatura PG*  
 Filetage pour tube blindé

**DIN 40430**



**Outer thread**

*Filettatura esterna*  
 Filetage extérieur

Page / Pagina / Page  
**691**

**External and internal thread**

*Filettatura esterna e interna*  
 Filetage extérieur et intérieur

Page / Pagina / Page  
**692 – 696**

**Internal thread**

*Filettatura interna*  
 Filetage intérieur

Page / Pagina / Page  
**697 – 698**

**Internal thread**

*Filettatura interna*  
 Filetage intérieur

Page / Pagina / Page  
**699 – 700**

**Internal thread**

*Filettatura interna*  
 Filetage intérieur

Page / Pagina / Page  
**701 – 703**

**Internal thread**

*Filettatura interna*  
 Filetage intérieur

Page / Pagina / Page  
**704 – 706**

**Special tools**

Indexable inserts and holders are available by request in a variety of special styles. Notes: Indexable inserts with multi-tooth profiles, tool holders and inserts for standard indexable inserts by request. For MICRO threading tools for internal machining start at 2.2 mm diameter, please see our Catalogue "Tools and Indexable Inserts for Parting Off and Grooving".

*Utensili speciali*

*Su richiesta gli inserti e i supporti sono disponibili in diverse forme speciali. Nota: disponibili su richiesta inserti con profilo multidentato e portainseriti nonché taglienti per inserti standard. Utensili per filettatura MICRO per la lavorazione interna a partire da un diametro di 2,2 mm sono presenti nel catalogo "Utensili e inserti per troncatura e scanalatura".*

Outils spéciaux

Sur demande, des plaquettes de coupe amovibles et supports dans différentes formes spéciales sont disponibles. Remarques : plaquettes de coupe amovibles avec profil à dents multiples et supports de serrage ainsi que têtes de coupe pour plaquettes de coupe amovibles standard sur demande. Veuillez consulter le catalogue « Outils et plaquettes de coupe amovibles pour le tronçonnage et l'usinage de gorges » pour les outils de filetage MICRO pour l'usinage intérieur à partir d'un diamètre de 2,2 mm.

| ID codes  | Example of abbreviations                              | Description  | Standard                          | Available thread profiles  |
|-----------|---|--|-----------------------------------|--|
| M         | M 30  | ISO metric thread Standard thread                            | DIN 13 T1                         | <ul style="list-style-type: none"> <li>• 60° partial profile</li> <li>• ISO metric (full profile)</li> </ul>                     |
|           | M 20 x 1  | general with coarse pitch                                    | DIN 13 T2-11                      |  |
|           | DIN 6630 - M 64 x 4                                   | Barrel fittings, external                                    | DIN 6630                          |  |
|           | DIN 158 - M 30 x 2 tap                                | metric tapered external thread                               | DIN 158                           | <ul style="list-style-type: none"> <li>• On request</li> </ul>   |
| G         | G 1 <sup>1</sup> / <sub>2</sub>                       | Cylindrical pipe thread, non-sealing thread, internal thread | DIN ISO 228 T1                    | <ul style="list-style-type: none"> <li>• 55° partial profile</li> <li>• Whitworth pipe thread BSW, BSP (full profile)</li> </ul> |
|           | G 1 <sup>1</sup> / <sub>2</sub> A                     | Outer thread   | DIN ISO 228 T1                    |  |
| Rp        | DIN 2999 - Rp 1 <sup>1</sup> / <sub>2</sub>           | Cylindrical pipe thread, sealing thread, internal thread     | DIN 2999 T1                       | <ul style="list-style-type: none"> <li>• 55° partial profile</li> <li>• Whitworth pipe thread BSW, BSP (full profile)</li> </ul> |
|           | DIN 3858 - Rp 1 <sup>1</sup> / <sub>8</sub>           |  | DIN 3858                          |  |
| R         | DIN 2999 - R 1 <sup>1</sup> / <sub>2</sub>            | tapered pipe thread, sealing thread, external thread         | DIN 2999 T1                       | <ul style="list-style-type: none"> <li>• Tapered pipe thread BSPT (full profile)</li> </ul>                                      |
|           | DIN 3858 - R 1 <sup>1</sup> / <sub>8</sub> - 1        |  | DIN 3858                          |  |
| Tr        | Tr 40 x 7   | Metric ISO trapezoidal thread, general                       | DIN 103 T1-8                      | <ul style="list-style-type: none"> <li>• Trapezoidal thread DIN 103 (full profile)</li> </ul>                                    |
| S         | S 48 x 8  | Buttress thread, general                                     | DIN 513 T2                        | <ul style="list-style-type: none"> <li>• On request</li> </ul>   |
| Rd        | Rd 40 x 1 <sup>1</sup> / <sub>8</sub>                 | Round thread, general  | DIN 405                           | <ul style="list-style-type: none"> <li>• Round thread DIN 405 (full profile)</li> </ul>  |
|           | Rd 40 x 5   | Cylindrical round thread for mining                          | DIN 20400                         | <ul style="list-style-type: none"> <li>• On request</li> </ul>   |
| E         | DIN 40400 - E 27                                      | Electric thread  | DIN 40400                         | <ul style="list-style-type: none"> <li>• On request</li> </ul>   |
| W         | DIN 477 - W 21,8 x 1 <sup>1</sup> / <sub>14</sub>     | Cylindrical Whitworth thread                                 | DIN 477 T1                        | <ul style="list-style-type: none"> <li>• 55° partial profile</li> <li>• Whitworth pipe thread BSW, BSP (full profile)</li> </ul> |
|           | DIN 477 - W 28,8 x 1 <sup>1</sup> / <sub>14</sub> tap | Tapered Whitworth thread                                     |                                   | <ul style="list-style-type: none"> <li>• Tapered Whitworth thread (full profile)</li> </ul>                                      |
| Pg        | DIN 40430 - Pg 21                                     | PG pipe thread   | DIN 40430                         | <ul style="list-style-type: none"> <li>• PG pipe thread DIN 40430 (full profile)</li> </ul>                                      |
| UN        | 1 <sup>1</sup> / <sub>4</sub> - 20 UNC - 2A           | American ISO thread, coarse pitch                            |                                   | <ul style="list-style-type: none"> <li>• American ISO inch thread UN (full profile)</li> </ul>                                   |
|           | 1 <sup>1</sup> / <sub>4</sub> - 28 UNF - 3A           | Fine pitch   |                                   |  |
| UNJ       | 1 <sup>1</sup> / <sub>4</sub> - 28 UNJ - 3A           | Aerospace thread   |                                   | <ul style="list-style-type: none"> <li>• Aerospace thread UNJ (full profile)</li> </ul>  |
| MJ        | MJ 6 x 1 - 4h6h<br>MJ 6 x 1 - 4HGh                    | Aerospace  | DIN ISO 5855-1 and DIN ISO 5855-2 | <ul style="list-style-type: none"> <li>• Aerospace thread MJ (full profile)</li> </ul>   |
| NPT       | 3 <sup>3</sup> / <sub>8</sub> - 18 NPT                | Tapered pipe thread  |                                   | <ul style="list-style-type: none"> <li>• Tapered pipe thread NPT (full profile)</li> </ul>                                       |
| NPTF      | 1 <sup>1</sup> / <sub>8</sub> - 27 NPTF - 1           | Tapered fine pipe thread                                     |                                   | <ul style="list-style-type: none"> <li>• Tapered fine pipe thread NPTF (full profile)</li> </ul>                                 |
| ACME      | 13 <sup>3</sup> / <sub>4</sub> - ACME - 2G            | American trapezoidal thread                                  |                                   | <ul style="list-style-type: none"> <li>• American trapezoidal thread ACME (full profile)</li> </ul>                              |
| Stub ACME | 1 <sup>1</sup> / <sub>2</sub> - 20 Stub ACME          | American flat trapezoidal thread                             |                                   | <ul style="list-style-type: none"> <li>• American flat trapezoidal thread (full profile)</li> </ul>                              |



| Lettere codice | Esempio di denominazione abbreviata     | Denominazione   | Norma                           | Profili filettatura disponibili  |
|----------------|---|---|---------------------------------|--|
| M              | M 30                                    | Filettatura standard metrica ISO gen.   | DIN 13 T1                       | <ul style="list-style-type: none"> <li>• Profilo parziale 60°</li> <li>• metrica ISO (profilo pieno)</li> </ul>                        |
|                | M 20 x 1                                | generale con passo grosso   | DIN 13 T2-11                    |  |
|                | DIN 6630 - M 64 x 4                     | Ghiera di fissaggio, esterna  | DIN 6630                        |  |
|                | DIN 158 - M 30 x 2 con.                 | Filettatura esterna metrica conica  | DIN 158                         | <ul style="list-style-type: none"> <li>• A richiesta</li> </ul>  |
| G              | G 1 $\frac{1}{2}$                       | Filettatura cilindrica gas, non ermetica nella filettatura, filettatura interna | DIN ISO 228 T1                  | <ul style="list-style-type: none"> <li>• Profilo parziale 55°</li> <li>• Filettatura gas Whitworth BSW, BSP (profilo pieno)</li> </ul> |
|                | G 1 $\frac{1}{2}$ A                     | Filettatura esterna   | DIN ISO 228 T1                  |  |
| Rp             | DIN 2999 - Rp 1 $\frac{1}{2}$           | Filettatura cilindrica gas, ermetica nella filettatura, filettatura interna     | DIN 2999 T1                     | <ul style="list-style-type: none"> <li>• Profilo parziale 55°</li> <li>• Filettatura gas Whitworth BSW, BSP (profilo pieno)</li> </ul> |
|                | DIN 3858 - Rp 1 $\frac{1}{8}$           |   | DIN 3858                        |  |
| R              | DIN 2999 - R 1 $\frac{1}{2}$            | Filettatura conica gas, ermetica nella filettatura, filettatura esterna         | DIN 2999 T1                     | <ul style="list-style-type: none"> <li>• Filettatura gas conica BSPT (profilo pieno)</li> </ul>  |
|                | DIN 3858 - R 1 $\frac{1}{8}$ - 1        |   | DIN 3858                        |  |
| Tr             | Tr 40 x 7                               | Filettatura trapezia, metrica ISO, generale                                     | DIN 103 T1-8                    | <ul style="list-style-type: none"> <li>• Filettatura trapezia-DIN 103 (profilo pieno)</li> </ul>                                       |
| S              | S 48 x 8                                | Filettatura a denti di sega, generale   | DIN 513 T2                      | <ul style="list-style-type: none"> <li>• A richiesta</li> </ul>  |
| Rd             | Rd 40 x 1 $\frac{1}{8}$                 | Filettatura tonda, generale   | DIN 405                         | <ul style="list-style-type: none"> <li>• Filettatura tonda DIN 405 (profilo pieno)</li> </ul>  |
|                | Rd 40 x 5                               | Filettatura tonda cilindrica per industria estrattiva                           | DIN 20400                       | <ul style="list-style-type: none"> <li>• A richiesta</li> </ul>  |
| E              | DIN 40400 - E 27                        | Filettatura elettrica   | DIN 40400                       | <ul style="list-style-type: none"> <li>• A richiesta</li> </ul>  |
| W              | DIN 477 - W 21,8 x 1 $\frac{1}{14}$     | Filettatura Whitworth cilindrica  | DIN 477 T1                      | <ul style="list-style-type: none"> <li>• Profilo parziale 55°</li> <li>• Filettatura gas Whitworth BSW, BSP (profilo pieno)</li> </ul> |
|                | DIN 477 - W 28,8 x 1 $\frac{1}{14}$ con | Filettatura Whitworth conica  |                                 | <ul style="list-style-type: none"> <li>• Filettatura Whitworth conica (profilo pieno)</li> </ul>                                       |
| Pg             | DIN 40430 - Pg 21                       | Filettatura PG  | DIN 40430                       | <ul style="list-style-type: none"> <li>• Filettatura PG DIN 40430 (profilo pieno)</li> </ul>   |
| UN             | 1 $\frac{1}{4}$ - 20 UNC - 2A           | Filettatura americana UNC ISO, filettatura unificata, grezza                    |                                 | <ul style="list-style-type: none"> <li>• Filettatura americana ISO UN - (profilo pieno)</li> </ul>                                     |
|                | 1 $\frac{1}{4}$ - 28 UNF - 3A           | filettatura unificata, fine   |                                 |  |
| UNJ            | 1 $\frac{1}{4}$ - 28 UNJ - 3A           | Filettatura per aeronautica   |                                 | <ul style="list-style-type: none"> <li>• Filettatura per aeronautica UNJ (profilo pieno)</li> </ul>                                    |
| MJ             | MJ 6 x 1 - 4h6h<br>MJ 6 x 1 - 4HGh      | Aerospaziale  | DIN ISO 5855-1 e DIN ISO 5855-2 | <ul style="list-style-type: none"> <li>• Filettatura per aeronautica MJ (profilo pieno)</li> </ul>                                     |
| NPT            | 3 $\frac{3}{8}$ - 18 NPT                | Filettatura conica gas  |                                 | <ul style="list-style-type: none"> <li>• Filettatura gas conica NPT (profilo pieno)</li> </ul>   |
| NPTF           | 1 $\frac{1}{8}$ - 27 NPTF - 1           | Filettatura gas, fine, conica   |                                 | <ul style="list-style-type: none"> <li>• Filettatura gas fine, conica NPTF (profilo pieno)</li> </ul>                                  |
| ACME           | 1 $\frac{3}{4}$ - ACME - 2G             | Filettatura trapezia americana  |                                 | <ul style="list-style-type: none"> <li>• Filettatura trapezia americana ACME (profilo pieno)</li> </ul>                                |
| Stub-ACME      | 1 $\frac{1}{2}$ - 20 Stub-ACME          | Filettatura trapezia americana ridotta  |                                 | <ul style="list-style-type: none"> <li>• Filettatura trapezia americana ridotta (profilo pieno)</li> </ul>                             |

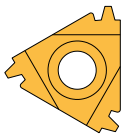


| Lettres d'identification | Exemple de brèves description            | Désignation  | Norme                            | Profils de filetage disponibles  |
|--------------------------|--|--|----------------------------------|--|
| M                        | M 30                                     | Filetage normal ISO métrique   | DIN 13 T1                        | <ul style="list-style-type: none"> <li>• Profil partiel 60°</li> <li>• ISO métrique (profil complet)</li> </ul>                          |
|                          | M 20 x 1                                 | général à grand pas  | DIN 13 T2-11                     |  |
|                          | DIN 6630 – M 64 x 4                      | Raccord fileté, extérieur  | DIN 6630                         |  |
|                          | DIN 158 M 30 x 2 con.                    | filetage extérieur conique métrique  | DIN 158                          | <ul style="list-style-type: none"> <li>• Sur demande</li> </ul>  |
| G                        | G 1 $\frac{1}{2}$                        | Filetage tubulaire cylindrique, non étanche dans le filetage, filetage intérieur | DIN ISO 228 T1                   | <ul style="list-style-type: none"> <li>• Profil partiel 55°</li> <li>• Filetage tubulaire Whitworth BSW, BSP (profil complet)</li> </ul> |
|                          | G 1 $\frac{1}{2}$ A                      | Filetage extérieur   | DIN ISO 228 T1                   |  |
| Rp                       | DIN 2999 – Rp 1 $\frac{1}{2}$            | Filetage tubulaire cylindrique, étanche dans le filetage, filetage intérieur     | DIN 2999 T1                      | <ul style="list-style-type: none"> <li>• Profil partiel 55°</li> <li>• Filetage tubulaire Whitworth BSW, BSP (profil complet)</li> </ul> |
|                          | DIN 3858 – Rp 1 $\frac{1}{8}$            |  | DIN 3858                         |  |
| R                        | DIN 2999 – R 1 $\frac{1}{2}$             | filetage tubulaire conique, étanche dans le filetage, filetage extérieur         | DIN 2999 T1                      | <ul style="list-style-type: none"> <li>• Filetage tubulaire conique BSPT (profil complet)</li> </ul>                                     |
|                          | DIN 3858 – R 1 $\frac{1}{8}$ – 1         |  | DIN 3858                         |  |
| Tr                       | Tr 40 x 7                                | Filetage trapézoïdal ISO métrique, général                                       | DIN 103 T1-8                     | <ul style="list-style-type: none"> <li>• Filetage trapézoïdal DIN 103 (profil complet)</li> </ul>  |
| S                        | S 48 x 8                                 | Filetage en dents de scie, général   | DIN 513 T2                       | <ul style="list-style-type: none"> <li>• Sur demande</li> </ul>  |
| Rd                       | Rd 40 x 1 $\frac{1}{8}$                  | Filetage rond, général   | DIN 405                          | <ul style="list-style-type: none"> <li>• Filetage rond DIN 405 (profil complet)</li> </ul>   |
|                          | Rd 40 x 5                                | Filetage rond cylindrique dans le secteur minier                                 | DIN 20400                        | <ul style="list-style-type: none"> <li>• Sur demande</li> </ul>  |
| E                        | DIN 40400 – E 27                         | Filetage électrique  | DIN 40400                        | <ul style="list-style-type: none"> <li>• Sur demande</li> </ul>  |
| W                        | DIN 477 – W 21,8 x 1 $\frac{1}{14}$      | Filetage cylindrique Whitworth   | DIN 477 T1                       | <ul style="list-style-type: none"> <li>• Profil partiel 55°</li> <li>• Filetage tubulaire Whitworth BSW, BSP (profil complet)</li> </ul> |
|                          | DIN 477 – W 28,8 x 1 $\frac{1}{14}$ con. | Filetage conique Whitworth   |                                  | <ul style="list-style-type: none"> <li>• Filetage conique Whitworth (profil complet)</li> </ul>  |
| Pg                       | DIN 40430 – Pg 21                        | Filetage pour tube blindé  | DIN 40430                        | <ul style="list-style-type: none"> <li>• Filetage pour tube blindé DIN 40430 (profil complet)</li> </ul>                                 |
| UN                       | 1 $\frac{1}{4}$ – 20 UNC – 2A            | Filetage ISO en pouce américain filet unifié, pas gros                           |                                  | <ul style="list-style-type: none"> <li>• Filetage ISO en pouce américain UN (profil complet)</li> </ul>                                  |
|                          | 1 $\frac{1}{4}$ – 28 UNF – 3A            | Filet unifié, pas fin  |                                  |  |
| UNJ                      | 1 $\frac{1}{4}$ – 28 UNJ – 3A            | Filetage aéronautique  |                                  | <ul style="list-style-type: none"> <li>• Filetage aéronautique UNJ (profil complet)</li> </ul>   |
| MJ                       | MJ 6 x 1 – 4h6h<br>MJ 6 x 1 – 4h6h       | Industrie aéronautique et aérospatiale   | DIN ISO 5855-1 et DIN ISO 5855-2 | <ul style="list-style-type: none"> <li>• Filetage aéronautique MJ (profil complet)</li> </ul>  |
| NPT                      | 3 $\frac{3}{8}$ – 18 NPT                 | Filetage tubulaire conique   |                                  | <ul style="list-style-type: none"> <li>• Filetage tubulaire conique NPT (profil complet)</li> </ul>                                      |
| NPTF                     | 1 $\frac{1}{8}$ – 27 NPTF – 1            | Filetage tubulaire conique fin   |                                  | <ul style="list-style-type: none"> <li>• Filetage tubulaire conique fin NPTF (profil complet)</li> </ul>                                 |
| ACME                     | 1 $\frac{3}{4}$ – ACME – 2G              | Filetage trapézoïdal américain   |                                  | <ul style="list-style-type: none"> <li>• Filetage trapézoïdal américain ACME (profil complet)</li> </ul>                                 |
| Stub-ACME                | 1 $\frac{1}{2}$ – 20 Stub-ACME           | Filetage trapézoïdal américain aplati  |                                  | <ul style="list-style-type: none"> <li>• Filetage trapézoïdal américain aplati (profil complet)</li> </ul>                               |

# THREAD TURNING

## FILETTATURA

## FILETAGE



### Standard geometry

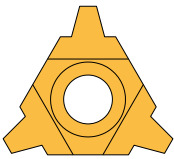
Indexable insert for all thread profiles. Thread turning almost against the workpiece shoulder since the profile tip of the indexable insert must be as close as possible to the theoretical top of the insert blank.

### Versione standard

*Inserto per tutti i profili della filettatura. Filettatura quasi fino allo spallamento, essendo la punta del profilo dell'inserto il più vicino possibile alla punta teorica del pezzo grezzo triangolare.*

### Version standard

Plaquette de coupe amovible pour tous profils de filetage. Filetage presque jusqu'à l'épaule grâce à la pointe du profil de la plaquette de coupe amovible située le plus près possible de la pointe théorique du triangle d'ébauche.



### ...UE... geometry

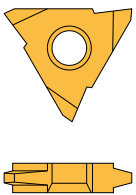
Stable indexable insert. For threads with coarse pitches.

### Versione..UE...

*Inserto stabile. Speciale per filettature con passi elevati*

### Version ..UE...

Plaquette de coupe amovible stable. Spécialement conçue pour filetages à grands pas.



### ...VE... geometry

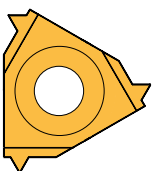
Perpendicular indexable insert for machining coarse profiles, for pitches of 6–10 mm and external back turning.

### Versione..VE...

*Inserto verticale per la lavorazione di profili di grandi dimensioni, con passi da 6 a 10 mm e per la lavorazione esterna posteriormente al collare.*

### Version ..VE...

Plaquette de coupe amovible posée verticalement pour l'usinage de grands profils, avec pas de 6 à 10 mm et pour l'usinage extérieur contre épaulement.



### 6K... geometry

For internal machining of small diameters greater than 9.3 mm.  
3 flutes

### Versione 6K...

*Per la lavorazione interna di piccoli diametri a partire da 9,3 mm  
3 taglienti*

### Version 6K...

Pour l'usinage intérieur de petits diamètres à partir de 9,3 mm.  
3 bords tranchants



### 5LK... geometry

For internal machining of small diameters greater than 7.3 mm.  
2 flutes

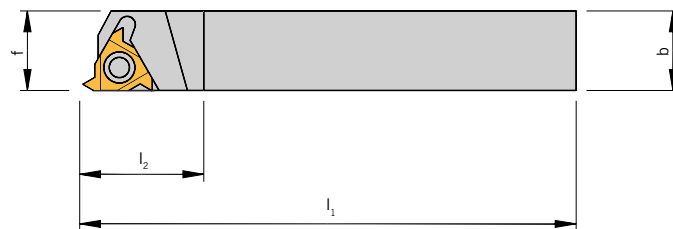
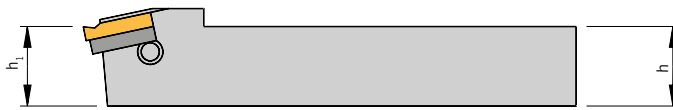
### Versione 5LK...

*Per la lavorazione interna di piccoli diametri a partire da 7,3 mm  
2 taglienti*

### Version 5LK...

Pour l'usinage intérieur de petits diamètres à partir de 7,3 mm.  
2 bords tranchants

## External thread / Filettatura esterna / Filetage extérieur



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f  | $l_1$ | $l_2$ | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|----|-------|-------|-----------------------------|
| AL 3/8-3L/R                        | 9,52          | 16 | 63,6  | 20,5  | 16E...                      |
| AL 12-3L/R                         | 12,00         | 16 | 83,2  | 22,0  | 16E...                      |
| AL 16-3L/R                         | 16,00         | 16 | 100,0 | 20,5  | 16E...                      |
| AL 20-3L/R                         | 20,00         | 20 | 128,6 | 30,0  | 16E...                      |
| AL 25-3L/R                         | 25,00         | 25 | 153,6 | 30,0  | 16E...                      |
| AL 25-4L/R                         | 25,00         | 25 | 155,7 | 36,0  | 22E...                      |
| AL 32-3L/R                         | 32,00         | 32 | 173,6 | 30,0  | 16E...                      |
| AL 32-4L/R                         | 32,00         | 32 | 175,7 | 36,0  | 22E...                      |
| AL 32-5L/R                         | 32,00         | 32 | 176,6 | 40,0  | 27E...                      |
| AL 40-4L/R                         | 40,00         | 40 | 205,7 | 36,0  | 22E...                      |
| AL 40-5L/R                         | 40,00         | 40 | 206,6 | 40,0  | 27E...                      |
| AL 50-5R                           | 50,00         | 50 | 256,6 | 40,0  | 27E...                      |
| NL 8-2L/R                          | 8,00          | 11 | 136,4 | 17,5  | 11E...                      |
| NL 10-2L/R                         | 10,00         | 11 | 70,0  | 17,5  | 11E...                      |
| NL 12-2L/R                         | 12,00         | 12 | 80,0  | 17,5  | 11E...                      |
| NL 12-3L/R                         | 12,00         | 16 | 83,2  | 22,0  | 16E...                      |



The tool holders have a helix angle of 1.5°. Support pads for different helix angles are on pages 722–723. They must be ordered separately.

Gli utensili sono studiati per un angolo di elica di 1,5°. Per supporti con altri angoli di elica vedere alle pagine 722–723. Questi devono essere ordinati separatamente.

Les supports de serrage ont un angle d'inclinaison de 1,5°. Vous trouverez les cales-supports pour d'autres angles d'inclinaison aux pages 722–723. Elles sont à commander séparément.

## 9

## Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|----------------------|---|---|
| 11E...                                   | SN2T   | -  | KS 1751              | -   | -   |
| 16E...                                   | SA3T   | SY3T   | KS 2510              | YE3   | YI3   |
| 22E...                                   | SA4T   | SY4T   | KS 2520              | YE4   | YI4   |
| 27E...                                   | SA5T   | SY5T   | KS 2525              | YE5   | YI5   |

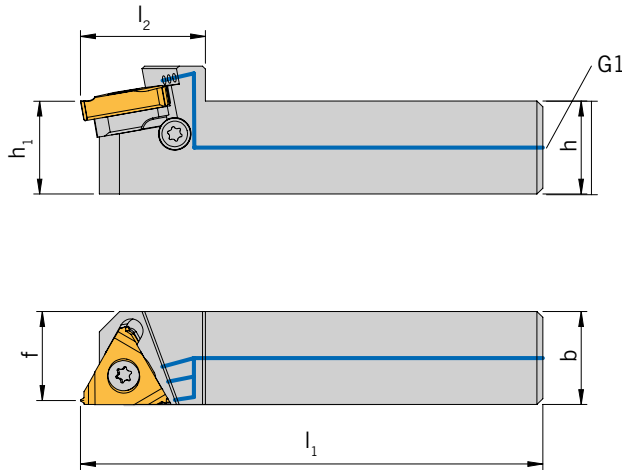
**External thread – standard design / Filettatura esterna – versione standard / Filetage mâle – version standard**



**Tool holder with IK-H-MS - specially for INDEX/TRAUB with MS 22 interface /**

*Utensili con IK-H-MS - specifici per INDEX/TRAUB con l'interfaccia MS 22 /*

*Supports de serrage avec IK-H-MS - spécifiques à INDEX/TRAUB avec interface MS22*



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f    | $l_1$ | $l_2$ | Thread 1<br>Filetto 1<br>Filet 1 | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|------|-------|-------|----------------------------------|-----------------------------|
| AL16-3-R-IK-H2-MS                  | 16            | 15,3 | 77,5  | 21,5  | G 1/8"                           | 16ER...                     |

**!** For the F dimension when installed, see the basic holder application reference. These tool holders fit on the following basic holders from INDEX/TRAUB: W519 0002 / W519 0003 / W519 0004 / W519 0194 / W519 0195 / W519 0197.

*Per la dimensione F quando montati, si vedano le note tecniche per gli steli base. Questi steli con bloccaggio sono adatti ai seguenti steli di INDEX/TRAUB: W519 0002 / W519 0003 / W519 0004 / W519 0194 / W519 0195 / W519 0197.*

*Pour la dimension F une fois le montage effectué, voir la consigne d'utilisation du support de base. Ces supports de serrage s'adaptent aux supports suivants de chez INDEX/TRAUB : W519 0002 / W519 0003 / W519 0004 / W519 0194 / W519 0195 / W519 0197.*

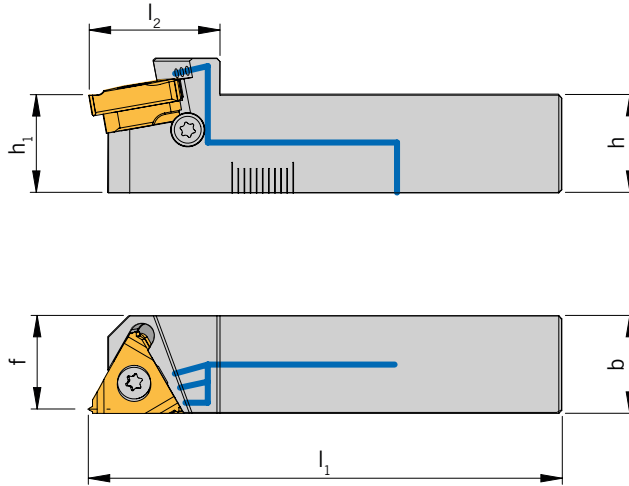
**Spare Parts / Ricambi / Pièces de rechange**

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|----------------------|---|---|
| 16E...                                   | SA3T   | SY3T   | KS 2510              | YE3   | YI3   |

**External thread – standard design / Filettatura esterna – versione standard / Filetage mâle – version standard**



**Tool holder with IK-H-MS - special for INDEX/TRAUB TNL18 / TNL20 / TNL32 / Adattatore con IK-H-MS - specifico per INDEX/TRAUB TNL18 / TNL20 / TNL32 / Supports de serrage avec IK-H-MS - spécifiques à INDEX/TRAUB TNL18/TNL20/TNL32**



**Holders / Utensili / Porte-outils**

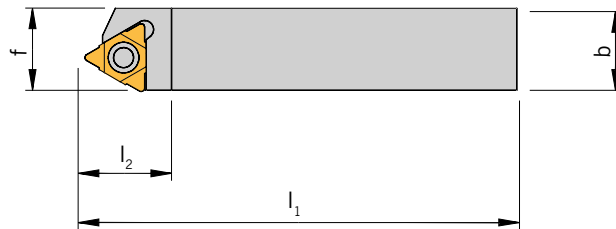
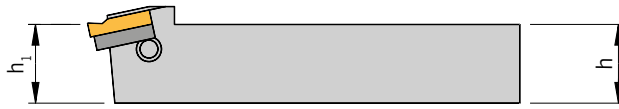
| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f    | $l_1$ | $l_2$ | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|------|-------|-------|-----------------------------|
| AL16-3-R-IK-UN-TR                  | 16            | 15,3 | 77,5  | 21,5  | 16ER...                     |

**!** For the F dimension when installed, see the basic holder application reference. These tool holders fit on the following basic holders from INDEX/TRAUB: W7040055 / W7040056  
 Per la dimensione F quando montati, si vedano le note tecniche per gli steli base. Questi steli con bloccaggio sono adatti ai seguenti adattatori di INDEX/TRAUB: W7040055 / W7040056  
 Pour la dimension F une fois le montage effectué, voir la consigne d'utilisation du support de base. Ces supports de serrage s'adaptent aux supports suivants de chez INDEX/TRAUB : W7040055 / W7040056

**Spare Parts / Ricambi / Pièces de rechange**

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|----------------------|---|---|
| 16E...                                   | SA3T   | SY3T   | KS 2510              | YE3   | Y13   |

External thread / Filettatura esterna / Filetage extérieur



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f  | $l_1$ | $l_2$ | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|----|-------|-------|-----------------------------|
| AL 25-4UL/R                        | 25            | 25 | 178,4 | 38    | 22UE...                     |
| AL 25-5UL/R                        | 25            | 25 | 179,1 | 40    | 27UE...                     |
| AL 32-4UL/R                        | 32            | 32 | 178,4 | 38    | 22UE...                     |
| AL 32-5UL/R                        | 32            | 32 | 179,1 | 40    | 27UE...                     |
| AL 40-4UL/R                        | 40            | 40 | 208,4 | 38    | 22UE...                     |
| AL 40-5UL/R                        | 40            | 40 | 209,1 | 40    | 27UE...                     |
| AL 50-5UR                          | 50            | 50 | 259,1 | 40    | 27UE...                     |



The tool holders have a helix angle of 1,5°. Support pads for different helix angles are on pages 722–723. They must be ordered separately.

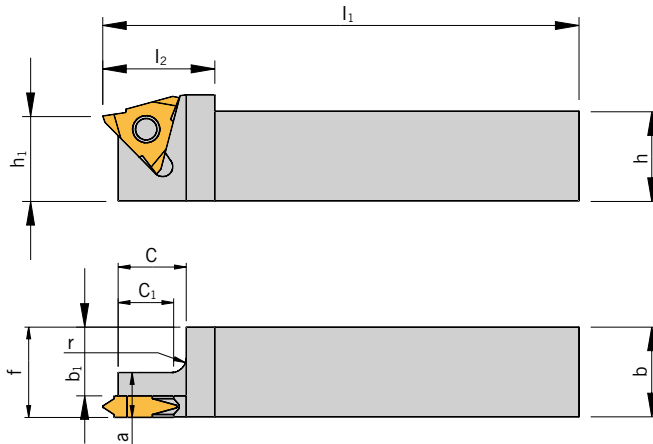
Gli utensili sono studiati per un angolo di elica di 1,5°. Per supporti con altri angoli di elica vedere alle pagine 722–723. Questi devono essere ordinati separatamente.

Les supports de serrage ont un angle d'inclinaison de 1,5°. Vous trouverez les cales-supports pour d'autres angles d'inclinaison aux pages 722–723. Elles sont à commander séparément.

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|----------------------|---|---|
| 22UE...                                  | SA4T   | SY4T   | KS 2520              | YE4U  | YI4U  |
| 27UE...                                  | SA5T   | SY5T   | KS 2525              | YE5U  | YI5U  |

## External thread / Filettatura esterna / Filetage extérieur



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f  | a  | $b_1$ | c    | $c_1$ | $l_1$ | $l_2$ | r | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|----|----|-------|------|-------|-------|-------|---|-----------------------------|
| NL 8-2VL/R                         | 8             | 10 | 7  | 4,8   | 12,5 | 11,5  | 60    | 14,0  | 1 | 11VE...                     |
| NL 10-2VL/R                        | 10            | 10 | 7  | 6,8   | 12,5 | 11,5  | 70    | 14,0  | 1 | 11VE...                     |
| NL 10-3VL/R                        | 10            | 14 | 7  | 6,4   | 14,5 | 11,5  | 70    | 18,5  | 3 | 16VE...                     |
| NL 12-2VL/R                        | 12            | 12 | 7  | 8,8   | 14,5 | 11,5  | 80    | 14,0  | 3 | 11VE...                     |
| NL 12-3VL/R                        | 12            | 14 | 7  | 8,4   | 14,5 | 11,5  | 80    | 18,5  | 3 | 16VE...                     |
| NL 16-2VL/R                        | 16            | 16 | 7  | 12,8  | 14,5 | 11,5  | 100   | 14,0  | 3 | 11VE...                     |
| NL 16-3VL/R                        | 16            | 16 | 7  | 12,4  | 14,5 | 11,5  | 100   | 25,0  | 3 | 16VE...                     |
| NL 20-3VL/R                        | 20            | 20 | 7  | 16,4  | 16,5 | 11,5  | 125   | 30,0  | 3 | 16VE...                     |
| NL 25-3VL/R                        | 25            | 25 | 7  | 21,4  | 16,5 | 11,5  | 150   | 30,0  | 5 | 16VE...                     |
| NL 25-4VL/R                        | 25            | 25 | 12 | 20,2  | 16,5 | 11,5  | 150   | 30,0  | 5 | 22VE...                     |
| NL 32-3VL/R                        | 32            | 32 | 7  | 28,4  | 16,5 | 11,5  | 170   | 30,0  | 5 | 16VE...                     |
| NL 32-4VL/R                        | 32            | 32 | 12 | 27,2  | 16,5 | 11,5  | 170   | 30,0  | 5 | 22VE...                     |
| NL 40-3VL/R                        | 40            | 40 | 7  | 36,4  | 16,5 | 11,5  | 200   | 30,0  | 5 | 16VE...                     |
| NL 40-4VL/R                        | 40            | 40 | 12 | 35,2  | 16,5 | 11,5  | 200   | 30,0  | 5 | 22VE...                     |



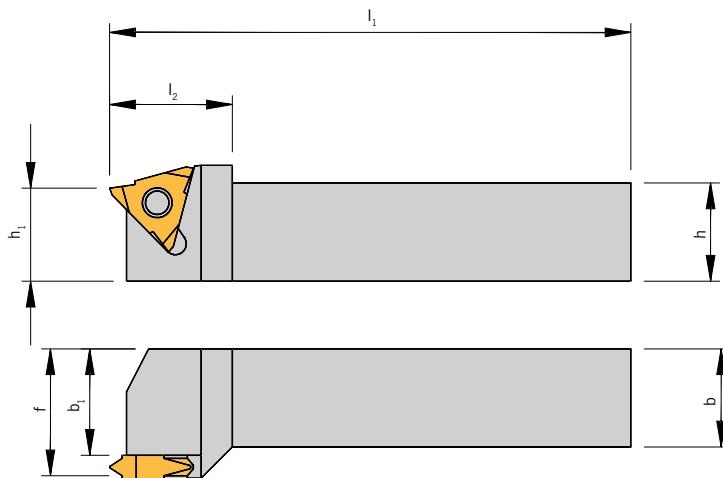
All toolholders are supplied with a helix angle of 1.5°.  
Gli utensili sono studiati per un angolo di elica di 1,5°.  
Les porte-outils ont un angle d'inclinaison de 1,5°.

## Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Key<br>Chiave<br>Clé |
|--|--|----------------------|
| 11VE...                                  | SN2T   | KS 1751              |
| 16VE...                                  | SN3T   | KS 2510              |
| 22VE...                                  | SN4T   | KS 2520              |

9

## External thread / Filettatura esterna / Filetage extérieur



## Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f    | $b_1$ | $l_1$ | $l_2$ | Insert<br>Inserto<br>Insert |
|------------------------------------|---------------|------|-------|-------|-------|-----------------------------|
| NL 32-5V-6L/R                      | 32            | 32,0 | 25,5  | 170   | 40    | 27VE...                     |
| NL 32-5V-8L/R                      | 32            | 34,1 | 25,5  | 170   | 40    | 27VE...                     |
| NL 32-5V-10L/R                     | 32            | 35,8 | 25,5  | 170   | 40    | 27VE...                     |
| NL 40-5V-6L/R                      | 40            | 40,0 | 33,5  | 200   | 40    | 27VE...                     |
| NL 40-5V-8L/R                      | 40            | 42,1 | 33,5  | 200   | 40    | 27VE...                     |
| NL 40-5V-10L/R                     | 40            | 43,8 | 33,5  | 200   | 40    | 27VE...                     |



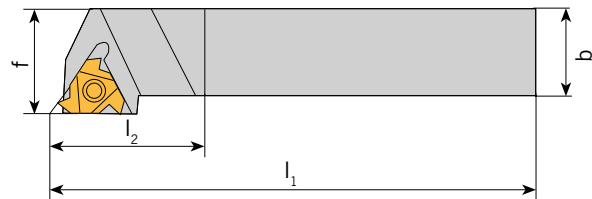
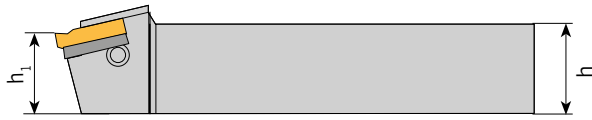
All toolholders are supplied with a helix angle of 1.5°.  
 Gli utensili sono studiati per un angolo di elica di 1,5°.  
 Les porte-outils ont un angle d'inclinaison de 1,5°.

## Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Key<br>Chiave<br>Clé |
|--|--|----------------------|
| 27VE...                                  | SN6T   | KS 2525              |



External thread / Filettatura esterna / Filetage extérieur



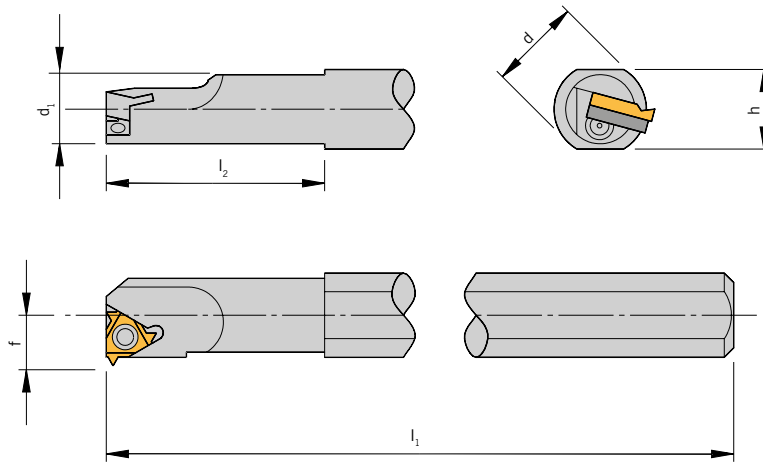
Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | $h = h_1 = b$ | f  | $l_1$ | $l_2$ | Insert<br>Insero<br>Insert |
|------------------------------------|---------------|----|-------|-------|----------------------------|
| AL 20-3FQR                         | 20            | 25 | 125   | 25    | 16E...                     |
| AL 25-3FQR                         | 25            | 32 | 150   | 25    | 16E...                     |

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|----------------------|---|---|
| 16E...                                   | SA3T   | SY3T   | KS 2510              | YE3   | YI3   |

Internal thread / Filettatura interna / Filetage intérieur



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | h    | l <sub>1</sub> | l <sub>2</sub> | f    | d  | d <sub>1</sub> | Min. bore dia.<br>Diametro<br>preforo min.<br>Avant-trou min. | Insert<br>Inserto<br>Insert |
|------------------------------------|------|----------------|----------------|------|----|----------------|---|-----------------------------|
| AVR 20-3L/R                        | 18,0 | 180            | 40             | 13,4 | 20 | 20,0           | 24  | 161...                      |
| AVR 25-3L/R                        | 29,0 | 250            | 60             | 16,3 | 32 | 25,0           | 29  | 161...                      |
| AVR 25-4L/R                        | 29,0 | 250            | 60             | 17,4 | 32 | 25,0           | 32  | 221...                      |
| AVR 25D-3L/R                       | 22,6 | 200            | 45             | 16,1 | 25 | 24,6           | 29  | 161...                      |
| AVR 25D-4L/R                       | 22,6 | 200            | 45             | 17,2 | 25 | 24,6           | 32  | 221...                      |
| AVR 32-3L/R                        | 29,0 | 250            | 60             | 19,6 | 32 | 32,0           | 36  | 161...                      |
| AVR 32-4L/R                        | 29,0 | 250            | 60             | 21,5 | 32 | 32,0           | 39  | 221...                      |
| AVR 32-5L/R                        | 29,0 | 250            | 60             | 22,4 | 32 | 32,0           | 40  | 271...                      |
| AVR 40-3L/R                        | 36,0 | 300            | 60             | 23,8 | 40 | 40,0           | 44  | 161...                      |
| AVR 40-4L/R                        | 36,0 | 300            | 60             | 25,8 | 40 | 40,0           | 47  | 221...                      |
| AVR 40-5L/R                        | 36,0 | 300            | 60             | 26,4 | 40 | 40,0           | 48  | 271...                      |
| AVR 50-4L/R                        | 45,0 | 350            | 75             | 30,8 | 50 | 50,0           | 57  | 221...                      |
| AVR 50-5L/R                        | 45,0 | 350            | 75             | 31,4 | 50 | 50,0           | 58  | 271...                      |
| AVR 60-5L/R                        | 54,0 | 400            | 75             | 36,4 | 60 | 60,0           | 69  | 271...                      |
| NVR 10-2L/R                        | 18,0 | 180            | 25             | 7,3  | 20 | 10,0           | 13  | 111...                      |
| NVR 10D-2L/R                       | 9,5  | 100            | 40             | 7,3  | 10 | 10,0           | 13  | 111...                      |
| NVR 13-2L/R                        | 18,0 | 180            | 32             | 8,9  | 20 | 13,0           | 16  | 111...                      |
| NVR 13-3L/R                        | 18,0 | 180            | 32             | 10,3 | 20 | 12,7           | 17  | 161...                      |
| NVR 16-3L/R <sup>1)</sup>          | 18,0 | 180            | 40             | 11,5 | 20 | 16,0           | 20  | 161...                      |
| NVR 16D-3L/R                       | 15,2 | 150            | 39             | 11,3 | 16 | 16,0           | 20  | 161...                      |
| NVR 20-4L/R <sup>2)</sup>          | 18,0 | 180            | 50             | 15,6 | 20 | 20,0           | 27  | 221...                      |

**!** The tool holders have a helix angle of 1.5°. Support pads for different helix angles are on pages 722–723 et seq. They must be ordered separately. Tool holders designated “N...” are used without blade support pad.

Gli utensili sono studiati per un angolo di elica di 1,5°. I supporti per altri angoli di inclinazione sono disponibili alle pagine 722–723. Questi devono essere ordinati separatamente. Gli utensili indicati con “N...” vengono utilizzati senza supporto.

Les supports de serrage ont un angle d'inclinaison de 1,5°. Vous trouverez les assises pour d'autres angles d'inclinaison à aux pages 722–723. Elles sont à commander séparément. Les supports de serrage portant l'appellation « N.. » sont utilisés sans assise

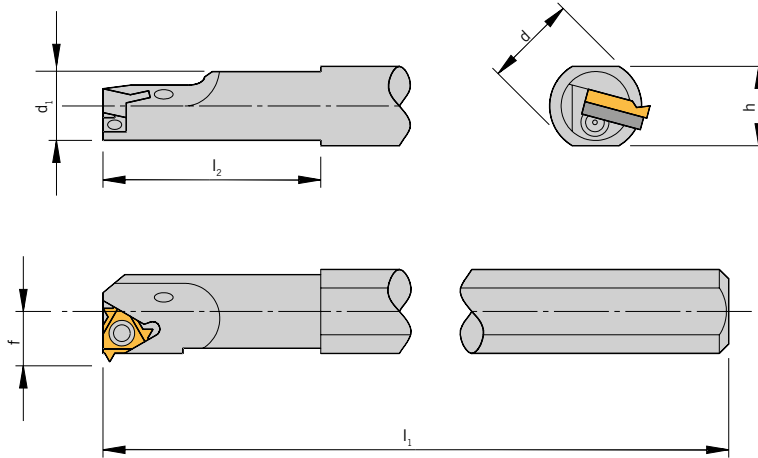


Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite + bussola per supporto<br>Vis de blocage | Screw + washer for support pad<br>Vite + bussola per supporto<br>Vis + rondelle pour cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|---|---|----------------------|---|---|
| 111...                                   | SN2T  | -   | KS 1751              | -   | -   |
| 161... <sup>1)</sup>                     | SA3T  | SY3T  | KS 2510              | YE3   | YI3   |
| 221... <sup>2)</sup>                     | SA4T  | SY4T  | KS 2520              | YE4   | YI4   |
| 271...                                   | SA5T  | SY5T  | KS 2525              | YE5   | YI5   |

**!** 1) NVR 16-3L/R use insert screw SN3T / 1) NVR 16-3L/R richiede la vite di serraggio SN3T / 1) NVR 16-3L/R nécessitent la vis de serrage SN3T  
2) NVR 20-4L/R use insert screw SN4T / 2) NVR 20-4L/R richiede la vite di serraggio SN4T / 2) NVR 20-4L/R nécessitent la vis de serrage SN4T

Internal thread / Filettatura interna / Filetage intérieur



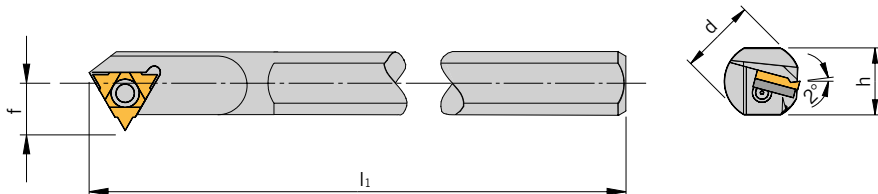
Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | h  | l <sub>1</sub> | l <sub>2</sub> | f    | d  | d <sub>1</sub> | Degrees<br>Grado<br>Degré | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|------|----|----------------|---------------------------|-----------------------------|
| NVRC 10-2 156/001R                 | 18 | 180            | 25             | 6,53 | 20 | 10,1           | 3,0                       | 11l...                      |
| NVRC 13-3 156/006R                 | 18 | 180            | 32             | 9,05 | 20 | 13,0           | 4,0                       | 16l...                      |
| NVRC 13-3 156/016R                 | 18 | 180            | 34             | 8,90 | 20 | 13,8           | 2,5                       | 16l...                      |

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Key<br>Chiave<br>Clé |
|--|--|----------------------|
| 11l...                                   | SN2T   | KS 1751              |
| 16l...                                   | SN3T   | KS 2510              |

Internal thread / Filettatura interna / Filetage intérieur



Holders / Utensili / Porte-outils

| Designation<br>Articolo<br>Article | h  | l <sub>1</sub> | l <sub>2</sub> | f    | d  | d <sub>1</sub> | Min. bore dia.<br>Diametro<br>preforo min.<br>Avant-trou min. | Insert<br>Insero<br>Insert |
|------------------------------------|----|----------------|----------------|------|----|----------------|---|----------------------------|
| AVR 32-4UL/R                       | 29 | 250            | 60             | 25,5 | 32 | 32             | 42  | 22UI...                    |
| AVR 40-4UL/R                       | 36 | 300            | 60             | 29,5 | 40 | 40             | 51  | 22UI...                    |
| AVR 50-5UL/R                       | 45 | 350            | 75             | 34,3 | 50 | 50             | 63  | 27UI...                    |
| NVR 32-5UL/R                       | 29 | 250            | 60             | 24,7 | 32 | 32             | 42  | 27UI...                    |

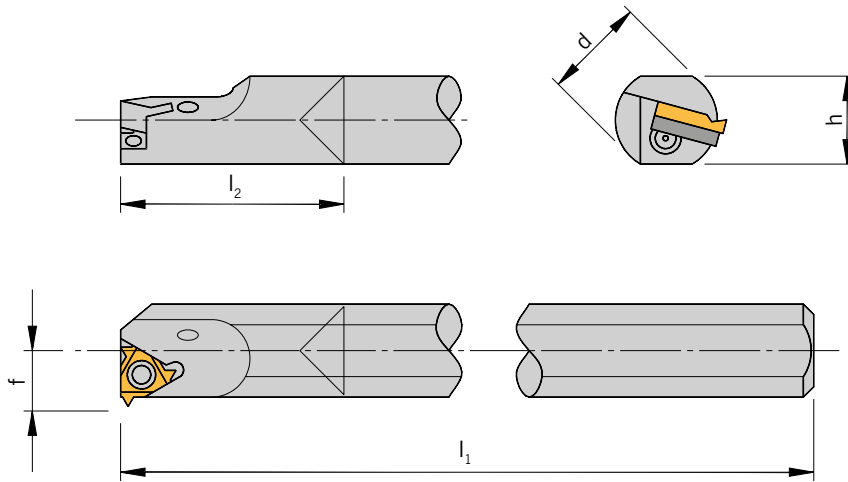
**!** All toolholders are supplied with a helix angle of 1.5°. Tool holders designated with „N..“ are used without support pad.  
 Gli utensili sono studiati per un angolo di elica di 1,5°. Utensili identificati con “N..” vengono forniti senza supporto.  
 Les porte-outils ont un angle d'inclinaison de 1,5°. Les porte-outils portant l'appellation « N.. » sont utilisés sans assise

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Insero<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|---|--|--|----------------------|---|---|
| 22UI...                                 | SA4T   | SY4T   | KS 2520              | YE4U  | YI4U  |
| 27UI...                                 | SA5T   | SY5T   | KS 2525              | YE5U  | YI5U  |

**Internal thread / Filettatura interna / Filetage intérieur**

**Type Standard with carbide shank / Esecuzione Standard con stelo in metallo duro /**  
Version standard avec queue en carbure



**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | h    | l <sub>1</sub> | l <sub>2</sub> | f    | d  | Min. bore dia.<br>Diametro<br>preforo min.<br>Avant-trou min. | Insert<br>Inserto<br>Insert |
|------------------------------------|------|----------------|----------------|------|----|---|-----------------------------|
| CAVRC 20-3L/R                      | 19,5 | 250            | 35             | 13,4 | 20 | 24  | 16L...                      |
| CNVRC 10-2L/R                      | 9,5  | 150            | 19             | 7,3  | 10 | 13  | 11L...                      |
| CNVRC 12-2L/R                      | 11,7 | 180            | 25             | 8,3  | 12 | 15  | 11L...                      |
| CNVRC 16-3L/R                      | 15,6 | 200            | 27             | 11,5 | 16 | 20  | 16L...                      |
| CNVRC 20-4L/R                      | 19,5 | 250            | 35             | 13,8 | 20 | 25  | 22L...                      |

**!** The tool holders have a helix angle of 1.5°. Support pads for different helix angles are on pages 722–723 et seq. They must be ordered separately. Tool holders designated "N..." are used without blade support pad.

Gli utensili sono studiati per un angolo di elica di 1,5°. I supporti per altri angoli di inclinazione sono disponibili alle pagine 722–723. Questi devono essere ordinati separatamente. Gli adattatori indicati con "N..." vengono utilizzati senza supporto.

Les supports de serrage ont un angle d'inclinaison de 1,5°. Vous trouverez les assises pour d'autres angles d'inclinaison aux pages 722–723. Elles sont à commander séparément. Les supports de serrage portant l'appellation « N... » sont utilisés sans assise

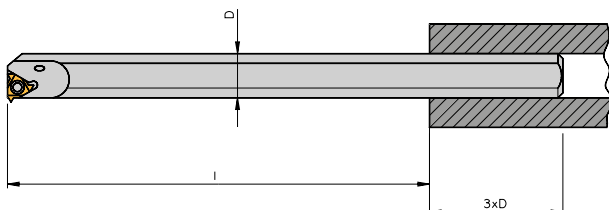
**Spare Parts / Ricambi / Pièces de rechange**

| For Insert<br>Per Inserto<br>Pour Insert | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé        | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|--|--|--|-----------------------------|---|---|
| 11L...                                   | SN2T   | -  | KS 1751                     | -   | -   |
| 16L... (d 16)                            | SN3T   | -  | KS 2510                     | -   | -   |
| 16L... (d 20)                            | SA3T   | SY3T   | KS 2510                     | YI3   | YE3   |
| 22L...                                   | SN4T   | -  | Klemmvorrichtung<br>KS 2520 | -   | -   |

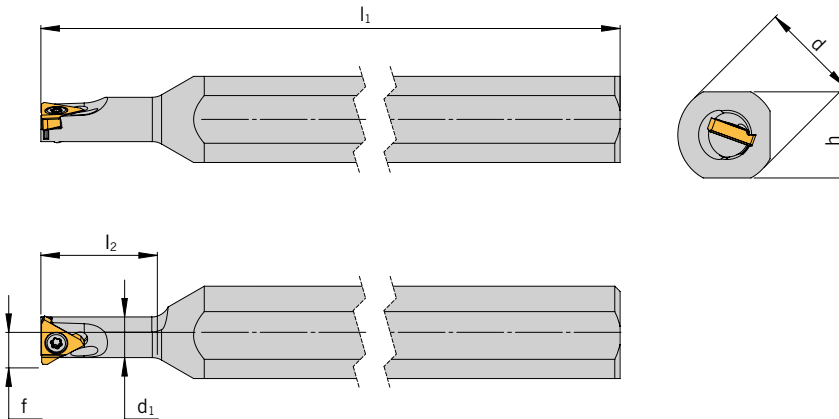
**!** REMARK: Tool holders with carbide shank should be used when extra accuracy is required or when the bar length to bar diameter ratio exceeds 3 : 1. The overhang to bar diameter ratio should be as small as possible to eliminate possible vibrations. The minimum length in the clamping device should be 3 times the diameter of the bar.

NOTA: Utensili con stelo in metallo duro vanno utilizzati nei casi in cui è richiesta maggiore precisione o quando lo stelo utensile sporge oltre ad un rapporto l : D superiore a 3 : 1. La sporgenza va comunque sempre ridotta al minimo per evitare possibilità di vibrazioni. La parte nel portautensile deve sempre essere minimo 3 volte il diametro dello stelo.

REMARQUE : Support de serrage avec tige en carbure monobloc pour une stabilité maximale lors de filetages intérieurs. Utilisation conseillée avec une grande longueur de dépassement du support, supérieure à 3 x le diamètre de la tige. Veiller à maintenir la longueur de dépassement aussi courte que possible afin d'éviter les vibrations. La longueur minimale de l'outil dans le support d'outils ne doit pas être inférieure à 3 x le diamètre de la tige.



Internal thread / Filettatura interna / Filetage intérieur



Holders / Utensili / Porte-outils

Boring bars - With steel shank / Bareni - Con stelo in acciaio / Barres d'alésage - Avec tige en acier

| Designation<br>Articolo<br>Article | h  | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|----------------|-----------------------------|
| NVRC 7-5.0KL/R                     | 15 | 125            | 18             | 16 | 6,6            | 5LKI...                     |

Holders / Utensili / Porte-outils

Boring bars - Steel shank with solid carbide core / Bareni - Stelo in acciaio con nocciolo in metallo duro / Barres d'alésage - Tige en acier avec noyau en carbure monobloc

| Designation<br>Articolo<br>Article | h   | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|-----|----------------|----------------|----|----------------|-----------------------------|
| BNVRC 10L-6.0KL/R <b>N</b>         | 9,4 | 110            | 43             | 10 | 8              | 6KI...                      |
| BNVRC 10M-6.0KL/R <b>N</b>         | 9,4 | 98             | 31             | 10 | 8              | 6KI...                      |
| BNVRC 10S-6.0KL/R <b>N</b>         | 9,4 | 89             | 22             | 10 | 8              | 6KI...                      |

Holders / Utensili / Porte-outils

Boring bars - With solid carbide shank / Bareni - Con stelo in metallo duro / Barres d'alésage - Avec tige en carbure monobloc

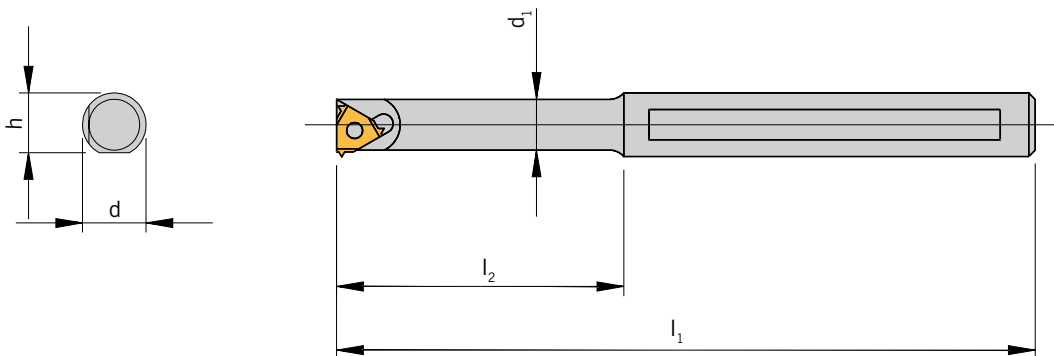
| Designation<br>Articolo<br>Article | h | l <sub>1</sub> | l <sub>2</sub> | d | d <sub>1</sub> | min. core hole<br>Diametro<br>preforo min.<br>avant-trou min. | Insert<br>Inserto<br>Insert |
|------------------------------------|---|----------------|----------------|---|----------------|---|-----------------------------|
| CNVRC 7-5.0KL/R                    | 7 | 125            | 31             | 8 | -              | 6,6   | 5LKI...                     |

**!** All toolholders designated with „B..“ and „C..“ are supplied with a carbide center in order to minimize vibration.  
Utensili con Articolo „B..“ e „C..“ hanno un nucleo in metallo duro per ridurre le vibrazioni.  
Les articles comportant un « B » ou un « C » ont un noyau en carbure pour réduire les vibrations.

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto<br>Pour Insert | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--|----------------------|----------------------|
| 5LKI...                                  | SN5LT                | KS 2505              |
| 6KI...                                   | SN6TM                | KS 1886              |

Internal thread / Filettatura interna / Filetage intérieur



Holders / Utensili / Porte-outils

Boring bars - Adjustable shank / Bareni - Stelo regolabile / Barres d'alésage - tige réglable

| Designation<br>Articolo<br>Article | h    | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|------|----------------|----------------|----|----------------|-----------------------------|
| BNVRC 8.0T-6.0KR                   | 15,6 | 100            | 8              | 16 | 8              | 6KI...                      |

Holders / Utensili / Porte-outils

Boring bars - With steel shank / Bareni - Con stelo in acciaio / Barres d'alesage - Avec tige en acier

| Designation<br>Articolo<br>Article | h    | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br>Inserto<br>Insert |
|------------------------------------|------|----------------|----------------|----|----------------|-----------------------------|
| SNVRC 12U-6.0KL/RH                 | 11,4 | 82             | 16             | 12 | 8              | 6KI...                      |

Spare Parts / Ricambi / Pièces de rechange

| For Insert<br>Per Inserto | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Cle |
|---------------------------|----------------------|----------------------|
| 6KI...                    | SN6TM                | KS 1886              |

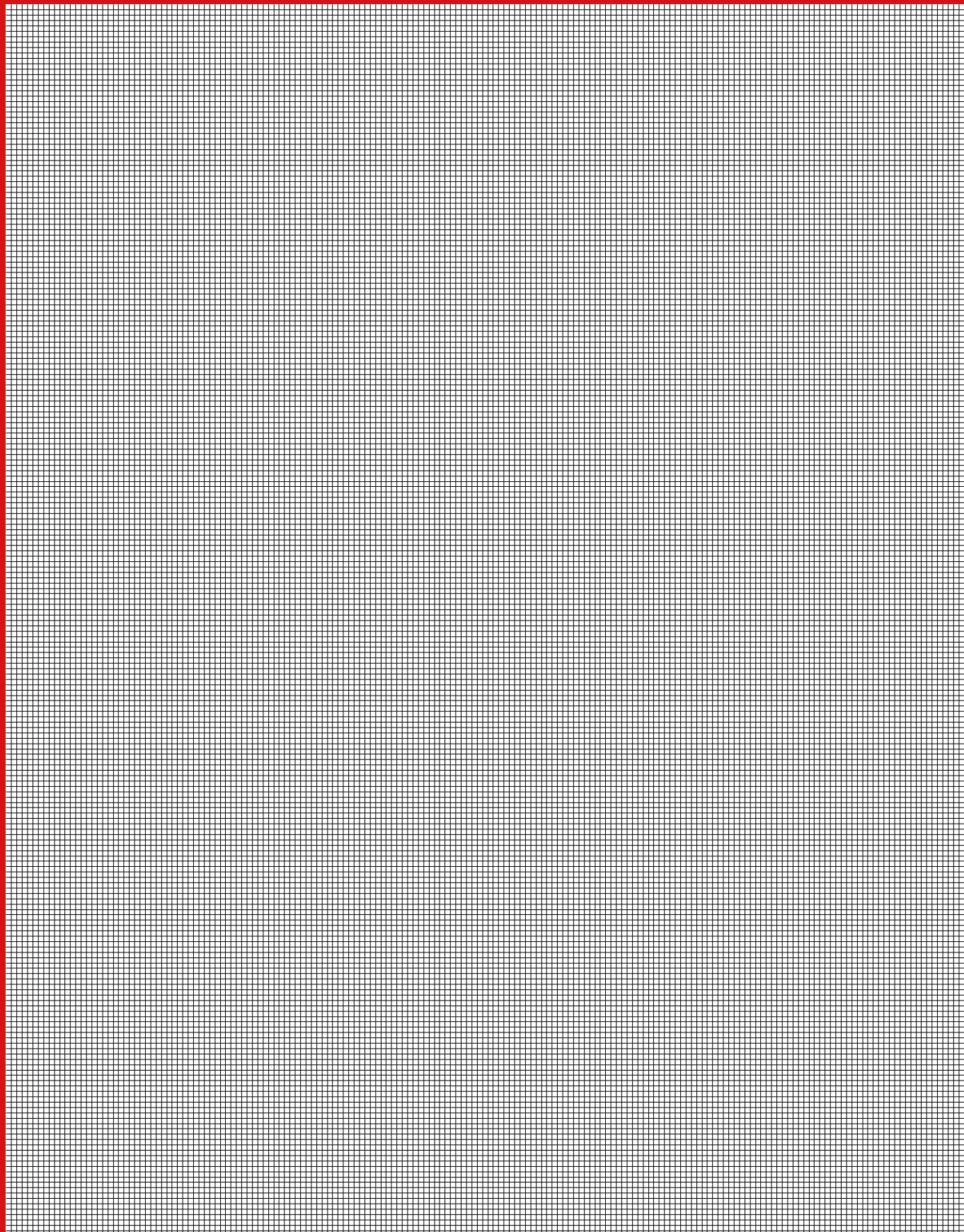
**For more information see**

*Per maggiori informazioni visita il sito*

Vous trouverez de plus amples informations sur

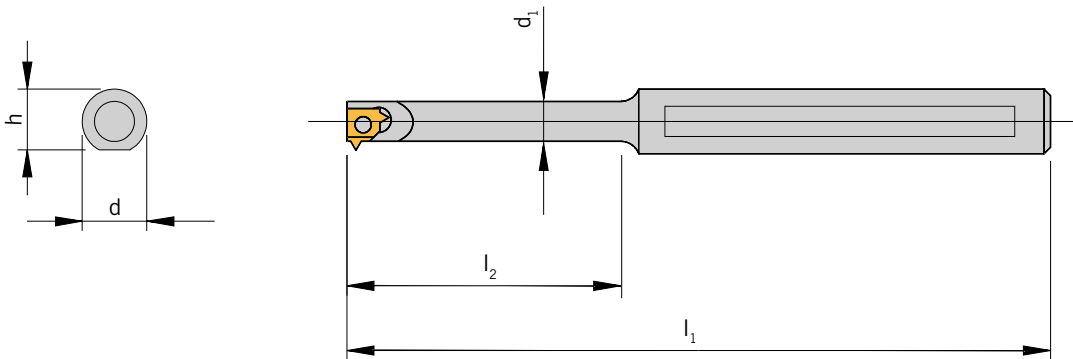


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Internal thread / *Filettatura interna* / Filetage intérieur



HOLDERS / *Utensili* / Porte-outils

Boring bars - Steel shank with solid carbide core / *Barni - Stelo in acciaio con nocciolo in metallo duro* / Barres d'alésage - Tige en acier avec noyau en carbure monobloc

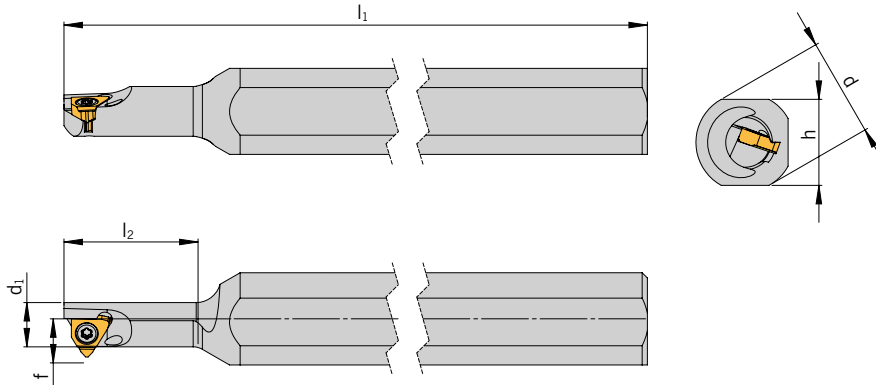
| Designation<br><i>Articolo</i><br>Article | h   | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br><i>Inserto</i><br>Insert |
|---|-----|----------------|----------------|----|----------------|------------------------------------|
| BNVRC 10L-5LKL/R                          | 9,4 | 109            | 43             | 10 | 6,2            | 5LKL...                            |
| BNVRC 10M-5LKL/R                          | 9,4 | 97             | 31             | 10 | 6,2            | 5LKL...                            |
| BNVRC 10S-5LKL/R                          | 9,4 | 87             | 22             | 10 | 6,2            | 5LKL...                            |

Spare Parts / *Ricambi* / Pièces de rechange

| For Insert<br><i>Per Inserto</i><br>Pour Insert | Clamping screw<br><i>Vite di bloccaggio</i><br>Vis de blocage | Key<br><i>Chiave</i><br>Clé |
|---|---|-----------------------------|
| 5LKL...   | SN5LT   | KS 2505                     |

**Internal thread / Filettatura interna / Filetage intérieur**

**Type Standard with carbide shank / Esecuzione Standard con stelo in metallo duro /**  
Version standard avec queue en carbure



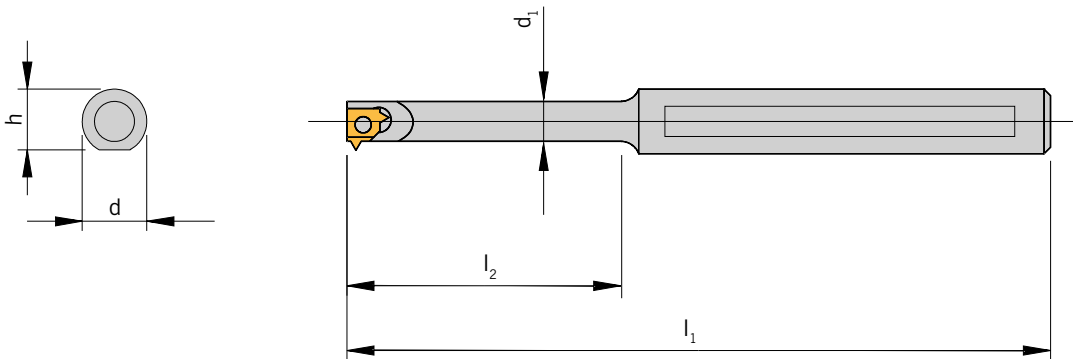
**Holders / Utensili / Porte-outils**

| Designation<br>Articolo<br>Article | h  | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Min. bore dia.<br>Diametro<br>preforo min.<br>Avant-trou min. | Insert<br>Inserto<br>Insert |
|------------------------------------|----|----------------|----------------|----|----------------|---|-----------------------------|
| CNVR 8-5.0KUL/R                    | 7  | 125            | 35             | 8  | -              | 7,3   | 5LKI...                     |
| NVRC 8-5.0KUL/R                    | 15 | 125            | 21             | 16 | 7,3            | -   | 5LKI...                     |

**Spare Parts / Ricambi / Pièces de rechange**

| For Insert<br>Per Inserto<br>Pour Insert | Screw<br>Vite<br>Vis | Key<br>Chiave<br>Clé |
|--|----------------------|----------------------|
| 5LKI...                                  | SN5LT                | KS 2505              |

Internal thread / *Filettatura interna* / Filetage intérieur



**N** NEW/NUOVO/  
NOUVEAU

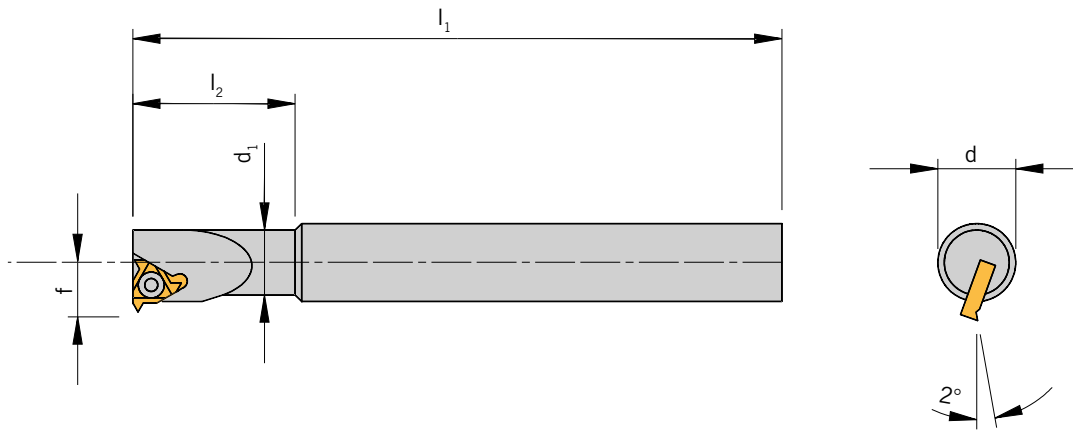
HOLDERS / *Utensili* / Porte-outils

| Designation<br><i>Articolo</i><br>Article | h    | l <sub>1</sub> | l <sub>2</sub> | d  | d <sub>1</sub> | Insert<br><i>Inserto</i><br>Insert |
|---|------|----------------|----------------|----|----------------|------------------------------------|
| <b>BNVRC 6.2T-5LKR</b>                    | 15,6 | 100            | 8              | 16 | 6,2            | 5LKL...                            |

Spare Parts / *Ricambi* / Pièces de rechange

| For Insert<br><i>Per Inserto</i><br>Pour Insert | Clamping screw for holder<br><i>Vite di serraggio per supporto</i><br>Vis de serrage pour support | Key for holder<br><i>Chiave per supporto</i><br>Clé pour support | Clamping screw for sleeve<br><i>Vite di bloccaggio per bussola</i><br>Vis de serrage pour douille | Key for sleeve<br><i>Chiave per bussola</i><br>Clé pour douille |
|---|---|--|---|---|
| 5LKL...   | SN5LT   | KS 2505  | S4.0  | KP 3421   |

External and Internal thread / *Filettatura interna ed esterna* / Filetage extérieur et intérieur



Holders / *Utensili* / Porte-outils

| Designation<br><i>Articolo</i><br>Article | $l_1$ | $l_2$ | $f$ | $d$ | $d_1$ | min. core hole<br><i>Diametro preforo min.</i><br>avant-trou min. | Insert<br><i>Inserto</i><br>Insert |
|---|-------|-------|-----|-----|-------|---|------------------------------------|
| OVR 12-2L/R                               | 100   | 25    | 7,4 | 12  | 10    | 13  | 11E.../11I...                      |
| OVR 15-2L/R                               | 100   | 32    | 8,9 | 15  | 13    | 16  | 11E.../11I...                      |
| OVR 16D-2L/R                              | 100   | 32    | 8,9 | 16  | 13    | 16  | 11E.../11I...                      |

**!** Remark: Mini holders on round or square execution are designated for use on automatic lathes for the optical and other precision industries. They can be used for external and internal threading.  
*Nota: Utensili Mini a stelo quadro e cilindrico sono studiati per un utilizzo su torni a fantina mobile per l'industria di precisione. Possono venire utilizzati sia per filettatura esterna che interna.*  
 Remarque : les porte-outils à queue cylindrique ou rectangulaire sont spécialement conçus pour les tours utilisés dans l'industrie optique et pour la mécanique de précision. Les porte-outils peuvent être utilisés pour un filetage intérieur ou extérieur

Spare Parts / *Ricambi* / Pièces de rechange

| For Insert<br><i>Per Inserto</i><br>Pour Insert | Clamping screw<br><i>Vite di bloccaggio</i><br>Vis de blocage | Key<br><i>Chiave</i><br>Clé |
|---|---|-----------------------------|
| 11E.../11I...                                   | SN2T  | KS 1751                     |

|  |    |    |    |    |
|--|----|----|----|----|
| Thread / <i>Filetto vite</i> / Filetage              | ER | EL | IR | IL |
| Insert / <i>Inserto</i> / <i>Plaquette</i>           | ER | EL | IR | IL |
| Holder / <i>Utensili</i> / <i>Porte-outils mini.</i> | L  | R  | R  | L  |

E = External / I = Internal / R = Right / L = Left. The helix angle is 0.5 degree.  
 E = esterna / I = interna / R = destra / L = sinistra. L'angolo di inclinazione è 0.5 degree.  
 E = extérieur / I = intérieur / R = droite / L = gauche. L'angle d'inclinaison est de 0.5°

## AL-IK-UN on KMH01 - Style B / AL-IK-UN su KMH01 - Forma B / AL-IK-UN sur KMH01 - Forme B

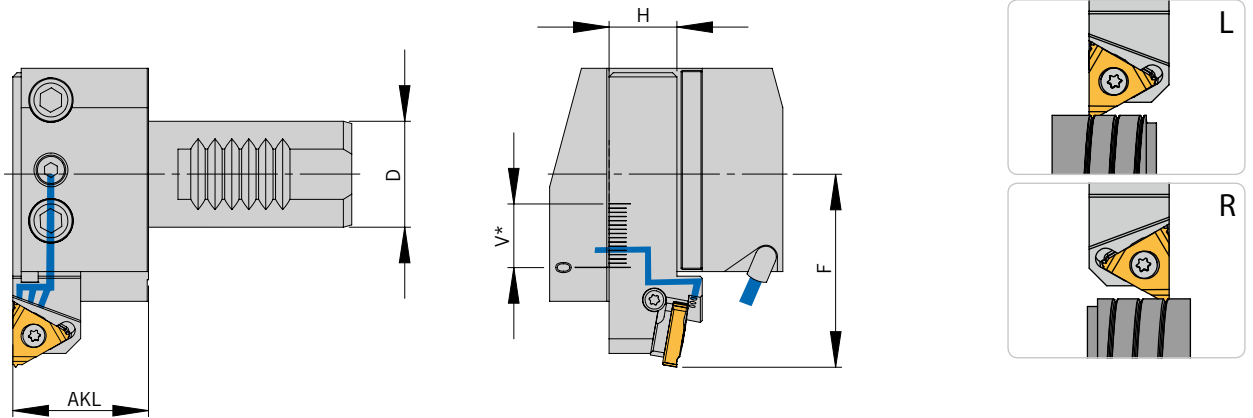


Table 1 / Tabella 1 / Table 1

### Basic holders / Adattatori / Porte-outils de base

| Form<br>Forma<br>Forme | VDI | H  | Designation<br>Articolo (adattatore)<br>Article | Designation<br>Articolo (Utensile)<br>Article | AKL | F    | V* | Indexable insert<br>Inserto a fissaggio meccanico<br>Plaque de coupe amovibles |
|------------------------|-----|----|---|---|-----|------|----|--|
| B1                     | 20  | 16 | KMH01-B1-20X16X30-IK                            | AL16-3-L-IK-UN                                | 32  | 45.5 | 15 | 16E..  |
|                        | 25  | 16 | KMH01-B1-25X16X30-IK                            | AL16-3-L-IK-UN                                | 32  | 45.5 | 15 | 16E..  |
|                        | 30  | 20 | KMH01-B1-30X20X40-IK                            | AL20-3-L-IK-UN                                | 42  | 47.5 | 17 | 16E..  |
|                        | 40  | 25 | KMH01-B1-40X25X44-IK                            | AL25-3-L-IK-UN                                | 47  | 52.5 | 22 | 16E..  |
| B2                     | 25  | 16 | KMH01-B2-25X16X30-IK                            | AL16-3-R-IK-UN                                | 32  | 45.5 | 15 | 16E..  |
|                        | 30  | 20 | KMH01-B2-30X20X40-IK                            | AL20-3-R-IK-UN                                | 42  | 47.5 | 17 | 16E..  |
| B3                     | 40  | 25 | KMH01-B2-40X25X44-IK                            | AL25-3-R-IK-UN                                | 47  | 52.5 | 22 | 16E..  |
|                        | 25  | 16 | KMH01-B3-25X16X30-IK                            | AL16-3-R-IK-UN                                | 32  | 45.5 | 15 | 16E..  |
|                        | 30  | 20 | KMH01-B3-30X20X40-IK                            | AL20-3-R-IK-UN                                | 42  | 47.5 | 17 | 16E..  |
| B4                     | 40  | 25 | KMH01-B3-40X25X44-IK                            | AL25-3-R-IK-UN                                | 47  | 52.5 | 22 | 16E..  |
|                        | 25  | 16 | KMH01-B4-25X16X30-IK                            | AL16-3-L-IK-UN                                | 32  | 45.5 | 15 | 16E..  |
|                        | 30  | 20 | KMH01-B4-30X20X40-IK                            | AL20-3-L-IK-UN                                | 42  | 47.5 | 17 | 16E..  |
|                        | 40  | 25 | KMH01-B4-40X25X44-IK                            | AL25-3-L-IK-UN                                | 47  | 52.5 | 22 | 16E..  |

\* The holder be adjusted forward bei the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „F“ dimension changes accordingly.





\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.

\* Il est possible de régler le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « F » varie en conséquence.

## 9 Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|-----------------------------------|--|--|----------------------|---|---|
| 16E..                             | SA3T   | SY3T   | KS 2510              | YE3   | YI3   |

## Assembly options / Combinazioni di montaggio / Options d'assemblage

| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH (VDI) avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec l'outil approprié |   |
|---|---|--|---|
| KMH01-B1-...-IK   | KMH01-B4-...-IK   | KMH01-B2-...-IK  | KMH01-B3-...-IK   |
|    |    |                                      |  |
| <b>Normal assembly</b><br>Montaggio normale<br>Assemblage normal  | <b>Upside down assembly</b><br>Montaggio invertito<br>Position de montage retournée | <b>Normal assembly</b><br>Montaggio normale<br>Assemblage normal   | <b>Upside down assembly</b><br>Montaggio invertito<br>Position de montage retournée |

## AL-IK-UN on KMH01 - Style C / AL-IK-UN su KMH01 - Forma C / AL-IK-UN sur KMH01 - Forme C

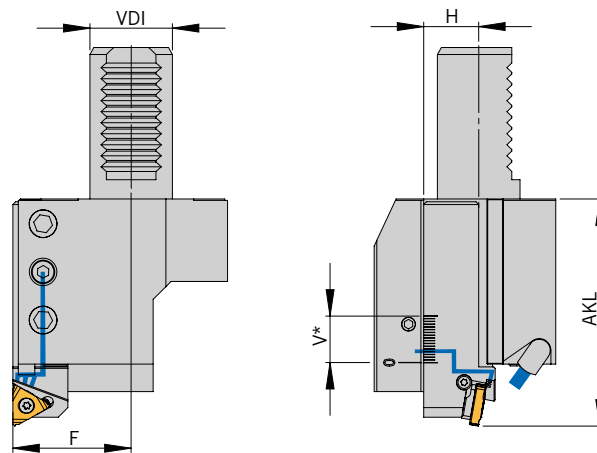
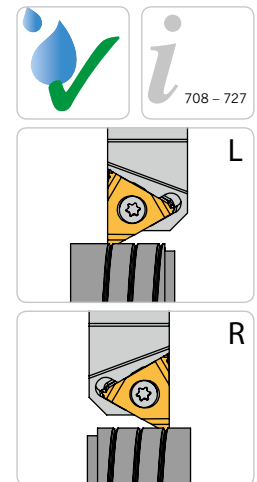


Table 1 / Tabella 1 / Table 1

### Basic holders / Adattatori / Porte-outils de base

| Form<br>Forma<br>Forme | VDI | H  | Designation<br>Articolo<br>Article | Designation<br>Articolo<br>Article | AKL  | F    | V* | Indexable insert<br>Insero a fissaggio meccanico<br>Plaquelette de coupe amovibles |
|------------------------|-----|----|------------------------------------|------------------------------------|------|------|----|--|
| C1                     | 20  | 16 | KMH01-C1-20X16X30-IK               | AL16-3-L-IK-UN                     | 70,5 | 35   | 15 | 16E..  |
|                        | 30  | 20 | KMH01-C1-30X20X70-IK               | AL20-3-L-IK-UN                     | 82,5 | 37   | 17 | 16E..  |
|                        | 40  | 25 | KMH01-C1-40X25X85-IK               | AL25-3-L-IK-UN                     | 95,0 | 46   | 22 | 16E..  |
| C2                     | 25  | 16 | KMH01-C2-25X16X55-IK               | AL16-3-R-IK-UN                     | 70,5 | 35   | 15 | 16E..  |
|                        | 30  | 20 | KMH01-C2-30X20X70-IK               | AL20-3-R-IK-UN                     | 82,5 | 43   | 17 | 16E..  |
| C3                     | 40  | 25 | KMH01-C2-40X25X85-IK               | AL25-3-R-IK-UN                     | 95,0 | 50,5 | 22 | 16E..  |
|                        | 25  | 16 | KMH01-C3-25X16X55-IK               | AL16-3-R-IK-UN                     | 70,5 | 35   | 15 | 16E..  |
|                        | 30  | 20 | KMH01-C3-30X20X70-IK               | AL20-3-R-IK-UN                     | 82,5 | 37   | 17 | 16E..  |
| C4                     | 40  | 25 | KMH01-C3-40X25X85-IK               | AL25-3-R-IK-UN                     | 95,0 | 46   | 22 | 16E..  |
|                        | 25  | 16 | KMH01-C4-25X16X55-IK               | AL16-3-L-IK-UN                     | 70,5 | 35   | 15 | 16E..  |
|                        | 25  | 20 | KMH01-C4-25X20X70-IK               | AL20-3-L-IK-UN                     | 82,5 | 39   | 17 | 16E..  |
|                        | 30  | 20 | KMH01-C4-30X20X70-IK               | AL20-3-L-IK-UN                     | 82,5 | 43   | 17 | 16E..  |
|                        | 40  | 25 | KMH01-C4-40X25X85-IK               | AL25-3-L-IK-UN                     | 95,0 | 50,5 | 22 | 16E..  |

\* The holder be adjusted forward by the „V“ value. The coolant flow is guaranteed according to the adjustment range. The „AKL“ dimension changes accordingly.

\* L'utensile può essere estratto del valore „V“. Il passaggio del refrigerante viene garantito all'interno del campo di registrazione. La dimensione „F“ cambia di conseguenza.





\* Il est possible de régler le support vers l'avant du logement VDI sur une distance égale à la valeur « V ». L'alimentation en fluide de refroidissement est assurée en fonction du réglage. La dimension « AKL » varie en conséquence.

# 9

## Spare Parts / Ricambi / Pièces de rechange

| Holder<br>Utensile<br>Porte-Outil | Clamping screw<br>Vite di bloccaggio<br>Vis de blocage | Screw + washer<br>for support pad<br>Vite + bussola<br>per supporto<br>Vis + rondelle pour<br>cale-support | Key<br>Chiave<br>Clé | Support pad R<br>Supporto R<br>Cale-support R | Support pad L<br>Supporto L<br>Cale-support L |
|-----------------------------------|--|--|----------------------|---|---|
| 16E..                             | SA3T   | SY3T   | KS 2510              | YE3   | YI3   |

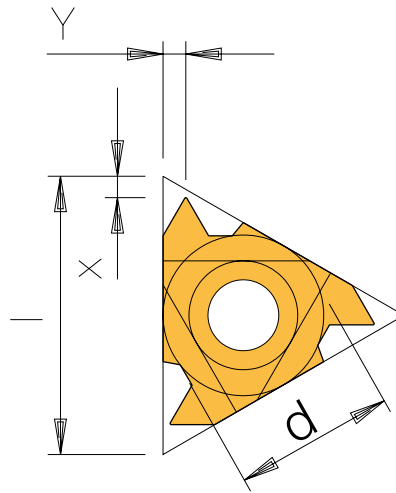
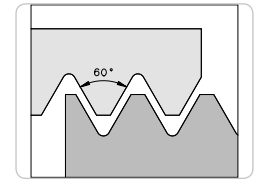
## Assembly options / Combinazioni di montaggio / Options d'assemblage

| Holder KMH (VDI) with left-hand holder<br>Adattatore KMH con utensile sinistro<br>Adaptateur KMH (VDI) avec porte-outils à gauche |   | Holder KMH (VDI) with right-hand holder<br>Adattatore KMH con utensile destro<br>Adaptateur KMH avec l'outil approprié |   |
|---|---|--|---|
| KMH01-C2-...-IK   | KMH01-C3-...-IK   | KMH01-C1-...-IK  | KMH01-C4-...-IK   |
|    |  |                                      |  |
| Upside down assembly<br>Montaggio invertito<br>Position de montage retournée  | Normal assembly<br>Montaggio normale<br>Assemblage normal                         | Normal assembly<br>Montaggio normale<br>Assemblage normal  | Upside down assembly<br>Montaggio invertito<br>Position de montage retournée        |



## External thread / Filettatura esterna / Filetage extérieur

Partial profile 60° / Profilo parziale 60° / Profil partiel 60°



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d      | r    | x   | y   | HC    | HC    | HU   |
|------------------------------------|--|--|----|--------|------|-----|-----|-------|-------|------|
|                                    |  |  |    |        |      |     |     | AL100 | AM15C | AK20 |
| 16ER-T-A60                         | 0,50 - 1,5                                 | 48 - 16  | 16 | 9,525  | 0,05 | 0,8 | 0,9 | ◆     |       | ◆    |
| 16ER-T-AG60                        | 0,50 - 3,0                                 | 48 - 8   | 16 | 9,525  | 0,08 | 1,2 | 1,7 | ◆     | ◆     | ◆    |
| 16ER-T-G60                         | 1,75 - 3,0                                 | 14 - 8   | 16 | 9,525  | 0,27 | 1,2 | 1,7 | ◆     |       |      |
| 22ER-T-N60                         | 3,50 - 5,0                                 | 7 - 5  | 22 | 12,700 | 0,53 | 1,7 | 2,5 | ◆     |       |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

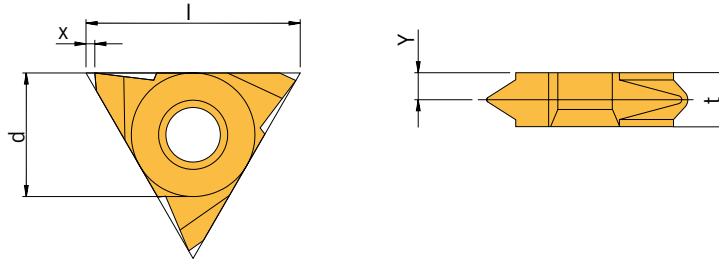
|   |   |   |   |
|---|---|---|---|
| P | ● | ○ |   |
| M | ● | ● |   |
| K | ○ |   | ● |
| N |   |   | ● |
| S | ○ |   |   |
| H |   |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Partial profile 60° / Profilo parziale 60° / Profil partiel 60°



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm | Pitch<br>inch | l  | d      | r    | x   | y   | t   | HC    |
|------------------------------------|-------------|---------------|----|--------|------|-----|-----|-----|-------|
|                                    | Passo<br>mm | Passo<br>inch |    |        |      |     |     |     | AL100 |
| <b>16VER-T-AG60</b>                | 0,5 - 3     | 48 - 8        | 16 | 9,525  | 0,08 | 1,1 | 1,9 | 3,6 | ◆     |
| <b>22VER-T-N60</b>                 | 3,5 - 5     | 7 - 5         | 22 | 12,700 | 0,53 | 1,1 | 2,3 | 4,8 | ◆     |

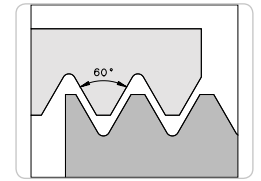
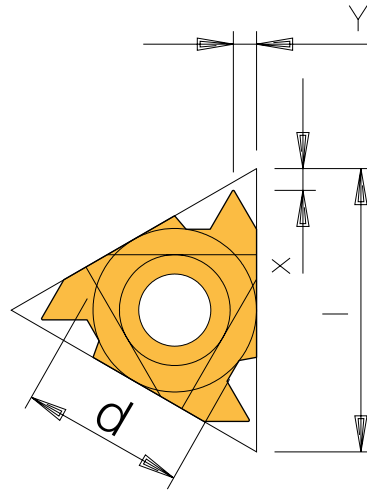
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

### Partial profile 60° / Profilo parziale 60° / Profil partiel 60°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d    | r   | x   | y   | HC    |
|------------------------------------|--|--|----|------|-----|-----|-----|-------|
|                                    |  |  |    |      |     |     |     | AL100 |
| 22IL-T-N60                         | 3,5 - 5                                    | 7 - 5  | 22 | 12,7 | 0,3 | 1,7 | 2,5 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d      | r    | x   | y   | HC    | HU   |
|------------------------------------|--|--|----|--------|------|-----|-----|-------|------|
|                                    |  |  |    |        |      |     |     | AL100 | AK20 |
| 11IR-T-A60                         | 0,5 - 1,5                                  | 48 - 16  | 11 | 6,350  | 0,05 | 0,8 | 0,9 | ◆     | ◆    |
| 16IR-T-AG60                        | 0,5 - 3,0                                  | 48 - 8   | 16 | 9,525  | 0,05 | 1,2 | 1,7 | ◆     | ◆    |
| 22IR-T-N60                         | 3,5 - 5,0                                  | 7 - 5  | 22 | 12,700 | 0,30 | 1,7 | 2,5 | ◆     | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● |   |
| K | ○ | ● |
| N | ○ | ● |
| S | ○ |   |
| H | ○ |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

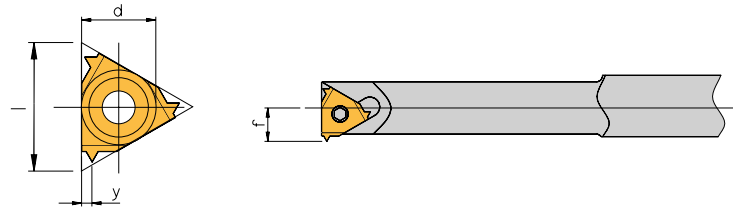
9

## Internal thread / Filettatura interna / Filetage intérieur

### Partial profile 60° / Profilo parziale 60° / Profil partiel 60°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



#### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | r    | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|--|----|---|------|-----|-----|------------------|-------|
| 6KIL-T-A60                         | 0,5 - 1,5                                  | 48 - 16  | 10 | 6 | 0,05 | 0,9 | 5,3 | 10               | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

#### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | r    | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|--|----|---|------|-----|-----|------------------|-------|-------|
| 6KIR-T-A60                         | 0,5 - 1,5                                  | 48 - 16  | 10 | 6 | 0,05 | 0,9 | 5,3 | 10               | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

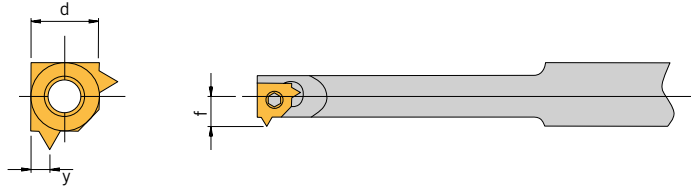
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Partial profile 60° / Profilo parziale 60° / Profil partiel 60°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | r    | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|--|---|------|-----|------|------------------|-------|
| 5LKIL-T-A60                        | 0,5 - 1,5                                  | 48 - 16  | 5 | 0,05 | 0,9 | 4,65 | 8                | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | r    | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|--|---|------|-----|------|------------------|-------|-------|
| 5LKIR-T-A60                        | 0,5 - 1,5                                  | 48 - 16  | 5 | 0,05 | 0,9 | 4,65 | 8                | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

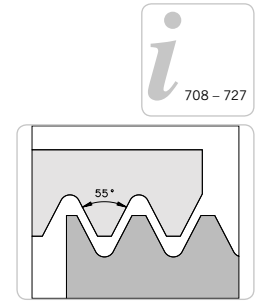
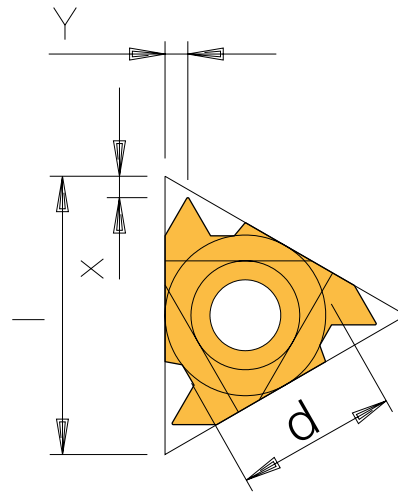
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

9

## External thread / Filettatura esterna / Filetage extérieur

Partial profile 55° / Profilo parziale 55° / Profil partiel 55°



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm | Pitch<br>inch | l  | d     | r    | x   | y   | HC    | HU   |
|------------------------------------|-------------|---------------|----|-------|------|-----|-----|-------|------|
|                                    | Passo<br>mm | Passo<br>inch |    |       |      |     |     | AL100 | AK20 |
| <b>16ER-T-AG55</b>                 | 0,5 - 3     | 48 - 8        | 16 | 9,525 | 0,07 | 1,2 | 1,7 | ◆     | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

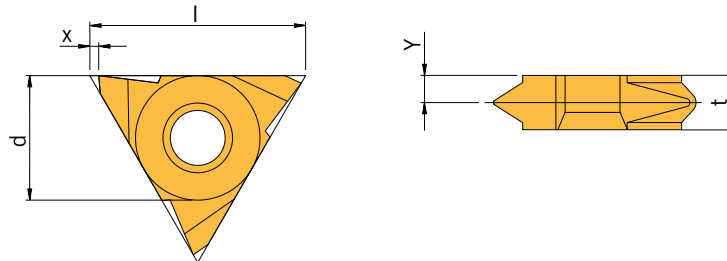
|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● |   |
| K | ○ | ● |
| N |   | ● |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

External thread / Filettatura esterna / Filetage extérieur

Partial profile 55° / Profilo parziale 55° / Profil partiel 55°



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm | Pitch<br>inch | l  | d     | r    | x   | y   | t   | HC    |
|------------------------------------|-------------|---------------|----|-------|------|-----|-----|-----|-------|
|                                    | Passo<br>mm | Passo<br>inch |    |       |      |     |     |     | AL100 |
| 16VER-T-AG55                       | 0,5 - 3     | 48 - 8        | 16 | 9,525 | 0,07 | 1,1 | 1,9 | 3,6 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S | ○ |
| H |   |

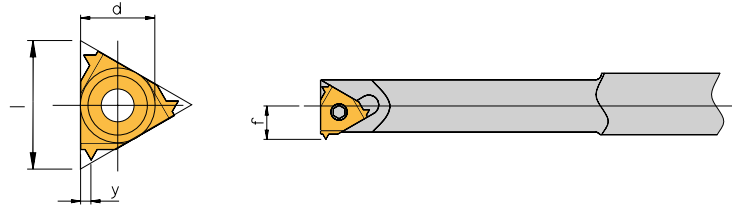
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Partial profile 55° / Profilo parziale 55° / Profil partiel 55°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | r    | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|--|----|---|------|-----|-----|------------------|-------|
| 6KIL-T-A55                         | 0,5 - 1,5                                  | 48 - 16  | 10 | 6 | 0,05 | 0,9 | 5,3 | 10               | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | r    | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|--|----|---|------|-----|-----|------------------|-------|-------|
| 6KIR-T-A55                         | 0,5 - 1,5                                  | 48 - 16  | 10 | 6 | 0,05 | 0,9 | 5,3 | 10               | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

9

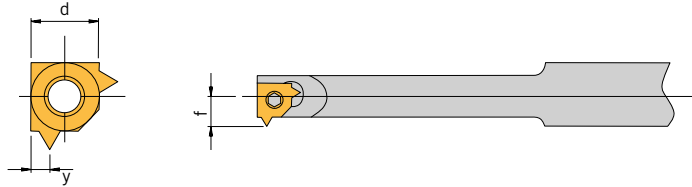


## Internal thread / Filettatura interna / Filetage intérieur

Partial profile 55° / Profilo parziale 55° / Profil partiel 55°



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | r    | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|--|---|------|-----|------|------------------|-------|
| 5LKIL-T-A55                        | 0,5 - 1,5                                  | 48 - 16  | 5 | 0,05 | 0,9 | 4,65 | 8                | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | r    | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|--|---|------|-----|------|------------------|-------|-------|
| 5LKIR-T-A55                        | 0,5 - 1,5                                  | 48 - 16  | 5 | 0,05 | 0,9 | 4,65 | 8                | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

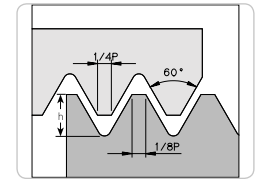
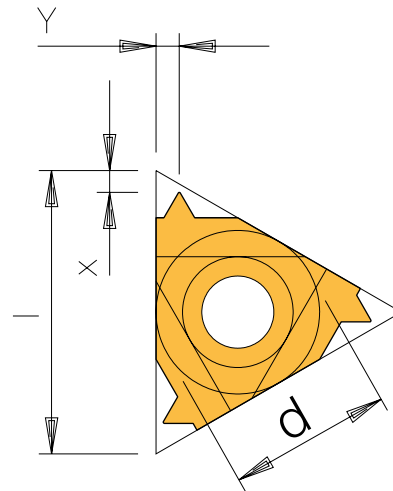
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

9

## External thread / Filettatura esterna / Filetage extérieur

Metric-ISO / Metrico-ISO / ISO métrique



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|
|                                    |  |    |       |                  |     |     | AL100 |
| 16EL-V-ISO0,75                     | 0,75                                       | 16 | 9,525 | 0,46             | 0,6 | 0,6 | ◆     |
| 16EL-V-ISO0,80                     | 0,80                                       | 16 | 9,525 | 0,49             | 0,6 | 0,6 | ◆     |
| 16EL-V-ISO1,00                     | 1,00                                       | 16 | 9,525 | 0,61             | 0,7 | 0,7 | ◆     |
| 16EL-V-ISO1,25                     | 1,25                                       | 16 | 9,525 | 0,77             | 0,8 | 0,9 | ◆     |
| 16EL-V-ISO1,50                     | 1,50                                       | 16 | 9,525 | 0,92             | 0,8 | 1,0 | ◆     |
| 16EL-V-ISO1,50-CB                  | 1,50                                       | 16 | 9,525 | 0,92             | 1,2 | 1,0 | ◆     |
| 16EL-V-ISO1,75                     | 1,75                                       | 16 | 9,525 | 1,07             | 0,9 | 1,2 | ◆     |
| 16EL-V-ISO2,00                     | 2,00                                       | 16 | 9,525 | 1,23             | 1,0 | 1,3 | ◆     |
| 16EL-V-ISO3,00                     | 3,00                                       | 16 | 9,525 | 1,84             | 1,2 | 1,6 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   | HC    | HU   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|-------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C | AM15C | AK20 |
| 11ER-V-ISO0,50                     | 0,50                                       | 11 | 6,350 | 0,31             | 0,6 | 0,4 | ◆     |      |       |      |
| 11ER-V-ISO1,50                     | 1,50                                       | 11 | 6,350 | 0,92             | 0,8 | 1,0 | ◆     |      |       |      |
| 16ER-V-ISO0,25                     | 0,25                                       | 16 | 9,525 | 0,14             | 0,4 | 0,2 | ◆     | ◆    |       |      |
| 16ER-V-ISO0,35                     | 0,35                                       | 16 | 9,525 | 0,21             | 0,8 | 0,4 | ◆     |      |       |      |
| 16ER-V-ISO0,40                     | 0,40                                       | 16 | 9,525 | 0,25             | 0,7 | 0,4 | ◆     |      |       |      |
| 16ER-V-ISO0,45                     | 0,45                                       | 16 | 9,525 | 0,28             | 0,7 | 0,4 | ◆     |      |       |      |
| 16ER-V-ISO0,50                     | 0,50                                       | 16 | 9,525 | 0,31             | 0,6 | 0,4 | ◆     |      |       | ◆    |
| 16ER-V-ISO0,50-CB                  | 0,50                                       | 16 | 9,525 | 0,31             | 1,2 | 0,4 | ◆     |      |       |      |
| 16ER-V-ISO0,60                     | 0,60                                       | 16 | 9,525 | 0,37             | 0,6 | 0,6 | ◆     |      |       |      |

Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d      | h <sub>min</sub> | x   | y   | HC    | HC            | HU   |
|------------------------------------|--|----|--------|------------------|-----|-----|-------|---------------|------|
|                                    |  |    |        |                  |     |     | AL100 | AM7C<br>AM15C | AK20 |
| 16ER-V-ISO0,70                     | 0,70                                       | 16 | 9,525  | 0,43             | 0,6 | 0,6 | ◆     |               |      |
| 16ER-V-ISO0,70-CB                  | 0,70                                       | 16 | 9,525  | 0,43             | 1,2 | 0,6 | ◆     |               |      |
| 16ER-V-ISO0,75                     | 0,75                                       | 16 | 9,525  | 0,46             | 0,6 | 0,6 | ◆     | ◆             | ◆    |
| 16ER-V-ISO0,75-CB                  | 0,75                                       | 16 | 9,525  | 0,46             | 1,2 | 0,6 | ◆     |               |      |
| 16ER-V-ISO0,80                     | 0,80                                       | 16 | 9,525  | 0,49             | 0,6 | 0,6 | ◆     | ◆             | ◆    |
| 16ER-V-ISO0,80-CB                  | 0,80                                       | 16 | 9,525  | 0,49             | 1,2 | 0,6 | ◆     |               |      |
| 16ER-V-ISO1,00                     | 1,00                                       | 16 | 9,525  | 0,61             | 0,7 | 0,7 | ◆     | ◆             | ◆    |
| 16ER-V-ISO1,00-CB                  | 1,00                                       | 16 | 9,525  | 0,62             | 1,2 | 0,7 | ◆     |               |      |
| 16ER-V-ISO1,25                     | 1,25                                       | 16 | 9,525  | 0,77             | 0,8 | 0,9 | ◆     | ◆             | ◆    |
| 16ER-V-ISO1,25-CB                  | 1,25                                       | 16 | 9,525  | 0,76             | 1,2 | 1,0 | ◆     |               |      |
| 16ER-V-ISO1,50                     | 1,50                                       | 16 | 9,525  | 0,92             | 0,8 | 1,0 | ◆     | ◆             | ◆    |
| 16ER-V-ISO1,50-CB                  | 1,50                                       | 16 | 9,525  | 0,92             | 1,2 | 1,0 | ◆     |               |      |
| 16ER-V-ISO1,75                     | 1,75                                       | 16 | 9,525  | 1,07             | 0,9 | 1,2 | ◆     | ◆             |      |
| 16ER-V-ISO1,75-CB                  | 1,75                                       | 16 | 9,525  | 1,15             | 1,2 | 1,0 | ◆     |               |      |
| 16ER-V-ISO2,00                     | 2,00                                       | 16 | 9,525  | 1,23             | 1,0 | 1,3 | ◆     | ◆             | ◆    |
| 16ER-V-ISO2,00-CB                  | 2,00                                       | 16 | 9,525  | 1,23             | 1,2 | 1,3 | ◆     |               |      |
| 16ER-V-ISO2,50                     | 2,50                                       | 16 | 9,525  | 1,53             | 1,1 | 1,5 | ◆     | ◆             |      |
| 16ER-V-ISO2,50-CB                  | 2,50                                       | 16 | 9,525  | 1,53             | 1,2 | 1,3 | ◆     |               |      |
| 16ER-V-ISO3,00                     | 3,00                                       | 16 | 9,525  | 1,84             | 1,2 | 1,6 | ◆     |               |      |
| 16ER-V-ISO3,00-CB                  | 3,00                                       | 16 | 9,525  | 1,84             | 1,2 | 1,6 | ◆     |               |      |
| 16ER-V-ISO3,50                     | 3,50                                       | 16 | 9,525  | 2,15             | 1,6 | 1,9 | ◆     |               |      |
| 16ER-V-ISO3,50-CB                  | 3,50                                       | 16 | 9,525  | 2,15             | 1,2 | 1,8 | ◆     |               |      |
| 22ER-V-ISO3,50                     | 3,50                                       | 22 | 12,700 | 2,15             | 1,6 | 2,3 | ◆     |               |      |
| 22ER-V-ISO3,50-CB                  | 3,50                                       | 22 | 12,700 | 2,15             | 2,0 | 2,5 | ◆     |               |      |
| 22ER-V-ISO4,00                     | 4,00                                       | 22 | 12,700 | 2,45             | 1,6 | 2,3 | ◆     |               |      |
| 22ER-V-ISO4,00-CB                  | 4,00                                       | 22 | 12,700 | 2,45             | 2,0 | 2,5 | ◆     |               |      |
| 22ER-V-ISO4,50                     | 4,50                                       | 22 | 12,700 | 2,76             | 1,7 | 2,4 | ◆     |               |      |
| 22ER-V-ISO4,50-CB                  | 4,50                                       | 22 | 12,700 | 2,76             | 2,0 | 2,5 | ◆     |               |      |
| 22ER-V-ISO5,00                     | 5,00                                       | 22 | 12,700 | 3,07             | 1,7 | 2,5 | ◆     |               |      |
| 22ER-V-ISO5,00-CB                  | 5,00                                       | 22 | 12,700 | 3,07             | 2,0 | 2,5 | ◆     |               |      |
| 22ER-V-ISO6,00-CB                  | 6,00                                       | 22 | 12,700 | 3,68             | 2,0 | 2,7 | ◆     |               |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbone avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbone sans revêtement

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● |   | ○ |   |
| M | ● | ● | ● |   |
| K | ○ | ○ |   | ● |
| N |   |   |   | ● |
| S | ○ |   |   |   |
| H |   |   |   |   |

● Main application  
Applicazione principale  
Application principale

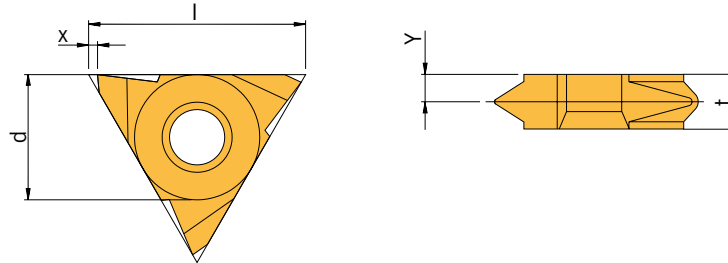
○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Metric-ISO / Metrico-ISO / ISO métrique



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | t   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-----|-------|
|                                    |  |    |       |                  |     |     |     | AL100 |
| 16VEL-V-ISO1,50                    | 1,5  | 16 | 9,525 | 0,92             | 1,1 | 2,6 | 3,6 | ◆     |
| 16VEL-V-ISO2,00                    | 2,0  | 16 | 9,525 | 1,23             | 1,1 | 2,3 | 3,6 | ◆     |
| 16VEL-V-ISO2,50                    | 2,5  | 16 | 9,525 | 1,53             | 1,1 | 2,1 | 3,6 | ◆     |
| 16VEL-V-ISO3,00                    | 3,0  | 16 | 9,525 | 1,84             | 1,1 | 2,0 | 3,6 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y    | t   | HC    | HC    |
|------------------------------------|--|----|-------|------------------|-----|------|-----|-------|-------|
|                                    |  |    |       |                  |     |      |     | AL100 | AM15C |
| 16VER-V-ISO0,75                    | 0,75                                       | 16 | 9,525 | 0,46             | 1,1 | 3,00 | 3,6 | ◆     |       |
| 16VER-V-ISO1,00                    | 1,00                                       | 16 | 9,525 | 0,61             | 1,1 | 2,90 | 3,6 | ◆     |       |
| 16VER-V-ISO1,25                    | 1,25                                       | 16 | 9,525 | 0,77             | 1,1 | 2,70 | 3,6 | ◆     |       |
| 16VER-V-ISO1,50                    | 1,50                                       | 16 | 9,525 | 0,92             | 1,1 | 2,60 | 3,6 | ◆     | ◆     |
| 16VER-V-ISO1,75                    | 1,75                                       | 16 | 9,525 | 1,07             | 1,1 | 2,45 | 3,6 | ◆     | ◆     |
| 16VER-V-ISO2,00                    | 2,00                                       | 16 | 9,525 | 1,23             | 1,1 | 2,30 | 3,6 | ◆     |       |
| 16VER-V-ISO2,50                    | 2,50                                       | 16 | 9,525 | 1,53             | 1,1 | 2,10 | 3,6 | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

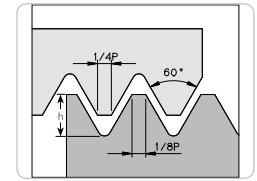
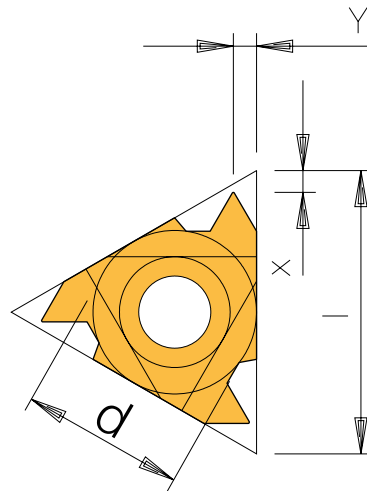
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Metric-ISO / Metrico-ISO / ISO métrique



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   | HU   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C | AK20 |
| 11IL-V-ISO2,00                     | 2,0  | 11 | 6,350 | 1,15             | 0,9 | 1,1 | ◆     |      |      |
| 16IL-V-ISO1,50                     | 1,5  | 16 | 9,525 | 0,87             | 0,8 | 1,0 | ◆     |      | ◆    |
| 16IL-V-ISO1,50-CB                  | 1,5  | 16 | 9,525 | 0,86             | 1,2 | 1,0 | ◆     |      |      |
| 16IL-V-ISO2,00                     | 2,0  | 16 | 9,525 | 1,15             | 1,0 | 1,3 | ◆     | ◆    |      |
| 16IL-V-ISO3,00                     | 3,0  | 16 | 9,525 | 1,73             | 1,1 | 1,5 | ◆     |      |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbone avec revêtement  
HU = Solid carbide uncoated / Metallo duro non rivestito / Carbone sans revêtement

|   | P | M | K | N | S | H |
|---|---|---|---|---|---|---|
| P | ● |   |   |   |   |   |
| M | ● | ● |   |   |   |   |
| K | ○ | ○ | ● |   |   |   |
| N |   |   |   | ● |   |   |
| S | ○ |   |   |   |   |   |
| H |   |   |   |   |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   | HU    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|-------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C | AM15C |
| 11IR-V-ISO0,50                     | 0,50                                       | 11 | 6,350 | 0,29             | 0,6 | 0,4 | ◆     |      | ◆     |
| 11IR-V-ISO0,50-CB                  | 0,50                                       | 11 | 6,350 | 0,29             | 0,8 | 0,4 | ◆     |      |       |
| 11IR-V-ISO0,70-CB                  | 0,70                                       | 11 | 6,350 | 0,35             | 0,8 | 0,6 | ◆     |      |       |
| 11IR-V-ISO0,75                     | 0,75                                       | 11 | 6,350 | 0,43             | 0,6 | 0,6 | ◆     |      |       |
| 11IR-V-ISO0,75-CB                  | 0,75                                       | 11 | 6,350 | 0,43             | 0,8 | 0,6 | ◆     |      |       |
| 11IR-V-ISO0,80-CB                  | 0,80                                       | 11 | 6,350 | 0,46             | 0,8 | 0,6 | ◆     |      |       |
| 11IR-V-ISO1,00                     | 1,00                                       | 11 | 6,350 | 0,58             | 0,6 | 0,7 | ◆     | ◆    | ◆     |
| 11IR-V-ISO1,00-CB                  | 1,00                                       | 11 | 6,350 | 0,58             | 0,8 | 0,7 | ◆     |      |       |
| 11IR-V-ISO1,25                     | 1,25                                       | 11 | 6,350 | 0,72             | 0,8 | 0,9 | ◆     |      |       |
| 11IR-V-ISO1,50                     | 1,50                                       | 11 | 6,350 | 0,87             | 0,8 | 1,0 | ◆     | ◆    | ◆     |
| 11IR-V-ISO1,50-CB                  | 1,50                                       | 11 | 6,350 | 0,86             | 0,8 | 0,8 | ◆     |      |       |
| 11IR-V-ISO1,75                     | 1,75                                       | 11 | 6,350 | 1,01             | 0,9 | 1,1 | ◆     |      |       |
| 11IR-V-ISO2,00                     | 2,00                                       | 11 | 6,350 | 1,15             | 0,9 | 1,1 | ◆     |      |       |

9

Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d      | h <sub>min</sub> | x   | y   | HC    | HC            | HU   |
|------------------------------------|--|----|--------|------------------|-----|-----|-------|---------------|------|
|                                    |  |    |        |                  |     |     | AL100 | AM7C<br>AM15C | AK20 |
| 11IR-V-ISO2,00-CB                  | 2,00                                       | 11 | 6,350  | 1,15             | 0,8 | 1,0 | ◆     |               |      |
| 11IR-V-ISO2,50                     | 2,50                                       | 11 | 6,350  | 1,44             | 0,8 | 1,1 | ◆     |               |      |
| 11IR-V-ISO2,50-CB                  | 2,50                                       | 11 | 6,350  | 1,44             | 0,8 | 1,1 | ◆     |               |      |
| 16IR-V-ISO0,50                     | 0,50                                       | 16 | 9,525  | 0,29             | 0,6 | 0,4 | ◆     |               | ◆    |
| 16IR-V-ISO0,50-CB                  | 0,50                                       | 16 | 9,525  | 0,29             | 0,8 | 0,4 | ◆     |               |      |
| 16IR-V-ISO0,70-CB                  | 0,70                                       | 16 | 9,525  | 0,35             | 1,2 | 0,6 | ◆     |               |      |
| 16IR-V-ISO0,75                     | 0,75                                       | 16 | 9,525  | 0,43             | 0,6 | 0,6 | ◆     |               | ◆    |
| 16IR-V-ISO0,75-CB                  | 0,75                                       | 16 | 9,525  | 0,43             | 1,2 | 0,6 | ◆     |               |      |
| 16IR-V-ISO0,80-CB                  | 0,80                                       | 16 | 9,525  | 0,46             | 1,2 | 1,0 | ◆     |               |      |
| 16IR-V-ISO1,00                     | 1,00                                       | 16 | 9,525  | 0,58             | 0,6 | 0,7 | ◆     | ◆             | ◆    |
| 16IR-V-ISO1,00-CB                  | 1,00                                       | 16 | 9,525  | 0,58             | 1,2 | 0,7 | ◆     |               |      |
| 16IR-V-ISO1,25                     | 1,25                                       | 16 | 9,525  | 0,72             | 0,8 | 0,9 | ◆     |               |      |
| 16IR-V-ISO1,25-CB                  | 1,25                                       | 16 | 9,525  | 0,68             | 1,2 | 1,0 | ◆     |               |      |
| 16IR-V-ISO1,50                     | 1,50                                       | 16 | 9,525  | 0,87             | 0,8 | 1,0 | ◆     | ◆             | ◆    |
| 16IR-V-ISO1,50-CB                  | 1,50                                       | 16 | 9,525  | 0,86             | 1,2 | 1,0 | ◆     |               |      |
| 16IR-V-ISO1,75                     | 1,75                                       | 16 | 9,525  | 1,01             | 0,9 | 1,2 | ◆     |               |      |
| 16IR-V-ISO1,75-CB                  | 1,75                                       | 16 | 9,525  | 0,95             | 1,2 | 1,3 | ◆     |               |      |
| 16IR-V-ISO2,00                     | 2,00                                       | 16 | 9,525  | 1,15             | 1,0 | 1,3 | ◆     | ◆             | ◆    |
| 16IR-V-ISO2,00-CB                  | 2,00                                       | 16 | 9,525  | 1,15             | 1,2 | 1,0 | ◆     |               |      |
| 16IR-V-ISO2,50                     | 2,50                                       | 16 | 9,525  | 1,44             | 1,1 | 1,5 | ◆     |               |      |
| 16IR-V-ISO2,50-CB                  | 2,50                                       | 16 | 9,525  | 1,44             | 1,2 | 1,1 | ◆     |               |      |
| 16IR-V-ISO3,00                     | 3,00                                       | 16 | 9,525  | 1,73             | 1,1 | 1,5 | ◆     | ◆             |      |
| 16IR-V-ISO3,00-CB                  | 3,00                                       | 16 | 9,525  | 1,73             | 1,2 | 1,5 | ◆     |               |      |
| 16IR-V-ISO3,50                     | 3,50                                       | 16 | 9,525  | 2,02             | 1,2 | 1,5 | ◆     |               |      |
| 16IR-V-ISO3,50-CB                  | 3,50                                       | 16 | 9,525  | 1,99             | 1,2 | 1,5 | ◆     |               |      |
| 22IR-V-ISO3,50                     | 3,50                                       | 22 | 12,700 | 2,02             | 1,6 | 2,3 | ◆     |               |      |
| 22IR-V-ISO3,50-CB                  | 3,50                                       | 22 | 12,700 | 1,99             | 1,7 | 2,5 | ◆     |               |      |
| 22IR-V-ISO4,00                     | 4,00                                       | 22 | 12,700 | 2,31             | 1,6 | 2,3 | ◆     |               |      |
| 22IR-V-ISO4,00-CB                  | 4,00                                       | 22 | 12,700 | 2,31             | 1,7 | 2,5 | ◆     |               |      |
| 22IR-V-ISO4,50-CB                  | 4,50                                       | 22 | 12,700 | 2,60             | 1,7 | 2,5 | ◆     |               |      |
| 22IR-V-ISO5,00-CB                  | 5,00                                       | 22 | 12,700 | 2,88             | 1,7 | 2,5 | ◆     |               |      |
| 22IR-V-ISO6,00-CB                  | 6,00                                       | 22 | 12,700 | 3,46             | 1,7 | 2,5 | ◆     |               |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   |   |   |   |   |
|---|---|---|---|---|
| P | ● |   | ○ |   |
| M | ● | ● | ● |   |
| K | ○ | ○ |   | ● |
| N |   |   |   | ● |
| S | ○ |   |   |   |
| H |   |   |   |   |

● Main application  
Applicazione principale  
Application principale

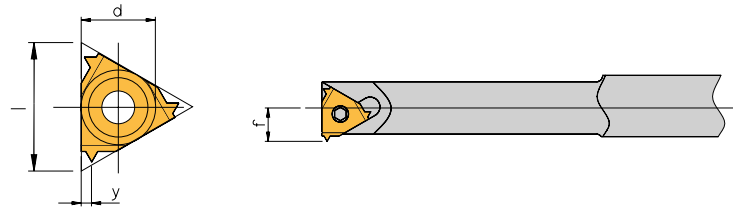
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Metric-ISO / Metrico-ISO / ISO métrique



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|------|-----|------------------|-------|
|                                    |  |    |   |                  |      |     |                  | AM15C |
| 6KIL-V-ISO0,50                     | 0,50                                       | 10 | 6 | 0,29             | 0,60 | 4,4 | 9,3              | ◆     |
| 6KIL-V-ISO0,75                     | 0,75                                       | 10 | 6 | 0,43             | 0,60 | 4,6 | 9,5              | ◆     |
| 6KIL-V-ISO1,00                     | 1,00                                       | 10 | 6 | 0,58             | 0,70 | 4,7 | 9,6              | ◆     |
| 6KIL-V-ISO1,25                     | 1,25                                       | 10 | 6 | 0,72             | 0,90 | 4,9 | 9,8              | ◆     |
| 6KIL-V-ISO1,50                     | 1,50                                       | 10 | 6 | 0,87             | 1,00 | 5,0 | 9,9              | ◆     |
| 6KIL-V-ISO1,75                     | 1,75                                       | 10 | 6 | 1,01             | 1,05 | 5,2 | 10,0             | ◆     |
| 6KIL-V-ISO2,00                     | 2,00                                       | 10 | 6 | 1,15             | 1,05 | 5,3 | 10,0             | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|------|-----|------------------|-------|-------|
|                                    |  |    |   |                  |      |     |                  | AL100 | AM15C |
| 6KIR-V-ISO0,50                     | 0,50                                       | 10 | 6 | 0,29             | 0,60 | 4,4 | 9,3              | ◆     | ◆     |
| 6KIR-V-ISO0,75                     | 0,75                                       | 10 | 6 | 0,43             | 0,60 | 4,6 | 9,5              | ◆     | ◆     |
| 6KIR-V-ISO1,00                     | 1,00                                       | 10 | 6 | 0,58             | 0,70 | 4,7 | 9,6              | ◆     | ◆     |
| 6KIR-V-ISO1,25                     | 1,25                                       | 10 | 6 | 0,72             | 0,90 | 4,9 | 9,8              | ◆     | ◆     |
| 6KIR-V-ISO1,50                     | 1,50                                       | 10 | 6 | 0,87             | 1,00 | 5,0 | 9,9              | ◆     | ◆     |
| 6KIR-V-ISO1,75                     | 1,75                                       | 10 | 6 | 1,01             | 1,05 | 5,2 | 10,0             | ◆     | ◆     |
| 6KIR-V-ISO2,00                     | 2,00                                       | 10 | 6 | 1,15             | 1,05 | 5,3 | 10,0             | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

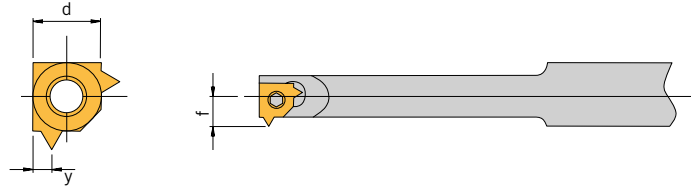
9

## Internal thread / Filettatura interna / Filetage intérieur

Metric-ISO / Metrico-ISO / ISO métrique



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch mm<br>Passo mm<br>Pas en mm | d | h <sub>min</sub> | y    | f    | D <sub>min</sub> | HC    |
|------------------------------------|-----------------------------------|---|------------------|------|------|------------------|-------|
|                                    |                                   |   |                  |      |      |                  | AM15C |
| 5LKIL-V-ISO0,35                    | 0,35                              | 5 | 0,20             | 0,30 | 3,75 | 7,3              | ◆     |
| 5LKIL-V-ISO0,50                    | 0,50                              | 5 | 0,29             | 0,40 | 3,75 | 7,3              | ◆     |
| 5LKIL-V-ISO0,75                    | 0,75                              | 5 | 0,43             | 0,60 | 3,91 | 7,5              | ◆     |
| 5LKIL-V-ISO1,00                    | 1,00                              | 5 | 0,58             | 0,70 | 4,06 | 7,7              | ◆     |
| 5LKIL-V-ISO1,25                    | 1,25                              | 5 | 0,72             | 0,90 | 4,21 | 7,8              | ◆     |
| 5LKIL-V-ISO1,50                    | 1,50                              | 5 | 0,87             | 1,00 | 4,35 | 7,9              | ◆     |
| 5LKIL-V-ISO1,75                    | 1,75                              | 5 | 1,01             | 1,05 | 4,51 | 8,0              | ◆     |
| 5LKIL-V-ISO2,00                    | 2,00                              | 5 | 1,15             | 1,05 | 4,65 | 8,0              | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch mm<br>Passo mm<br>Pas en mm | d | h <sub>min</sub> | y    | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|-----------------------------------|---|------------------|------|------|------------------|-------|-------|
|                                    |                                   |   |                  |      |      |                  | AL100 | AM15C |
| 5LKIR-V-ISO0,35                    | 0,35                              | 5 | 0,20             | 0,30 | 3,75 | 7,3              | ◆     | ◆     |
| 5LKIR-V-ISO0,50                    | 0,50                              | 5 | 0,29             | 0,40 | 3,75 | 7,3              | ◆     | ◆     |
| 5LKIR-V-ISO0,75                    | 0,75                              | 5 | 0,43             | 0,60 | 3,91 | 7,5              | ◆     | ◆     |
| 5LKIR-V-ISO1,00                    | 1,00                              | 5 | 0,58             | 0,70 | 4,06 | 7,7              | ◆     | ◆     |
| 5LKIR-V-ISO1,25                    | 1,25                              | 5 | 0,72             | 0,90 | 4,21 | 7,8              | ◆     | ◆     |
| 5LKIR-V-ISO1,50                    | 1,50                              | 5 | 0,87             | 1,00 | 4,35 | 7,9              | ◆     | ◆     |
| 5LKIR-V-ISO1,75                    | 1,75                              | 5 | 1,01             | 1,05 | 4,51 | 8,0              | ◆     | ◆     |
| 5LKIR-V-ISO2,00                    | 2,00                              | 5 | 1,15             | 1,05 | 4,65 | 8,0              | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

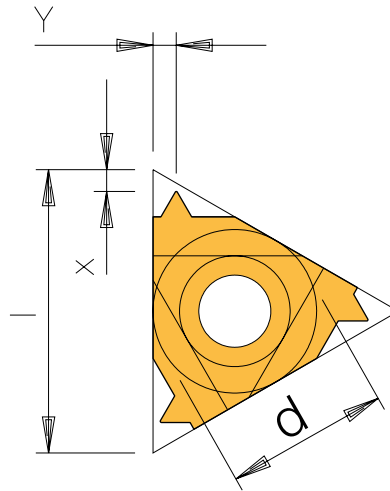
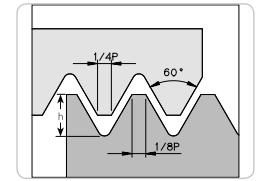
○ Secondary application  
Applicazione secondaria  
Application secondaire



## External thread / Filettatura esterna / Filetage extérieur

American thread - UN / Filettatura norme americane - UN /

Filetage ISO en pouce américain - UN



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C |
| 16ER-V-UN12                        | 12   | 16 | 9,525 | 1,30             | 1,1 | 1,4 | ◆     |      |
| 16ER-V-UN12-CB                     | 12   | 16 | 9,525 | 1,30             | 1,2 | 1,2 | ◆     |      |
| 16ER-V-UN14                        | 14   | 16 | 9,525 | 1,11             | 1,0 | 1,2 | ◆     | ◆    |
| 16ER-V-UN14-CB                     | 14   | 16 | 9,525 | 1,18             | 1,2 | 1,2 | ◆     |      |
| 16ER-V-UN16                        | 16   | 16 | 9,525 | 0,97             | 0,9 | 1,1 | ◆     | ◆    |
| 16ER-V-UN16-CB                     | 16   | 16 | 9,525 | 1,04             | 1,2 | 1,0 | ◆     |      |
| 16ER-V-UN18                        | 18   | 16 | 9,525 | 0,87             | 0,8 | 1,0 | ◆     | ◆    |
| 16ER-V-UN18-CB                     | 18   | 16 | 9,525 | 0,92             | 1,2 | 1,0 | ◆     |      |
| 16ER-V-UN20                        | 20   | 16 | 9,525 | 0,78             | 0,8 | 0,9 | ◆     |      |
| 16ER-V-UN20-CB                     | 20   | 16 | 9,525 | 0,83             | 1,2 | 0,8 | ◆     |      |
| 16ER-V-UN24                        | 24   | 16 | 9,525 | 0,65             | 0,7 | 0,8 | ◆     |      |
| 16ER-V-UN32                        | 32   | 16 | 9,525 | 0,49             | 0,6 | 0,6 | ◆     |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbone avec revêtement

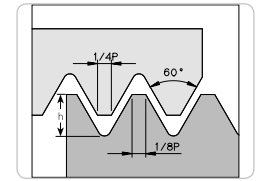
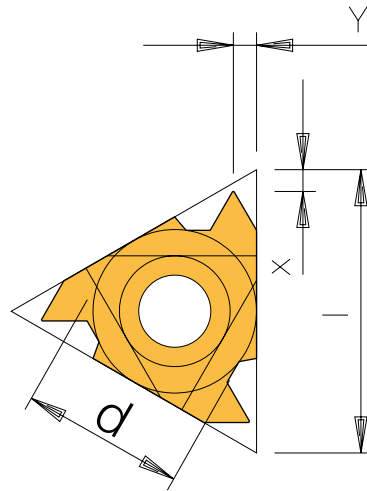
|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● | ● |
| K | ○ | ○ |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

American thread - UN / Filettatura norme americane - UN /  
Filetage ISO en pouce américain - UN



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite

### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|
| 161L-V-UN20                        | 20   | 16 | 9,525 | 0,73             | 0,8 | 0,9 | AL100 |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|
| 111R-V-UN14-CB                     | 14   | 11 | 6,350 | 1,11             | 1,0 | 1,0 | AL100 |
| 161R-V-UN12                        | 12   | 16 | 9,525 | 1,22             | 1,1 | 1,4 | AL100 |
| 161R-V-UN12-CB                     | 12   | 16 | 9,525 | 1,17             | 1,2 | 1,0 | AL100 |
| 161R-V-UN14-CB                     | 14   | 16 | 9,525 | 1,11             | 1,2 | 1,0 | AL100 |
| 161R-V-UN16-CB                     | 16   | 16 | 9,525 | 0,97             | 1,2 | 1,0 | AL100 |
| 161R-V-UN18-CB                     | 18   | 16 | 9,525 | 0,87             | 1,2 | 1,0 | AL100 |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H | ○ |

● Main application  
Applicazione principale  
Application principale

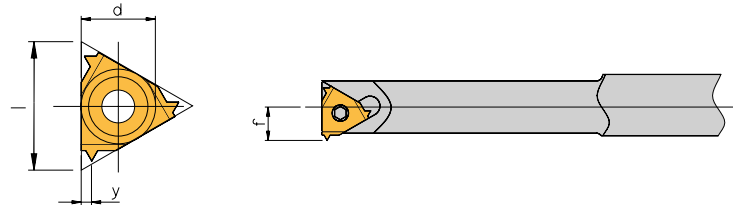
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

American thread - UN / Filettatura norme americane - UN /  
Filetage ISO en pouce américain - UN



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch mm<br>Passo mm<br>Pas en mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC<br>AM15C |
|------------------------------------|-----------------------------------|----|---|------------------|------|-----|------------------|-------------|
| 6KIL-V-UN13                        | 13                                | 10 | 6 | 1,13             | 1,10 | 5,3 | 10,0             | ◆           |
| 6KIL-V-UN14                        | 14                                | 10 | 6 | 1,05             | 1,05 | 5,2 | 10,0             | ◆           |
| 6KIL-V-UN16                        | 16                                | 10 | 6 | 0,92             | 1,05 | 5,1 | 10,0             | ◆           |
| 6KIL-V-UN18                        | 18                                | 10 | 6 | 0,81             | 1,00 | 5,0 | 9,9              | ◆           |
| 6KIL-V-UN20                        | 20                                | 10 | 6 | 0,73             | 0,90 | 4,9 | 9,8              | ◆           |
| 6KIL-V-UN24                        | 24                                | 10 | 6 | 0,61             | 0,75 | 4,8 | 9,7              | ◆           |
| 6KIL-V-UN28                        | 28                                | 10 | 6 | 0,52             | 0,65 | 4,7 | 9,6              | ◆           |
| 6KIL-V-UN32                        | 32                                | 10 | 6 | 0,46             | 0,60 | 4,6 | 9,5              | ◆           |
| 6KIL-V-UN40                        | 40                                | 10 | 6 | 0,37             | 0,60 | 4,5 | 9,5              | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch mm<br>Passo mm<br>Pas en mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|-----------------------------------|----|---|------------------|------|-----|------------------|-------|-------|
|                                    |                                   |    |   |                  |      |     |                  | AL100 | AM15C |
| 6KIR-V-UN13                        | 13                                | 10 | 6 | 1,10             | 1,13 | 5,3 | 10,0             | ◆     | ◆     |
| 6KIR-V-UN14                        | 14                                | 10 | 6 | 1,05             | 1,05 | 5,2 | 10,0             | ◆     | ◆     |
| 6KIR-V-UN16                        | 16                                | 10 | 6 | 0,92             | 1,05 | 5,1 | 10,0             | ◆     | ◆     |
| 6KIR-V-UN18                        | 18                                | 10 | 6 | 0,81             | 1,00 | 5,0 | 9,9              | ◆     | ◆     |
| 6KIR-V-UN20                        | 20                                | 10 | 6 | 0,73             | 0,90 | 4,9 | 9,8              | ◆     | ◆     |
| 6KIR-V-UN24                        | 24                                | 10 | 6 | 0,61             | 0,75 | 4,8 | 9,7              | ◆     | ◆     |
| 6KIR-V-UN28                        | 28                                | 10 | 6 | 0,52             | 0,65 | 4,7 | 9,6              | ◆     | ◆     |
| 6KIR-V-UN32                        | 32                                | 10 | 6 | 0,46             | 0,60 | 4,6 | 9,5              | ◆     | ◆     |
| 6KIR-V-UN40                        | 40                                | 10 | 6 | 0,37             | 0,60 | 4,5 | 9,5              | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

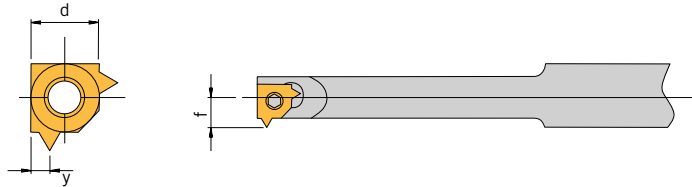
9

## Internal thread / Filettatura interna / Filetage intérieur

American thread - UN / Filettatura norme americane - UN /  
Filetage ISO en pouce américain - UN



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | d | h <sub>min</sub> | y    | f    | D <sub>min</sub> | HC<br>AM15C |
|------------------------------------|---|---|------------------|------|------|------------------|-------------|
| 5LKIL-V-UN14                       | 14                                      | 5 | 1,05             | 1,05 | 4,54 | 8,0              | ◆           |
| 5LKIL-V-UN16                       | 16                                      | 5 | 0,92             | 1,05 | 4,41 | 8,0              | ◆           |
| 5LKIL-V-UN18                       | 18                                      | 5 | 0,81             | 1,00 | 4,30 | 7,9              | ◆           |
| 5LKIL-V-UN20                       | 20                                      | 5 | 0,73             | 0,90 | 4,21 | 7,8              | ◆           |
| 5LKIL-V-UN24                       | 24                                      | 5 | 0,61             | 0,75 | 4,09 | 7,7              | ◆           |
| 5LKIL-V-UN40                       | 40                                      | 5 | 0,37             | 0,60 | 3,80 | 7,6              | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | d | h <sub>min</sub> | y    | f    | D <sub>min</sub> | HC<br>AL100 | HC<br>AM15C |
|------------------------------------|---|---|------------------|------|------|------------------|-------------|-------------|
| 5LKIR-V-UN14                       | 14                                      | 5 | 1,05             | 1,05 | 4,54 | 8,0              | ◆           | ◆           |
| 5LKIR-V-UN16                       | 16                                      | 5 | 0,92             | 1,05 | 4,41 | 8,0              | ◆           | ◆           |
| 5LKIR-V-UN18                       | 18                                      | 5 | 0,81             | 1,00 | 4,30 | 7,9              | ◆           | ◆           |
| 5LKIR-V-UN20                       | 20                                      | 5 | 0,73             | 0,90 | 4,21 | 7,8              | ◆           | ◆           |
| 5LKIR-V-UN24                       | 24                                      | 5 | 0,61             | 0,75 | 4,09 | 7,7              | ◆           | ◆           |
| 5LKIR-V-UN28                       | 28                                      | 5 | 0,52             | 0,65 | 3,99 | 7,6              | ◆           | ◆           |
| 5LKIR-V-UN32                       | 32                                      | 5 | 0,46             | 0,60 | 3,92 | 7,5              | ◆           | ◆           |
| 5LKIR-V-UN40                       | 40                                      | 5 | 0,37             | 0,60 | 3,80 | 7,6              | ◆           | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

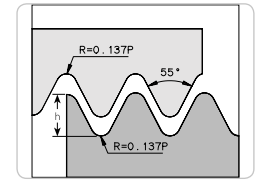
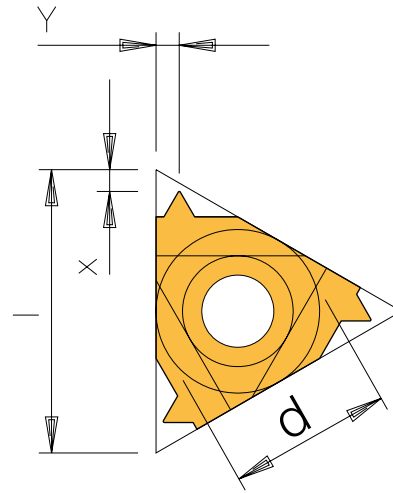
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Whitworth pipe thread - BSW, BSP / Filettatura Whitworth - BSW, BSP /  
Filetage tubulaire Whitworth - BSW, BSP



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC            | HU   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|---------------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C<br>AM15C | AK20 |
| 16ER-V-W11                         | 11   | 16 | 9,525 | 1,48             | 1,1 | 1,5 | ◆     | ◆             |      |
| 16ER-V-W11-CB                      | 11   | 16 | 9,525 | 1,48             | 1,2 | 1,2 | ◆     |               |      |
| 16ER-V-W12-CB                      | 12   | 16 | 9,525 | 1,40             | 1,2 | 1,2 | ◆     |               |      |
| 16ER-V-W14                         | 14   | 16 | 9,525 | 1,16             | 1,0 | 1,2 | ◆     | ◆             | ◆    |
| 16ER-V-W14-CB                      | 14   | 16 | 9,525 | 1,15             | 1,2 | 1,2 | ◆     |               |      |
| 16ER-V-W16-CB                      | 16   | 16 | 9,525 | 1,08             | 1,2 | 1,2 | ◆     |               |      |
| 16ER-V-W19                         | 19   | 16 | 9,525 | 0,86             | 0,8 | 1,0 | ◆     | ◆             | ◆    |
| 16ER-V-W19-CB                      | 19   | 16 | 9,525 | 0,85             | 1,2 | 1,0 | ◆     |               |      |
| 16ER-V-W24                         | 24   | 16 | 9,525 | 0,68             | 0,7 | 0,8 |       |               | ◆    |
| 16ER-V-W28                         | 28   | 16 | 9,525 | 0,58             | 0,6 | 0,7 | ◆     | ◆             |      |
| 16ER-V-W28-CB                      | 28   | 16 | 9,525 | 0,63             | 1,2 | 0,8 | ◆     |               |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

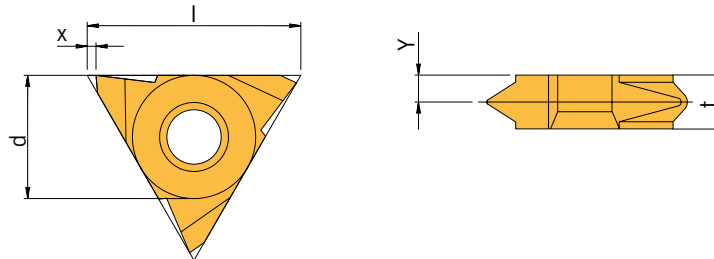
|   |   |   |   |   |
|---|---|---|---|---|
| P | ● |   | ○ |   |
| M | ● | ● | ● |   |
| K | ○ | ○ |   | ● |
| N |   |   |   | ● |
| S | ○ |   |   |   |
| H |   |   |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Whitworth pipe thread - BSW, BSP / Filettatura Whitworth - BSW, BSP / Filetage tubulaire Whitworth - BSW, BSP



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | t   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-----|-------|
|                                    |  |    |       |                  |     |     |     | AL100 |
| 16VER-V-W11                        | 11   | 16 | 9,525 | 1,48             | 1,1 | 2,1 | 3,6 | ◆     |
| 16VER-V-W14                        | 14   | 16 | 9,525 | 1,16             | 1,1 | 2,4 | 3,6 | ◆     |
| 16VER-V-W19                        | 19   | 16 | 9,525 | 0,68             | 1,1 | 2,7 | 3,6 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

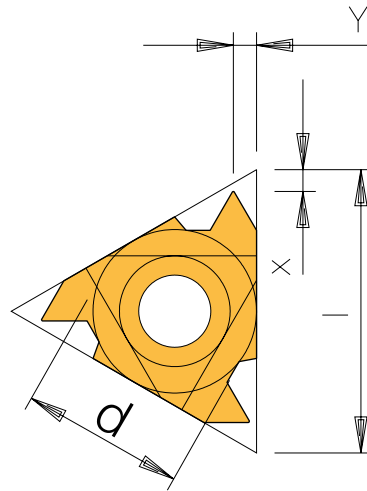
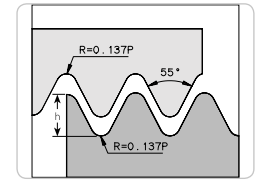
|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Whitworth pipe thread - BSW, BSP / Filettatura Whitworth - BSW, BSP / Filetage tubulaire Whitworth - BSW, BSP



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC            | HU   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|---------------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C<br>AM15C | AK20 |
| 11IR-V-W14                         | 14   | 11 | 6,350 | 1,16             | 0,9 | 1,1 | ◆     | ◆             |      |
| 11IR-V-W14-CB                      | 14   | 11 | 6,350 | 1,15             | 1,2 | 1,1 | ◆     |               |      |
| 11IR-V-W19                         | 19   | 11 | 6,350 | 0,86             | 0,8 | 1,0 | ◆     | ◆             |      |
| 11IR-V-W19-CB                      | 19   | 11 | 6,350 | 0,85             | 1,2 | 1,0 | ◆     |               |      |
| 16IR-V-UN18-CB                     | 18   | 16 | 9,525 | 1,48             | 1,2 | 1,5 | ◆     |               |      |
| 16IR-V-W11                         | 11   | 16 | 9,525 | 1,48             | 1,1 | 1,5 | ◆     | ◆             | ◆    |
| 16IR-V-W12-CB                      | 12   | 16 | 9,525 | 1,48             | 1,2 | 1,1 | ◆     |               |      |
| 16IR-V-W14                         | 14   | 16 | 9,525 | 1,16             | 1,0 | 1,2 | ◆     | ◆             | ◆    |
| 16IR-V-W14-CB                      | 14   | 16 | 9,525 | 1,15             | 1,2 | 1,2 | ◆     |               |      |
| 16IR-V-W16-CB                      | 16   | 16 | 9,525 | 1,15             | 1,2 | 1,1 | ◆     |               |      |
| 16IR-V-W19-CB                      | 19   | 16 | 9,525 | 0,85             | 1,2 | 1,0 | ◆     |               |      |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

HU = Solid carbide uncoated / Metallo duro non rivestito / Carbure sans revêtement

|   | P | M | K | N | S | H |
|---|---|---|---|---|---|---|
| P | ● |   |   | ○ |   |   |
| M | ● | ● | ● |   |   |   |
| K | ○ | ○ |   |   |   | ● |
| N |   |   |   |   |   | ● |
| S | ○ |   |   |   |   |   |
| H |   |   |   |   |   |   |

● Main application  
Applicazione principale  
Application principale

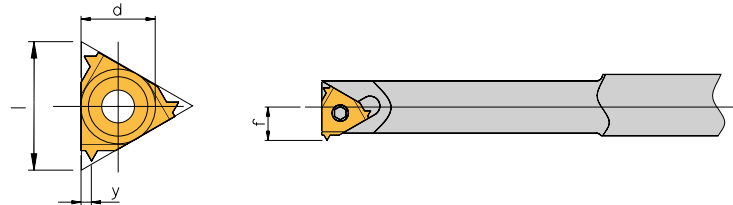
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Whitworth pipe thread - BSW, BSP / Filettatura Whitworth - BSW, BSP / Filetage tubulaire Whitworth - BSW, BSP



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|-------|
|                                    |  |    |   |                  |     |     | AM15C |
| 6KIL-V-W14                         | 14   | 10 | 6 | 1,16             | 1,1 | 5,3 | ◆     |
| 6KIL-V-W19                         | 19   | 10 | 6 | 0,86             | 1,0 | 5,0 | ◆     |
| 6KIL-V-W28                         | 28   | 10 | 6 | 0,58             | 0,7 | 4,7 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|-------|-------|
|                                    |  |    |   |                  |     |     | AL100 | AM15C |
| 6KIR-V-W14                         | 14   | 10 | 6 | 1,16             | 1,1 | 5,3 | ◆     | ◆     |
| 6KIR-V-W19                         | 19   | 10 | 6 | 0,86             | 1,0 | 5,0 | ◆     | ◆     |
| 6KIR-V-W28                         | 28   | 10 | 6 | 0,58             | 0,7 | 4,7 | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

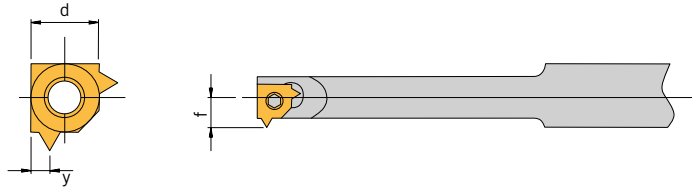


## Internal thread / Filettatura interna / Filetage intérieur

Whitworth pipe thread - BSW, BSP / Filettatura Whitworth - BSW, BSP / Filetage tubulaire Whitworth - BSW, BSP



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | HC    |
|------------------------------------|--|---|------------------|-----|------|-------|
|                                    |  |   |                  |     |      | AM15C |
| 5LKIL-V-W14                        | 14   | 5 | 1,16             | 1,1 | 4,68 | ◆     |
| 5LKIL-V-W19                        | 19   | 5 | 0,86             | 1,0 | 4,35 | ◆     |
| 5LKIL-V-W28                        | 28   | 5 | 0,58             | 0,7 | 4,05 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | HC    | HC    |
|------------------------------------|--|---|------------------|-----|------|-------|-------|
|                                    |  |   |                  |     |      | AL100 | AM15C |
| 5LKIR-V-W14                        | 14   | 5 | 1,16             | 1,1 | 4,68 | ◆     | ◆     |
| 5LKIR-V-W19                        | 19   | 5 | 0,86             | 1,0 | 4,35 | ◆     | ◆     |
| 5LKIR-V-W28                        | 28   | 5 | 0,58             | 0,7 | 4,05 | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

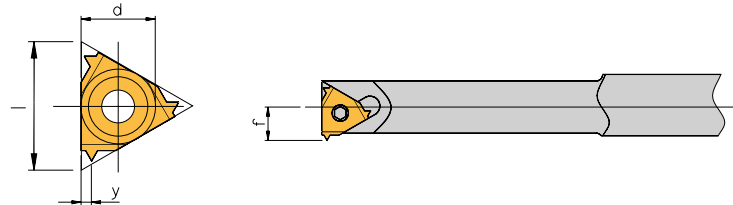
9

## Internal thread / Filettatura interna / Filetage intérieur

Conical pipe thread - BSPT / Filettatura tubi conica - BSPT / Filetage tubulaire conique - BSPT



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|---|----|---|------------------|-----|-----|------------------|-------|
| 6KIL-V-BSPT14                      | 14                                      | 10 | 6 | 1,16             | 1,2 | 5,3 | 10,0             | AM15C |
| 6KIL-V-BSPT19                      | 19                                      | 10 | 6 | 0,86             | 0,9 | 5,0 | 9,9              | AM15C |
| 6KIL-V-BSPT28                      | 28                                      | 10 | 6 | 0,58             | 0,6 | 4,7 | 9,6              | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|---|----|---|------------------|-----|-----|------------------|-------|-------|
| 6KIR-V-BSPT14                      | 14                                      | 10 | 6 | 1,16             | 1,2 | 5,3 | 10,0             | AL100 | AM15C |
| 6KIR-V-BSPT19                      | 19                                      | 10 | 6 | 0,86             | 0,9 | 5,0 | 9,9              | AL100 | AM15C |
| 6KIR-V-BSPT28                      | 28                                      | 10 | 6 | 0,58             | 0,6 | 4,7 | 9,6              | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

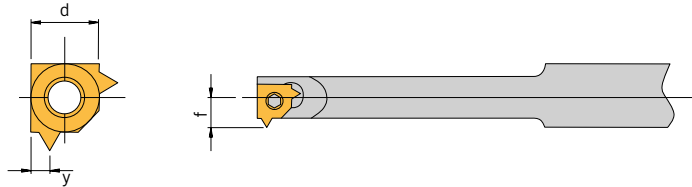
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Conical pipe thread - BSPT / Filettatura tubi conica - BSPT / Filetage tubulaire conique - BSPT



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AM15C |
|------------------------------------|---|---|-----------|-----|------|-----------|-------------|
| 5LKIL-V-BSPT14                     | 14                                      | 5 | 1,16      | 1,2 | 4,68 | 8,0       | ◆           |
| 5LKIL-V-BSPT19                     | 19                                      | 5 | 0,86      | 0,9 | 4,35 | 7,9       | ◆           |
| 5LKIL-V-BSPT28                     | 28                                      | 5 | 0,58      | 0,6 | 4,05 | 7,6       | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch Inch<br>Passo Inch<br>Pas en Inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AL100 | HC<br>AM15C |
|------------------------------------|---|---|-----------|-----|------|-----------|-------------|-------------|
| 5LKIR-V-BSPT14                     | 14                                      | 5 | 1,16      | 1,2 | 4,68 | 8,0       | ◆           | ◆           |
| 5LKIR-V-BSPT19                     | 19                                      | 5 | 0,86      | 0,9 | 4,35 | 7,9       | ◆           | ◆           |
| 5LKIR-V-BSPT28                     | 28                                      | 5 | 0,58      | 0,6 | 4,05 | 7,6       | ◆           | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

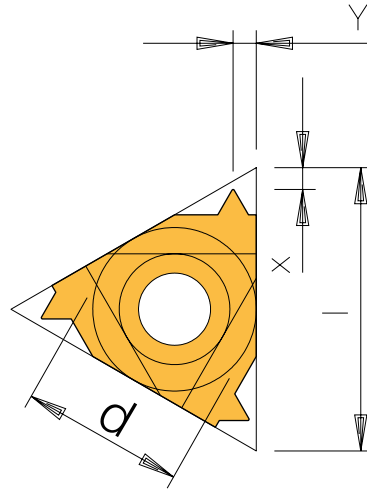
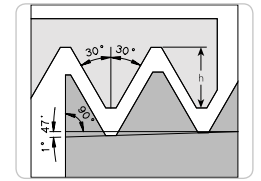
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

9

## External thread / Filettatura esterna / Filetage extérieur

Tapered pipe thread - NPT / Filettatura tubi conica - NPT /  
Filetage tubulaire conique - NPT



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C |
| 16ER-V-NPT11,5                     | 11,5   | 16 | 9,525 | 1,64             | 1,1 | 1,5 | ◆     | ◆    |
| 16ER-V-NPT11,50-CB                 | 11,5   | 16 | 9,525 | 1,71             | 1,2 | 1,2 | ◆     | ◆    |
| 16ER-V-NPT14                       | 14,0   | 16 | 9,525 | 1,33             | 0,9 | 1,2 | ◆     | ◆    |
| 16ER-V-NPT14-CB                    | 14,0   | 16 | 9,525 | 1,40             | 1,2 | 1,2 | ◆     | ◆    |
| 16ER-V-NPT18                       | 18,0   | 16 | 9,525 | 1,01             | 0,8 | 1,0 | ◆     | ◆    |
| 16ER-V-NPT18-CB                    | 18,0   | 16 | 9,525 | 1,08             | 1,2 | 0,8 | ◆     | ◆    |
| 16ER-V-NPT27-CB                    | 27,0   | 16 | 9,525 | 0,73             | 1,2 | 0,8 | ◆     | ◆    |

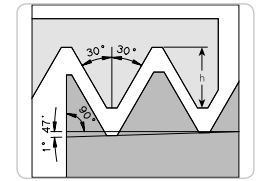
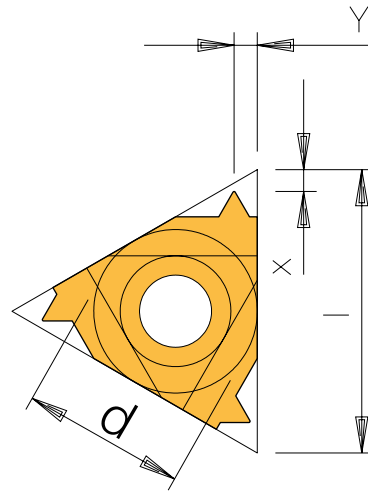
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● | ● |
| K | ○ | ○ |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Tapered pipe thread - NPT / Filettatura tubi conica - NPT /  
Filetage tubulaire conique - NPT



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x    | y   | HC    |
|------------------------------------|--|----|-------|------------------|------|-----|-------|
|                                    |  |    |       |                  |      |     | AL100 |
| 11IR-V-NPT14                       | 14,0   | 11 | 6,350 | 1,33             | 0,80 | 1,0 | ◆     |
| 11IR-V-NPT18                       | 18,0   | 11 | 6,350 | 1,01             | 0,80 | 1,0 | ◆     |
| 16IR-V-NPT8-CB                     | 8,0  | 16 | 9,525 | 2,49             | 1,35 | 1,2 | ◆     |
| 16IR-V-NPT11,50-CB                 | 11,5   | 16 | 9,525 | 1,71             | 1,20 | 1,2 | ◆     |
| 16IR-V-NPT14-CB                    | 14,0   | 16 | 9,525 | 1,40             | 1,20 | 0,8 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale

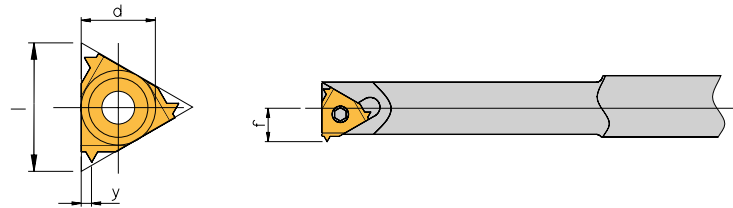
○ Secondary application  
Applicazione secondaria  
Application secondaire

Internal thread / Filettatura interna / Filetage intérieur

Tapered pipe thread - NPT / Tapered fine Pitch pipe thread - NPTF / Filettatura tubi conica - NPT / Filettatura tubi conica Passo fine - NPTF / Filetage tubulaire conique - NPT / Filetage tubulaire conique fin - NPTF



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|
|                                    |  |    |   |                  |     |     |                  | AM15C |
| 6KIL-V-NPT14                       | 14   | 10 | 6 | 1,33             | 1,1 | 5,3 | 10               | ◆     |
| 6KIL-V-NPT18                       | 18   | 10 | 6 | 1,01             | 1,0 | 5,3 | 10               | ◆     |
| 6KIL-V-NPT27                       | 27   | 10 | 6 | 0,66             | 0,8 | 5,3 | 10               | ◆     |
| 6KIL-V-NPTF14                      | 14   | 10 | 6 | 1,35             | 1,1 | 5,3 | 10               | ◆     |
| 6KIL-V-NPTF18                      | 18   | 10 | 6 | 1,00             | 1,0 | 5,3 | 10               | ◆     |
| 6KIL-V-NPTF27                      | 27   | 10 | 6 | 0,64             | 0,8 | 5,3 | 10               | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|-------|
|                                    |  |    |   |                  |     |     |                  | AL100 | AM15C |
| 6KIR-V-NPT14                       | 14   | 10 | 6 | 1,33             | 1,1 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-NPT18                       | 18   | 10 | 6 | 1,01             | 1,0 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-NPT27                       | 27   | 10 | 6 | 0,66             | 0,8 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-NPTF14                      | 14   | 10 | 6 | 1,35             | 1,1 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-NPTF18                      | 18   | 10 | 6 | 1,00             | 1,0 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-NPTF27                      | 27   | 10 | 6 | 0,64             | 0,8 | 5,3 | 10               | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

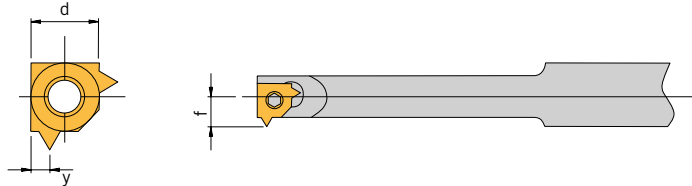


## Internal thread / Filettatura interna / Filetage intérieur

Tapered pipe thread - NPT / Tapered fine Pitch pipe thread - NPTF /  
Filettatura tubi conica - NPT / Filettatura tubi conica Passo fine - NPTF /  
Filetage tubulaire conique - NPT / Filetage tubulaire conique fin - NPTF



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|
| 5LKIL-V-NPT14                      | 14   | 5 | 1,33             | 1,1 | 4,65 | 8                | AM15C |
| 5LKIL-V-NPT18                      | 18   | 5 | 1,01             | 1,0 | 4,65 | 8                | ◆     |
| 5LKIL-V-NPT27                      | 27   | 5 | 0,66             | 0,8 | 4,65 | 8                | ◆     |
| 5LKIL-V-NPTF14                     | 14   | 5 | 1,35             | 1,1 | 4,65 | 8                | ◆     |
| 5LKIL-V-NPTF18                     | 18   | 5 | 1,00             | 1,0 | 4,65 | 8                | ◆     |
| 5LKIL-V-NPTF27                     | 27   | 5 | 0,64             | 0,8 | 4,65 | 8                | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|-------|
| 5LKIR-V-NPT14                      | 14   | 5 | 1,33             | 1,1 | 4,65 | 8                | AL100 | AM15C |
| 5LKIR-V-NPT18                      | 18   | 5 | 1,01             | 1,0 | 4,65 | 8                | ◆     | ◆     |
| 5LKIR-V-NPT27                      | 27   | 5 | 0,66             | 0,8 | 4,65 | 8                | ◆     | ◆     |
| 5LKIR-V-NPTF14                     | 14   | 5 | 1,35             | 1,1 | 4,65 | 8                | ◆     | ◆     |
| 5LKIR-V-NPTF18                     | 18   | 5 | 1,00             | 1,0 | 4,65 | 8                | ◆     | ◆     |
| 5LKIR-V-NPTF27                     | 27   | 5 | 0,64             | 0,8 | 4,65 | 8                | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

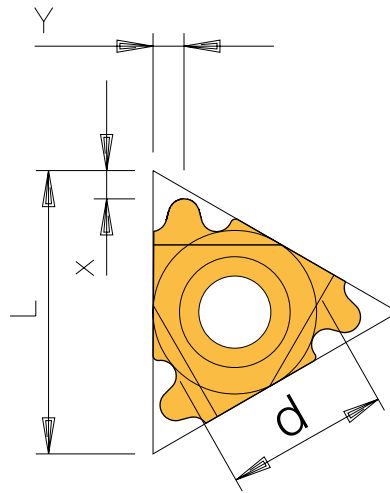
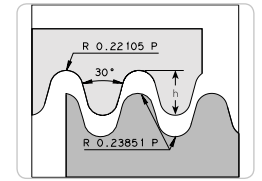
|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Round thread - DIN 405 / Filettatura tonda - DIN 405 / Filetage rond - DIN 405



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    | HC   |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|------|
|                                    |  |    |       |                  |     |     | AL100 | AM7C |
| 16ER-V-RD405/6                     | 6  | 16 | 9,525 | 2,12             | 1,5 | 1,7 | ◆     | ◆    |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

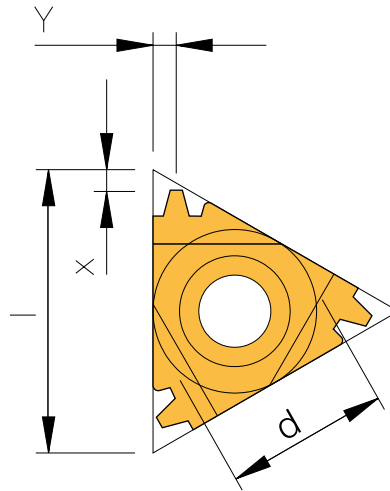
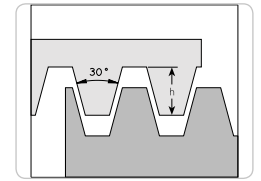
|   |   |   |
|---|---|---|
| P | ● |   |
| M | ● | ● |
| K | ○ | ○ |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



## External thread / Filettatura esterna / Filetage extérieur

Trapezoidal thread - DIN 103 / Filettatura trapezoidale - DIN 103 /  
Filetage trapézoïdal - DIN 103



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d      | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|--------|------------------|-----|-----|-------|
|                                    |  |    |        |                  |     |     | AL100 |
| 16ER-V-TR103/2,0                   | 2  | 16 | 9,525  | 1,25             | 1,1 | 1,3 | ◆     |
| 16ER-V-TR103/3,0                   | 3  | 16 | 9,525  | 1,75             | 1,3 | 1,5 | ◆     |
| 22ER-V-TR103/4,0                   | 4  | 22 | 12,700 | 2,25             | 1,7 | 1,9 | ◆     |
| 22ER-V-TR103/5,0                   | 5  | 22 | 12,700 | 2,75             | 2,1 | 2,5 | ◆     |

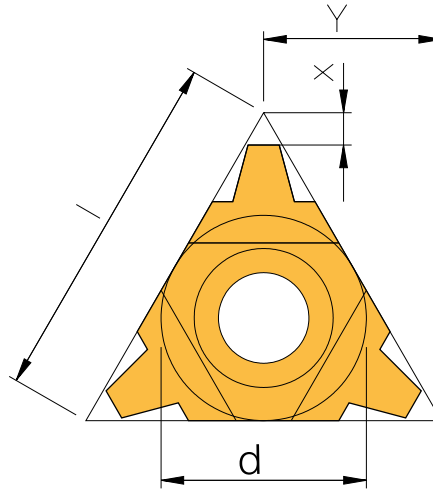
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## External thread / Filettatura esterna / Filetage extérieur

Trapezoidal thread - DIN 103 / Filettatura trapezoidale - DIN 103 /  
Filetage trapézoïdal - DIN 103



### Neutral design / Versione neutral / Modèle neutre

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y    | HC    |
|------------------------------------|--|----|-------|------------------|-----|------|-------|
| 27UEN-V-TR103/8,0                  | 8  | 27 | 15,88 | 4,5              | 2,6 | 13,7 | AL100 |

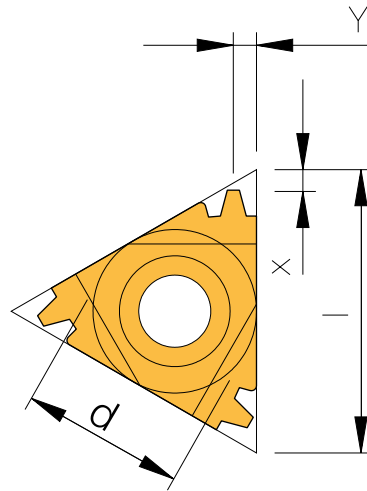
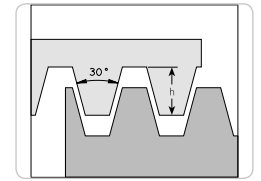
HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N |   |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

**Trapezoidal thread - DIN 103 / Filettatura trapezoidale - DIN 103 /**  
Filetage trapézoïdal - DIN 103



Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d     | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|
| 16IR-V-TR103/3,0                   | 3  | 16 | 9,525 | 1,75             | 1,3 | 1,5 | AL100 |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

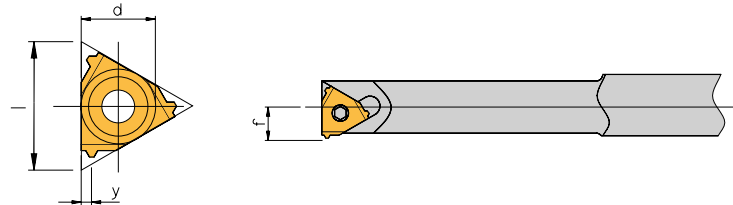
## Internal thread / Filettatura interna / Filetage intérieur

Trapezoidal thread - DIN 103 / Filettatura trapezoidale - DIN 103 /

Filetage trapézoïdal - DIN 103



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|------|-----|------------------|-------|
|                                    |  |    |   |                  |      |     |                  | AM15C |
| 6KIL-V-TR103/1,5                   | 1,5  | 10 | 6 | 0,85             | 0,85 | 5,3 | 10               | ◆     |
| 6KIL-V-TR103/2,0                   | 2,0  | 10 | 6 | 1,25             | 1,30 | 5,3 | 10               | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | l  | d | h <sub>min</sub> | y    | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|------|-----|------------------|-------|-------|
|                                    |  |    |   |                  |      |     |                  | AL100 | AM15C |
| 6KIR-V-TR103/1,5                   | 1,5  | 10 | 6 | 0,85             | 0,85 | 5,3 | 10               | ◆     | ◆     |
| 6KIR-V-TR103/2,0                   | 2,0  | 10 | 6 | 1,25             | 1,30 | 5,3 | 10               |       | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

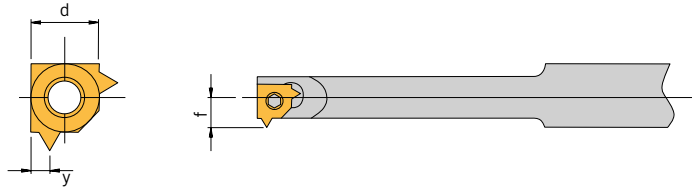
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Trapezoidal thread - DIN 103 / Filettatura trapezoidale - DIN 103 /  
Filetage trapézoïdal - DIN 103



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | d | $h_{min}$ | y    | f    | $D_{min}$ | HC<br>AM15C |
|------------------------------------|--|---|-----------|------|------|-----------|-------------|
| 5LKIL-V-TR103/1,5                  | 1,5  | 5 | 0,85      | 0,85 | 4,65 | 8         | ◆           |
| 5LKIL-V-TR103/2,0                  | 2,0  | 5 | 1,25      | 1,30 | 4,65 | 8         | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | d | $h_{min}$ | y    | f    | $D_{min}$ | HC<br>AL100 | HC<br>AM15C |
|------------------------------------|--|---|-----------|------|------|-----------|-------------|-------------|
| 5LKIR-V-TR103/1,5                  | 1,5  | 5 | 0,85      | 0,85 | 4,65 | 8         | ◆           | ◆           |
| 5LKIR-V-TR103/2,0                  | 2,0  | 5 | 1,25      | 1,30 | 4,65 | 8         | ◆           | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

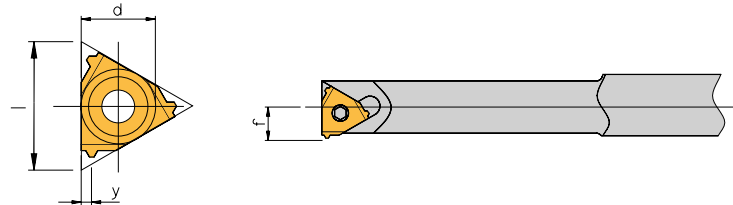
9

## Internal thread / Filettatura interna / Filetage intérieur

American trapezoidal thread - ACME / Filettatura trapezoidale - ACME /  
Filetage trapézoïdal américain - ACME



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|
| 6KIL-V-ACME12                      | 12   | 10 | 6 | 1,19             | 1,1 | 5,1 | 10               | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|-------|
| 6KIR-V-ACME12                      | 12   | 10 | 6 | 1,19             | 1,1 | 5,1 | 10               | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

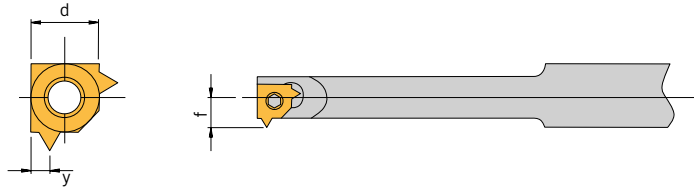


## Internal thread / Filettatura interna / Filetage intérieur

American trapezoidal thread - ACME / Filettatura trapezoidale - ACME /  
Filetage trapézoïdal américain - ACME



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AM15C |
|------------------------------------|--|---|-----------|-----|------|-----------|-------------|
| 5LKIL-V-ACME12                     | 12   | 5 | 1,19      | 1,1 | 4,42 | 8         | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AL100 | HC<br>AM15C |
|------------------------------------|--|---|-----------|-----|------|-----------|-------------|-------------|
| 5LKIR-V-ACME12                     | 12   | 5 | 1,19      | 1,1 | 4,42 | 8         | ◆           | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

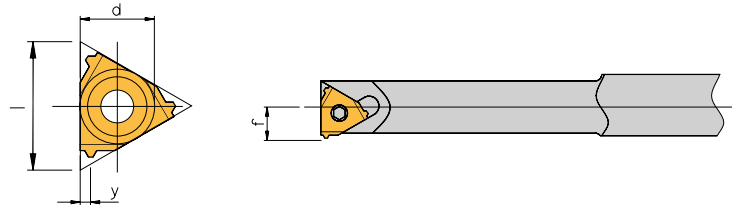
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

**American flat trapezoidal thread - Stub ACME / Filettatura a norma americana**  
Trapezoidale piana - Stub ACME / Filetage trapézoïdal américain aplati - Stub ACME



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|
|                                    |  |    |   |                  |     |     |                  | AM15C |
| 6KIL-V-STACME12                    | 12   | 10 | 6 | 0,76             | 1,2 | 5,1 | 10               | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|-------|
|                                    |  |    |   |                  |     |     |                  | AL100 | AM15C |
| 6KIR-V-STACME12                    | 12   | 10 | 6 | 0,76             | 1,2 | 5,1 | 10               | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire



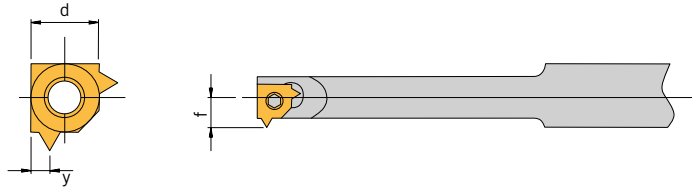


## Internal thread / Filettatura interna / Filetage intérieur

**American flat trapezoidal thread - Stub ACME / Filettatura a norma americana**  
Trapezoidale piana - Stub ACME / Filetage trapézoïdal américain aplati - Stub ACME



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AM15C |
|------------------------------------|--|---|-----------|-----|------|-----------|-------------|
| 5LKIL-V-STACME12                   | 12   | 5 | 0,76      | 1,2 | 4,42 | 8         | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | $h_{min}$ | y   | f    | $D_{min}$ | HC<br>AL100 | HC<br>AM15C |
|------------------------------------|--|---|-----------|-----|------|-----------|-------------|-------------|
| 5LKIR-V-STACME12                   | 12   | 5 | 0,76      | 1,2 | 4,42 | 8         | ◆           | ◆           |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

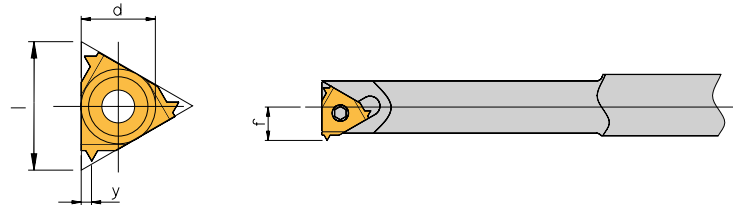
9

## Internal thread / Filettatura interna / Filetage intérieur

Aerospace thread - UNJ / Filettatura aeronautica - UNJ /  
Filetage aéronautique - UNJ



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|
| 6KIL-V-UNJ20                       | 20   | 10 | 6 | 0,66             | 0,9 | 4,9 | 9,8              | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|-------|
| 6KIR-V-UNJ20                       | 20   | 10 | 6 | 0,66             | 0,9 | 4,9 | 9,8              | AL100 | AM15C |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

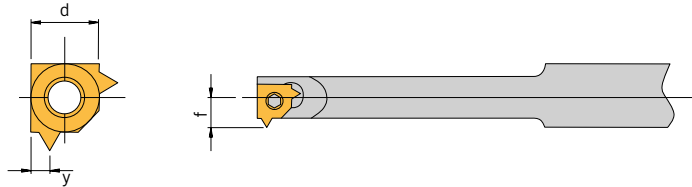


## Internal thread / Filettatura interna / Filetage intérieur

Aerospace thread - UNJ / Filettatura aeronautica - UNJ /  
Filetage aéronautique - UNJ



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|
|                                    |  |   |                  |     |      |                  | AM15C |
| 5LKIL-V-UNJ14                      | 14   | 5 | 0,95             | 1,0 | 4,54 | 8,0              | ◆     |
| 5LKIL-V-UNJ16                      | 16   | 5 | 0,83             | 1,0 | 4,41 | 7,8              | ◆     |
| 5LKIL-V-UNJ18                      | 18   | 5 | 0,74             | 1,0 | 4,30 | 7,9              | ◆     |
| 5LKIL-V-UNJ20                      | 20   | 5 | 0,66             | 0,9 | 4,21 | 7,8              | ◆     |
| 5LKIL-V-UNJ24                      | 24   | 5 | 0,55             | 0,8 | 4,20 | 7,6              | ◆     |
| 5LKIL-V-UNJ28                      | 28   | 5 | 0,47             | 0,6 | 3,99 | 7,6              | ◆     |
| 5LKIL-V-UNJ32                      | 32   | 5 | 0,42             | 0,6 | 3,92 | 7,5              | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
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| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale

○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|-------|
|                                    |  |   |                  |     |      |                  | AL100 | AM15C |
| 5LKIR-V-UNJ14                      | 14   | 5 | 0,95             | 1,0 | 4,54 | 8,0              | ◆     | ◆     |
| 5LKIR-V-UNJ16                      | 16   | 5 | 0,83             | 1,0 | 4,41 | 7,8              | ◆     | ◆     |
| 5LKIR-V-UNJ18                      | 18   | 5 | 0,74             | 1,0 | 4,30 | 7,9              | ◆     | ◆     |
| 5LKIR-V-UNJ20                      | 20   | 5 | 0,66             | 0,9 | 4,21 | 7,8              | ◆     | ◆     |
| 5LKIR-V-UNJ24                      | 24   | 5 | 0,55             | 0,8 | 4,20 | 7,6              | ◆     | ◆     |
| 5LKIR-V-UNJ28                      | 28   | 5 | 0,47             | 0,6 | 3,99 | 7,6              | ◆     | ◆     |
| 5LKIR-V-UNJ32                      | 32   | 5 | 0,42             | 0,6 | 3,92 | 7,5              | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale

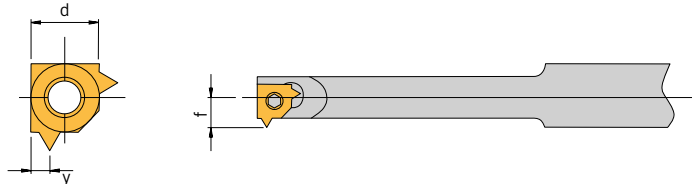
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

Aerospace thread - UNJ / Filettatura aeronautica - UNJ /  
Filetage aéronautique - UNJ



Right-hand execution shown  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|
|                                    |  |   |                  |     |      |                  | AM15C |
| 5LKIL-V-MJ1,00                     | 1,00                                       | 5 | 0,49             | 0,7 | 4,06 | 7,6              | ◆     |
| 5LKIL-V-MJ1,25                     | 1,25                                       | 5 | 0,61             | 0,9 | 4,21 | 7,8              | ◆     |
| 5LKIL-V-MJ1,50                     | 1,50                                       | 5 | 0,73             | 1,0 | 4,35 | 7,7              | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>mm<br>Passo<br>mm<br>Pas en<br>mm | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|-------|
|                                    |  |   |                  |     |      |                  | AL100 | AM15C |
| 5LKIR-V-MJ1,00                     | 1,00                                       | 5 | 0,49             | 0,7 | 4,06 | 7,6              | ◆     | ◆     |
| 5LKIR-V-MJ1,25                     | 1,25                                       | 5 | 0,61             | 0,9 | 4,21 | 7,8              | ◆     | ◆     |
| 5LKIR-V-MJ1,50                     | 1,50                                       | 5 | 0,73             | 1,0 | 4,35 | 7,7              | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

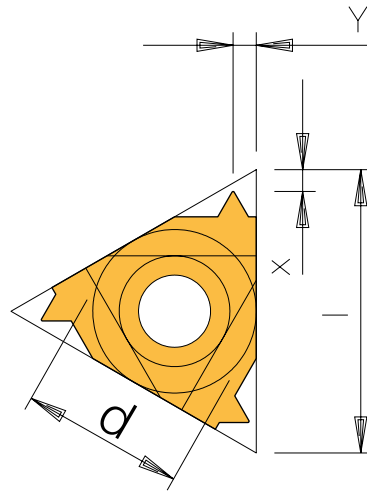
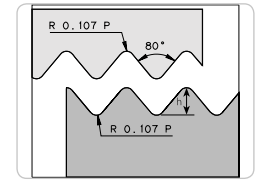
● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

9

## Internal thread / Filettatura interna / Filetage intérieur

**PG Thread (DIN40430) - PG** / Filettatura PG (DIN40430) - PG /  
Filetage pour tube (DIN40430) - PG



### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d     | h <sub>min</sub> | x   | y   | HC    |
|------------------------------------|--|----|-------|------------------|-----|-----|-------|
|                                    |  |    |       |                  |     |     | AL100 |
| <b>11IR-V-PG18</b>                 | 18   | 11 | 6,350 | 0,67             | 0,8 | 1,0 | ◆     |
| <b>16IR-V-PG16</b>                 | 16   | 16 | 9,525 | 0,76             | 0,8 | 1,1 | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ● |
| M | ● |
| K | ○ |
| N | ○ |
| S | ○ |
| H |   |

● Main application  
Applicazione principale  
Application principale

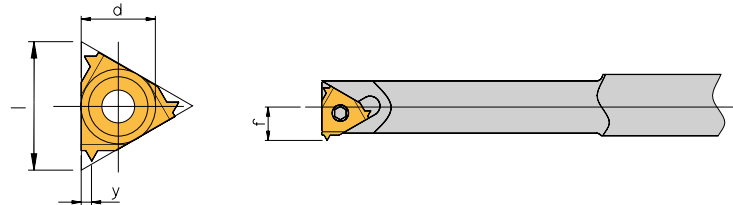
○ Secondary application  
Applicazione secondaria  
Application secondaire

## Internal thread / Filettatura interna / Filetage intérieur

**PG Thread (DIN40430) - PG** / Filettatura PG (DIN40430) - PG /  
Filetage pour tube (DIN40430) - PG



**Right-hand execution shown**  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|
|                                    |  |    |   |                  |     |     |                  | AM15C |
| <b>6KIL-V-PG18</b>                 | 18   | 10 | 6 | 0,67             | 0,9 | 5,3 | 10               | ◆     |
| <b>6KIL-V-PG20</b>                 | 20   | 10 | 6 | 0,61             | 0,8 | 5,3 | 10               | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | l  | d | h <sub>min</sub> | y   | f   | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|----|---|------------------|-----|-----|------------------|-------|-------|
|                                    |  |    |   |                  |     |     |                  | AL100 | AM15C |
| <b>6KIR-V-PG18</b>                 | 18   | 10 | 6 | 0,67             | 0,9 | 5,3 | 10               | ◆     | ◆     |
| <b>6KIR-V-PG20</b>                 | 20   | 10 | 6 | 0,61             | 0,8 | 5,3 | 10               | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

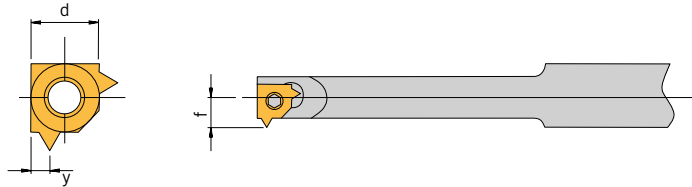


## Internal thread / Filettatura interna / Filetage intérieur

**PG Thread (DIN40430) - PG / Filettatura PG (DIN40430) - PG /**  
Filetage pour tube (DIN40430) - PG



**Right-hand execution shown**  
Versione destra in figura  
Version représentée à droite



### Left-hand design / Versione sinistra / Modèle à gauche

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|
|                                    |  |   |                  |     |      |                  | AM15C |
| <b>5LKIL-V-PG18</b>                | 18   | 5 | 0,67             | 0,9 | 4,65 | 8                | ◆     |
| <b>5LKIL-V-PG20</b>                | 20   | 5 | 0,61             | 0,8 | 4,65 | 8                | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |
|---|---|
| P | ○ |
| M | ● |
| K |   |
| N |   |
| S |   |
| H |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

### Right-hand design / Versione destra / Modèle à droite

| Designation<br>Articolo<br>Article | Pitch<br>inch<br>Passo<br>inch<br>Pas en<br>inch | d | h <sub>min</sub> | y   | f    | D <sub>min</sub> | HC    | HC    |
|------------------------------------|--|---|------------------|-----|------|------------------|-------|-------|
|                                    |  |   |                  |     |      |                  | AL100 | AM15C |
| <b>5LKIR-V-PG18</b>                | 18   | 5 | 0,67             | 0,9 | 4,65 | 8                | ◆     | ◆     |
| <b>5LKIR-V-PG20</b>                | 20   | 5 | 0,61             | 0,8 | 4,65 | 8                | ◆     | ◆     |

HC = Solid carbide coated / Metallo duro rivestito / Carbure avec revêtement

|   |   |   |
|---|---|---|
| P | ● | ○ |
| M | ● | ● |
| K | ○ |   |
| N |   |   |
| S | ○ |   |
| H |   |   |

● Main application  
Applicazione principale  
Application principale  
○ Secondary application  
Applicazione secondaria  
Application secondaire

9

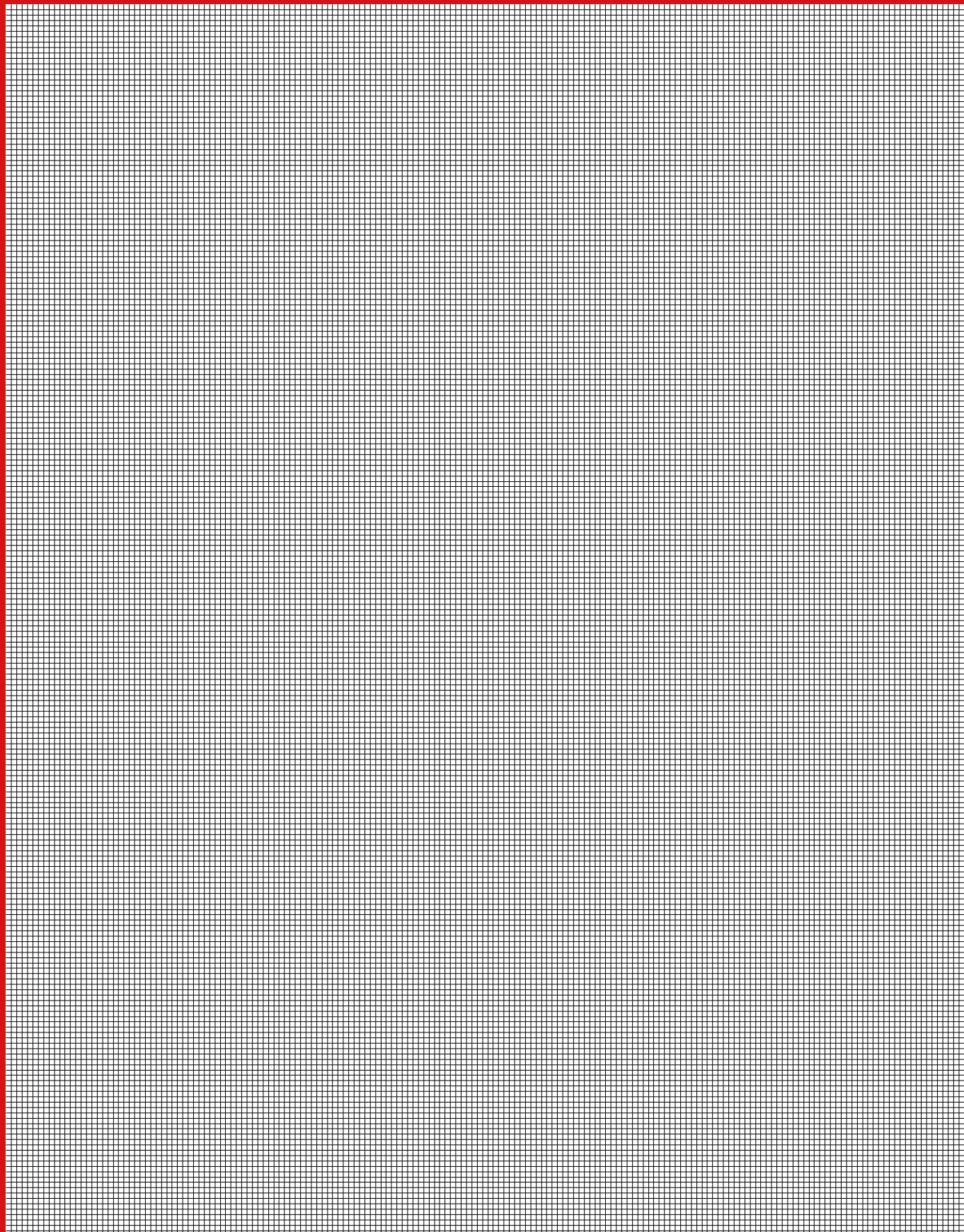
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| Material group   | Structure of the material groups and identification letters |   | Brinell hardness HB | Tensile strength Rm (N/mm <sup>2</sup> ) | Chipping group | Cutting speed Vc (m/min) |                          |                |
|------------------|---|---|---------------------|--|----------------|--------------------------|--------------------------|----------------|
|                  |   |   |                     |  |                | HC                       |                          |                |
|                  |   |   |                     |  |                | AL100 (Standard)         | AL100 (5LKI... / 6KI...) | AM7C           |
| <b>P</b>         | Unalloyed steel   | C ≤ 0.25 % annealed                             | 125                 | 428                                      | P1             | 115 - 153 - 190          | 140 - 170 - 200          | -              |
|                  |   | C >= 0.25 ... >= 0.55 % annealed                | 190                 | 639                                      | P2             | 100 - 138 - 175          | 120 - 150 - 180          | -              |
|                  |   | C >= 0.25 ... >= 0.55 % hardened and tempered   | 210                 | 708                                      | P3             | 100 - 138 - 175          | 120 - 150 - 180          | -              |
|                  |   | C ≤ 0.55 % annealed                             | 190                 | 639                                      | P4             | 90 - 128 - 165           | 110 - 145 - 180          | -              |
|                  |   | C ≤ 0.55 % hardened and tempered                | 300                 | 1013                                     | P5             | 90 - 128 - 165           | 110 - 145 - 180          | -              |
|                  | Low alloyed steel   | Machinig steel (short-clipping) annealed        | 220                 | 745                                      | P6             | 90 - 128 - 165           | 110 - 145 - 180          | -              |
|                  |   | annealed  | 175                 | 591                                      | P7             | 100 - 140 - 180          | 100 - 128 - 155          | -              |
|                  |   | hardened and tempered                           | 300                 | 1013                                     | P8             | 75 - 108 - 140           | 90 - 118 - 145           | -              |
|                  |   | hardened and tempered                           | 380                 | 1282                                     | P9             | 70 - 103 - 135           | 80 - 108 - 135           | -              |
|                  |   | hardened and tempered                           | 430                 | 1477                                     | P10            | 70 - 103 - 135           | 80 - 107.5 - 135         | -              |
|                  | High alloyed steel and high alloyed tool steel              | annealed  | 200                 | 675                                      | P11            | 80 - 100 - 120           | 65 - 90 - 115            | -              |
|                  |   | hardened  | 300                 | 1013                                     | P12            | 50 - 75 - 100            | 50 - 75 - 100            | -              |
|                  |   | hardened  | 400                 | 1361                                     | P13            | 50 - 75 - 100            | 50 - 75 - 100            | -              |
|                  | Stainless steel   | ferretic / martensitic, annealed                | 200                 | 675                                      | P14            | 70 - 100 - 130           | 80 - 100 - 120           | 70 - 110 - 150 |
|                  |   | martensitic, hardened and tempered              | 330                 | 1114                                     | P15            | 60 - 88 - 115            | 55 - 75 - 95             | 60 - 93 - 125  |
| <b>M</b>         | Stainless steel   | austenitic, chilled                             | 200                 | 675                                      | M1             | 90 - 115 - 140           | 60 - 80 - 100            | 90 - 125 - 160 |
|                  |   | austenitic, precipitation-hardened (PH)         | 300                 | 1013                                     | M2             | 40 - 75 - 110            | 50 - 70 - 90             | 40 - 80 - 120  |
|                  |   | austenitic-ferretic, Duplex                     | 230                 | 778                                      | M3             | 40 - 75 - 110            | 50 - 70 - 90             | 40 - 80 - 120  |
| <b>K</b>         | Malleable cast iron   | ferritic  | 200                 | 675                                      | K1             | 60 - 65 - 70             | 60 - 70 - 80             | -              |
|                  |   | pearlitic                                       | 260                 | 867                                      | K2             | 60 - 103 - 145           | 60 - 70 - 80             | -              |
| <b>K</b>         | Cast iron   | low tensile strength                            | 180                 | 602                                      | K3             | 70 - 100 - 130           | 60 - 70 - 80             | -              |
|                  |   | high tensile strength / austenitic              | 245                 | 825                                      | K4             | 60 - 88 - 115            | 40 - 55 - 70             | -              |
|                  | Cast iron with nodular graphite                             | ferritic  | 155                 | 518                                      | K5             | 125 - 143 - 160          | 60 - 70 - 80             | -              |
| <b>K</b>         | GGV (CGI)   | pearlitic                                       | 265                 | 885                                      | K6             | 90 - 105 - 120           | 70 - 80 - 90             | -              |
|                  |   |   | 200                 | 675                                      | K7             | -                        | -                        | -              |
| <b>N</b>         | Aluminium alloys long chipping                              | not heat treatable                              | 30                  | -  | N1             | -                        | -                        | -              |
|                  |   | heat treatable, heat treated                    | 100                 | 343                                      | N2             | 80 - 150 - 220           | 100 - 135 - 170          | -              |
|                  |   | ≤ 12 % Si, not heat treatable                   | 75                  | 260                                      | N3             | 200 - 300 - 400          | 100 - 125 - 150          | -              |
|                  | Casted aluminium alloys                                     | ≤ 12 % Si, heat treatable, heat treated         | 90                  | 314                                      | N4             | 200 - 240 - 280          | 60 - 80 - 100            | -              |
|                  |   | > 12 % Si, not heat treatable                   | 130                 | 447                                      | N5             | 60 - 120 - 180           | 100 - 125 - 150          | -              |
|                  | Magnesium alloys  | > 12 % Si, not heat treatable                   | 70                  | 250                                      | N6             | -                        | -                        | -              |
|                  |   | Unalloyed, electrolyte copper                   | 100                 | 343                                      | N7             | -                        | -                        | -              |
|                  | Copper and copper alloys (Brass / Bronze)                   | Brass, Bronze                                   | 90                  | 314                                      | N8             | 80 - 153 - 225           | 80 - 140 - 200           | -              |
|                  |   | Cu-alloys, short-chipping                       | 110                 | 382                                      | N9             | 80 - 153 - 225           | 80 - 140 - 200           | -              |
|                  |   |   | 300                 | 1013                                     | N10            | -                        | -                        | -              |
|                  | Non-ferrous materials                                       | Lead alloys (without abrasive filling material) | -                   | -  | N11            | -                        | -                        | -              |
|                  |   | Duroplastic (without abrasive filling material) | -                   | -  | N12            | -                        | -                        | -              |
|                  |   | Plastic glas fibre reinforced GFRP              | -                   | -  | N13            | -                        | -                        | -              |
|                  |   | Plastic carbon fibre reinforced CFRP            | -                   | -  | N14            | -                        | -                        | -              |
|                  |   | Plastic aramid fibre reinforced AFRP            | -                   | -  | N15            | -                        | -                        | -              |
| Graphite (tech.) |   | 80 Shore  | -                   | N16                                      | -              | -                        | -                        |                |
| <b>S</b>         | High temperature resistant alloys                           | Fe-based annealed                               | 200                 | 675                                      | S1             | 45 - 53 - 60             | 25 - 35 - 45             | -              |
|                  |   | Fe-based heat treated                           | 280                 | 943                                      | S2             | 30 - 40 - 50             | 20 - 25 - 30             | -              |
|                  |   | Ni- or Co-alloyed annealed                      | 250                 | 839                                      | S3             | 20 - 25 - 30             | 15 - 18 - 20             | -              |
|                  |   | Ni- or Co-alloyed heat treated                  | 350                 | 1177                                     | S4             | 15 - 20 - 25             | 10 - 13 - 15             | -              |
|                  |   | Ni- or Co-alloyed casting                       | 320                 | 1076                                     | S5             | -                        | -                        | -              |
|                  | Titanium alloys   | Pure titan                                      | 200                 | 675                                      | S6             | 140 - 155 - 170          | 60 - 80 - 100            | -              |
|                  |   | α- and β-alloys, heat treated                   | 375                 | 1262                                     | S7             | 40 - 55 - 70             | 40 - 45 - 50             | -              |
|                  |   | β-alloys  | 410                 | 1396                                     | S8             | -                        | -                        | -              |
|                  | Wolfram alloys  |   | 300                 | 1013                                     | S9             | -                        | -                        | -              |
|                  | Molybdän alloys   |   | 300                 | 1013                                     | S10            | -                        | -                        | -              |
| <b>H</b>         | Hardened steel  | hardened  | 50 HRC              | -  | H1             | 45 - 53 - 60             | 20 - 30 - 40             | -              |
|                  |   | hardened  | 55 HRC              | -  | H2             | 40 - 45 - 50             | 20 - 30 - 40             | -              |
|                  |   | hardened  | 60 HRC              | -  | H3             | -                        | -                        | -              |
|                  | Hardened cast iron  | hardened  | 55 HRC              | -  | H4             | -                        | -                        | -              |

The recommended cutting data are only approximate values.  
 It may be necessary to adjust them to each individual machining application.  
 HC = Solid carbide coated  
 HU = Solid carbide uncoated

| HC                  |                               | HU             |
|---------------------|-------------------------------|----------------|
| AM15C<br>(Standard) | AM15C<br>(5LKI...<br>/6KI...) | AK20           |
| 115 - 153 - 190     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | 80 - 120 - 160 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 80 - 100 - 120 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 70 - 85 - 100  |
| 90 - 128 - 165      | 40 - 60 - 80                  | 50 - 85 - 120  |
| 100 - 140 - 180     | 40 - 60 - 80                  | -              |
| 75 - 108 - 140      | 40 - 60 - 80                  | -              |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 80 - 100 - 120      | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 70 - 100 - 130      | 40 - 50 - 60                  | -              |
| 60 - 88 - 115       | 40 - 50 - 60                  | -              |
| 90 - 115 - 140      | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | 30 - 40 - 50   |
| 60 - 65 - 70        | 40 - 60 - 80                  | 25 - 33 - 40   |
| 60 - 103 - 145      | 40 - 60 - 80                  | 20 - 25 - 30   |
| 70 - 100 - 130      | 40 - 60 - 80                  | 15 - 20 - 25   |
| 60 - 88 - 115       | 40 - 60 - 80                  | -              |
| 125 - 143 - 160     | 40 - 60 - 80                  | 60 - 80 - 100  |
| 90 - 105 - 120      | 40 - 60 - 80                  | 40 - 50 - 60   |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 150 - 220      | 40 - 80 - 120                 | -              |
| 200 - 300 - 400     | 40 - 80 - 120                 | -              |
| 200 - 240 - 280     | 40 - 80 - 120                 | -              |
| 60 - 120 - 180      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 30 - 38 - 45                  | -              |
| 30 - 40 - 50        | 20 - 25 - 30                  | -              |
| 20 - 25 - 30        | 15 - 18 - 20                  | -              |
| 15 - 20 - 25        | 15 - 18 - 20                  | -              |
| -                   | -                             | -              |
| 140 - 155 - 170     | 70 - 85 - 100                 | -              |
| 50 - 60 - 70        | 40 - 45 - 50                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 20 - 30 - 40                  | -              |
| 40 - 45 - 50        | 20 - 30 - 40                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |

| Gruppo materiale                  | Struttura dei gruppi di materiali e lettere di riferimento |   | Durezza Brinell | Resistenza Rm (N/mm <sup>2</sup> ) | Gruppo di lavoro | Velocità di taglio Vc (m/min) |                         |                |  |
|-----------------------------------|--|---|-----------------|------------------------------------|------------------|-------------------------------|-------------------------|----------------|--|
|                                   |  |   |                 |                                    |                  | HC                            |                         |                |  |
|                                   |  |   |                 |                                    |                  | AL100 (Standard)              | AL100 (SLK1... /GK1...) | AM7C           |  |
| <b>P</b>                          | Acciai non legato  | C ≤ 0,25 %<br>ricotto                                     | 125             | 428                                | P1               | 115 - 153 - 190               | 140 - 170 - 200         | -              |  |
|                                   |  | C >= 0,25 ... >= 0,55 %<br>ricotto                        | 190             | 639                                | P2               | 100 - 138 - 175               | 120 - 150 - 180         | -              |  |
|                                   |  | C >= 0,25 ... >= 0,55 %<br>bonificato                     | 210             | 708                                | P3               | 100 - 138 - 175               | 120 - 150 - 180         | -              |  |
|                                   |  | C ≤ 0,55 %<br>ricotto                                     | 190             | 639                                | P4               | 90 - 128 - 165                | 110 - 145 - 180         | -              |  |
|                                   |  | C ≤ 0,55 %<br>bonificato                                  | 300             | 1013                               | P5               | 90 - 128 - 165                | 110 - 145 - 180         | -              |  |
|                                   | Acciai debolmente legati                                   | Acciaio (truciolo corto)<br>ricotto                       | 220             | 745                                | P6               | 90 - 128 - 165                | 110 - 145 - 180         | -              |  |
|                                   |  | ricotto   | 175             | 591                                | P7               | 100 - 140 - 180               | 100 - 128 - 155         | -              |  |
|                                   |  | bonificato  | 300             | 1013                               | P8               | 75 - 108 - 140                | 90 - 118 - 145          | -              |  |
|                                   |  | bonificato  | 380             | 1282                               | P9               | 70 - 103 - 135                | 80 - 108 - 135          | -              |  |
|                                   |  | bonificato  | 430             | 1477                               | P10              | 70 - 103 - 135                | 80 - 107,5 - 135        | -              |  |
|                                   | Acciai fortemente legati e acciai da utensili              | ricotto   | 200             | 675                                | P11              | 80 - 100 - 120                | 65 - 90 - 115           | -              |  |
|                                   |  | temprato e rinvenuto                                      | 300             | 1013                               | P12              | 50 - 75 - 100                 | 50 - 75 - 100           | -              |  |
|                                   |  | temprato e rinvenuto                                      | 400             | 1361                               | P13              | 50 - 75 - 100                 | 50 - 75 - 100           | -              |  |
|                                   | Acciai inossidabili  | ferritico / martensitico, ricotto                         | 200             | 675                                | P14              | 70 - 100 - 130                | 80 - 100 - 120          | 70 - 110 - 150 |  |
| martensitico, bonificato          |  | 330   | 1114            | P15                                | 60 - 88 - 115    | 55 - 75 - 95                  | 60 - 93 - 125           |                |  |
| austenitico, trattato o temperato |  | 200   | 675             | M1                                 | 90 - 115 - 140   | 60 - 80 - 100                 | 90 - 125 - 160          |                |  |
| <b>M</b>                          | Acciai inossidabili  | austenitico, indurimento per precipitazione (PH)          | 300             | 1013                               | M2               | 40 - 75 - 110                 | 50 - 70 - 90            | 40 - 80 - 120  |  |
|                                   |  | austenitico-ferritico, Duplex                             | 230             | 778                                | M3               | 40 - 75 - 110                 | 50 - 70 - 90            | 40 - 80 - 120  |  |
| <b>K</b>                          | Ghisa temprata   | ferritico   | 200             | 675                                | K1               | 60 - 65 - 70                  | 60 - 70 - 80            | -              |  |
|                                   |  | perlitica   | 260             | 867                                | K2               | 60 - 103 - 145                | 60 - 70 - 80            | -              |  |
|                                   | Ghisa grigia   | bassa resistenza  | 180             | 602                                | K3               | 70 - 100 - 130                | 60 - 70 - 80            | -              |  |
|                                   |  | alta resistenza / austenitico                             | 245             | 825                                | K4               | 60 - 88 - 115                 | 40 - 55 - 70            | -              |  |
|                                   | Ghisa sferoidale   | ferritico   | 155             | 518                                | K5               | 125 - 143 - 160               | 60 - 70 - 80            | -              |  |
|                                   |  | perlitica   | 265             | 885                                | K6               | 90 - 105 - 120                | 70 - 80 - 90            | -              |  |
| GGV (CGI)                         |  | 200   | 675             | K7                                 | -                | -                             | -                       |                |  |
| <b>N</b>                          | Leghe di Alluminio stampato                                | non invecchiato   | 30              | -                                  | N1               | -                             | -                       | -              |  |
|                                   |  | rinvenuto, invecchiato                                    | 100             | 343                                | N2               | 80 - 150 - 220                | 100 - 135 - 170         | -              |  |
|                                   | Leghe di Alluminio da fusione                              | ≤ 12 % Si, non invecchiato                                | 75              | 260                                | N3               | 200 - 300 - 400               | 100 - 125 - 150         | -              |  |
|                                   |  | ≤ 12 % Si, rinvenuto, invecchiato                         | 90              | 314                                | N4               | 200 - 240 - 280               | 60 - 80 - 100           | -              |  |
|                                   | Leghe di magnesio  | > 12 % Si, non invecchiato                                | 130             | 447                                | N5               | 60 - 120 - 180                | 100 - 125 - 150         | -              |  |
|                                   |  | > 12 % Si, non invecchiato                                | 70              | 250                                | N6               | -                             | -                       | -              |  |
|                                   | Rame e Leghe di Rame (Bronzo / Ottone)                     | Non legati, Rame Elettrolitico                            | 100             | 343                                | N7               | -                             | -                       | -              |  |
|                                   |  | Ottone, Bronzo  | 90              | 314                                | N8               | 80 - 153 - 225                | 80 - 140 - 200          | -              |  |
|                                   |  | Leghe Cu, truciolo corto                                  | 110             | 382                                | N9               | 80 - 153 - 225                | 80 - 140 - 200          | -              |  |
|                                   |  |   | 300             | 1013                               | N10              | -                             | -                       | -              |  |
|                                   | Materiali non metallici                                    | Leghe al piombo (senza materiale di riempimento abrasivo) | -               | -                                  | N11              | -                             | -                       | -              |  |
|                                   |  | Duroplastico (senza materiale di riempimento abrasivo)    | -               | -                                  | N12              | -                             | -                       | -              |  |
|                                   |  | Plastica rinforzata in fibra di vetro GFRP                | -               | -                                  | N13              | -                             | -                       | -              |  |
|                                   |  | Plastica rinforzata in fibra di carbonio CFRP             | -               | -                                  | N14              | -                             | -                       | -              |  |
|                                   |  | Plastica rinforzata in fibra aramidica AFRP               | -               | -                                  | N15              | -                             | -                       | -              |  |
|                                   |  | Grafite (tecnico)   | 80 Shore        | -                                  | N16              | -                             | -                       | -              |  |
| <b>S</b>                          | Leghe resistenti al calore                                 | Base-Fe<br>ricotto  | 200             | 675                                | S1               | 45 - 53 - 60                  | 25 - 35 - 45            | -              |  |
|                                   |  | Base-Fe<br>invecchiato                                    | 280             | 943                                | S2               | 30 - 40 - 50                  | 20 - 25 - 30            | -              |  |
|                                   |  | Base Ni o Co<br>ricotto                                   | 250             | 839                                | S3               | 20 - 25 - 30                  | 15 - 18 - 20            | -              |  |
|                                   |  | Base Ni o Co<br>invecchiato                               | 350             | 1177                               | S4               | 15 - 20 - 25                  | 10 - 13 - 15            | -              |  |
|                                   |  | Base Ni o Co<br>da fusione                                | 320             | 1076                               | S5               | -                             | -                       | -              |  |
|                                   | Leghe di Titanio   | Titanio puro  | 200             | 675                                | S6               | 140 - 155 - 170               | 60 - 80 - 100           | -              |  |
|                                   |  | Leghe α e β, invecchiato                                  | 375             | 1262                               | S7               | 40 - 55 - 70                  | 40 - 45 - 50            | -              |  |
|                                   |  | Leghe β   | 410             | 1396                               | S8               | -                             | -                       | -              |  |
|                                   | Leghe di tungsteno   |   | 300             | 1013                               | S9               | -                             | -                       | -              |  |
|                                   | Leghe di molibdeno   |   | 300             | 1013                               | S10              | -                             | -                       | -              |  |
| <b>H</b>                          | Acciaio Temprato   | temprato e rinvenuto                                      | 50 HRC          | -                                  | H1               | 45 - 53 - 60                  | 20 - 30 - 40            | -              |  |
|                                   |  | temprato e rinvenuto                                      | 55 HRC          | -                                  | H2               | 40 - 45 - 50                  | 20 - 30 - 40            | -              |  |
|                                   |  | temprato e rinvenuto                                      | 60 HRC          | -                                  | H3               | -                             | -                       | -              |  |
|                                   | Ghisa Temprata   | temprato e rinvenuto                                      | 55 HRC          | -                                  | H4               | -                             | -                       | -              |  |

I dati indicati in tabella sono valori approssimati.

Può essere necessario adattarli alle singole applicazioni di lavorazione.

HC = Metallo duro rivestito

HU = Metallo duro non rivestito

| HC                  |                               | HU             |
|---------------------|-------------------------------|----------------|
| AM15C<br>(Standard) | AM15C<br>(5LKI...<br>/6KI...) | AK20           |
| 115 - 153 - 190     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | 80 - 120 - 160 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 80 - 100 - 120 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 70 - 85 - 100  |
| 90 - 128 - 165      | 40 - 60 - 80                  | 50 - 85 - 120  |
| 100 - 140 - 180     | 40 - 60 - 80                  | -              |
| 75 - 108 - 140      | 40 - 60 - 80                  | -              |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 80 - 100 - 120      | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 70 - 100 - 130      | 40 - 50 - 60                  | -              |
| 60 - 88 - 115       | 40 - 50 - 60                  | -              |
| 90 - 115 - 140      | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | 30 - 40 - 50   |
| 60 - 65 - 70        | 40 - 60 - 80                  | 25 - 33 - 40   |
| 60 - 103 - 145      | 40 - 60 - 80                  | 20 - 25 - 30   |
| 70 - 100 - 130      | 40 - 60 - 80                  | 15 - 20 - 25   |
| 60 - 88 - 115       | 40 - 60 - 80                  | -              |
| 125 - 143 - 160     | 40 - 60 - 80                  | 60 - 80 - 100  |
| 90 - 105 - 120      | 40 - 60 - 80                  | 40 - 50 - 60   |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 150 - 220      | 40 - 80 - 120                 | -              |
| 200 - 300 - 400     | 40 - 80 - 120                 | -              |
| 200 - 240 - 280     | 40 - 80 - 120                 | -              |
| 60 - 120 - 180      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 30 - 38 - 45                  | -              |
| 30 - 40 - 50        | 20 - 25 - 30                  | -              |
| 20 - 25 - 30        | 15 - 18 - 20                  | -              |
| 15 - 20 - 25        | 15 - 18 - 20                  | -              |
| -                   | -                             | -              |
| 140 - 155 - 170     | 70 - 85 - 100                 | -              |
| 50 - 60 - 70        | 40 - 45 - 50                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 20 - 30 - 40                  | -              |
| 40 - 45 - 50        | 20 - 30 - 40                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |

| Groupe de matériaux                   | Structure des groupes de matériaux et des lettres de référence |   | Dureté Brinell | Résistance RM (N/mm <sup>2</sup> ) | Groupe de travail | Vitesse de coupe Vc (m/min) |                         |                |
|---------------------------------------|--|---|----------------|------------------------------------|-------------------|-----------------------------|-------------------------|----------------|
|                                       |  |   |                |                                    |                   | HC                          |                         |                |
|                                       |  |   |                |                                    |                   | AL100 (Standard)            | AL100 (SLK1... /GK1...) | AM7C           |
| P                                     | Acier non allié  | C ≤ 0,25 % recuit                                   | 125            | 428                                | P1                | 115 - 153 - 190             | 140 - 170 - 200         | -              |
|                                       |  | C >= 0,25 ... >= 0,55 % recuit                      | 190            | 639                                | P2                | 100 - 138 - 175             | 120 - 150 - 180         | -              |
|                                       |  | C >= 0,25 ... >= 0,55 % traité                      | 210            | 708                                | P3                | 100 - 138 - 175             | 120 - 150 - 180         | -              |
|                                       |  | C ≤ 0,55 % recuit                                   | 190            | 639                                | P4                | 90 - 128 - 165              | 110 - 145 - 180         | -              |
|                                       |  | C ≤ 0,55 % traité                                   | 300            | 1013                               | P5                | 90 - 128 - 165              | 110 - 145 - 180         | -              |
|                                       |  | Aciers de décolletage (à copeaux courts) recuit     | 220            | 745                                | P6                | 90 - 128 - 165              | 110 - 145 - 180         | -              |
|                                       | Acier faiblement allié   | recuit  | 175            | 591                                | P7                | 100 - 140 - 180             | 100 - 128 - 155         | -              |
|                                       |  | traité  | 300            | 1013                               | P8                | 75 - 108 - 140              | 90 - 118 - 145          | -              |
|                                       |  | traité  | 380            | 1282                               | P9                | 70 - 103 - 135              | 80 - 108 - 135          | -              |
|                                       |  | traité  | 430            | 1477                               | P10               | 70 - 103 - 135              | 80 - 107,5 - 135        | -              |
|                                       | Acier allié et acier outil allié                               | recuit  | 200            | 675                                | P11               | 80 - 100 - 120              | 65 - 90 - 115           | -              |
|                                       |  | trempe et revenu                                    | 300            | 1013                               | P12               | 50 - 75 - 100               | 50 - 75 - 100           | -              |
|                                       |  | trempe et revenu                                    | 400            | 1361                               | P13               | 50 - 75 - 100               | 50 - 75 - 100           | -              |
|                                       | Acier inox   | ferritique, martensitique, recuit                   | 200            | 675                                | P14               | 70 - 100 - 130              | 80 - 100 - 120          | 70 - 110 - 150 |
| martensitique, traité                 |  | 330   | 1114           | P15                                | 60 - 88 - 115     | 55 - 75 - 95                | 60 - 93 - 125           |                |
| M                                     | Acier inox   | austénitique  | 200            | 675                                | M1                | 90 - 115 - 140              | 60 - 80 - 100           | 90 - 125 - 160 |
|                                       |  | austénitique  | 300            | 1013                               | M2                | 40 - 75 - 110               | 50 - 70 - 90            | 40 - 80 - 120  |
|                                       |  | austénitique-ferritique, Duplex                     | 230            | 778                                | M3                | 40 - 75 - 110               | 50 - 70 - 90            | 40 - 80 - 120  |
| K                                     | Fonte malléable  | ferritique  | 200            | 675                                | K1                | 60 - 65 - 70                | 60 - 70 - 80            | -              |
|                                       |  | perlitique  | 260            | 867                                | K2                | 60 - 103 - 145              | 60 - 70 - 80            | -              |
|                                       | Fonte grise  | faible résistance                                   | 180            | 602                                | K3                | 70 - 100 - 130              | 60 - 70 - 80            | -              |
|                                       |  | haute résistance / austénitique                     | 245            | 825                                | K4                | 60 - 88 - 115               | 40 - 55 - 70            | -              |
|                                       | Fonte à Graphite sphéroïdale                                   | ferritique  | 155            | 518                                | K5                | 125 - 143 - 160             | 60 - 70 - 80            | -              |
|                                       |  | perlitique  | 265            | 885                                | K6                | 90 - 105 - 120              | 70 - 80 - 90            | -              |
| GGV (CGI)                             |  | 200   | 675            | K7                                 | -                 | -                           | -                       |                |
| N                                     | Alliages de fonderie d'aluminium                               | ne pouvant pas subir un durcissement                | 30             | -                                  | N1                | -                           | -                       | -              |
|                                       |  | pouvant subir un durcissement, durci                | 100            | 343                                | N2                | 80 - 150 - 220              | 100 - 135 - 170         | -              |
|                                       | Alliage de fonte d'aluminium                                   | ≤ 12 % Si, ne pouvant pas subir de durcissement     | 75             | 260                                | N3                | 200 - 300 - 400             | 100 - 125 - 150         | -              |
|                                       |  | ≤ 12 % Si, pouvant subir un durcissement, durci     | 90             | 314                                | N4                | 200 - 240 - 280             | 60 - 80 - 100           | -              |
|                                       |  | > 12 % Si, ne pouvant pas subir de durcissement     | 130            | 447                                | N5                | 60 - 120 - 180              | 100 - 125 - 150         | -              |
|                                       | Alliage de Magnésium   | > 12 % Si, ne pouvant pas subir de durcissement     | 70             | 250                                | N6                | -                           | -                       | -              |
|                                       |  | non allié, cuivre électrolytique                    | 100            | 343                                | N7                | -                           | -                       | -              |
|                                       | Cuivre et alliage de cuivre (bronze / laiton)                  | Laiton, bronze, fonte rouge                         | 90             | 314                                | N8                | 80 - 153 - 225              | 80 - 140 - 200          | -              |
|                                       |  | Alliage de cuivre à copeaux courts                  | 110            | 382                                | N9                | 80 - 153 - 225              | 80 - 140 - 200          | -              |
|                                       |  | forte résistance, Ampco                             | 300            | 1013                               | N10               | -                           | -                       | -              |
|                                       | Matériaux non métalliques                                      | Thermoplaste (sans agents de charge abrasives)      | -              | -                                  | N11               | -                           | -                       | -              |
|                                       |  | Duroplaste (sans agents de charge abrasives)        | -              | -                                  | N12               | -                           | -                       | -              |
|                                       |  | Matière plastique renforcée de fibres de verre GFRP | -              | -                                  | N13               | -                           | -                       | -              |
|                                       |  | Matière plastique renforcé composite CFRP           | -              | -                                  | N14               | -                           | -                       | -              |
| Plastique renforcé fibre aramide AFRP |  | -   | -              | N15                                | -                 | -                           | -                       |                |
| Graphite                              |  | 80 Shore  | -              | N16                                | -                 | -                           | -                       |                |
| S                                     | Alliages réfractaires  | à base de Fe recuit                                 | 200            | 675                                | S1                | 45 - 53 - 60                | 25 - 35 - 45            | -              |
|                                       |  | à base de Fe durci                                  | 280            | 943                                | S2                | 30 - 40 - 50                | 20 - 25 - 30            | -              |
|                                       |  | à base Ni ou Co recuit                              | 250            | 839                                | S3                | 20 - 25 - 30                | 15 - 18 - 20            | -              |
|                                       |  | à base Ni ou Co durci                               | 350            | 1177                               | S4                | 15 - 20 - 25                | 10 - 13 - 15            | -              |
|                                       |  | à base Ni ou Co jeter                               | 320            | 1076                               | S5                | -                           | -                       | -              |
|                                       | Alliage de titane  | Titane pur  | 200            | 675                                | S6                | 140 - 155 - 170             | 60 - 80 - 100           | -              |
|                                       |  | Alliages Alpha + Beta, trempé                       | 375            | 1262                               | S7                | 40 - 55 - 70                | 40 - 45 - 50            | -              |
|                                       |  | Alliages Beta                                       | 410            | 1396                               | S8                | -                           | -                       | -              |
|                                       | Alliage de tungstène   |   | 300            | 1013                               | S9                | -                           | -                       | -              |
|                                       | Alliage de molybdène   |   | 300            | 1013                               | S10               | -                           | -                       | -              |
| H                                     | Acier trempé   | trempe et revenu                                    | 50 HRC         | -                                  | H1                | 45 - 53 - 60                | 20 - 30 - 40            | -              |
|                                       |  | trempe et revenu                                    | 55 HRC         | -                                  | H2                | 40 - 45 - 50                | 20 - 30 - 40            | -              |
|                                       |  | trempe et revenu                                    | 60 HRC         | -                                  | H3                | -                           | -                       | -              |
|                                       | Fonte durci  | trempe et revenu                                    | 55 HRC         | -                                  | H4                | -                           | -                       | -              |

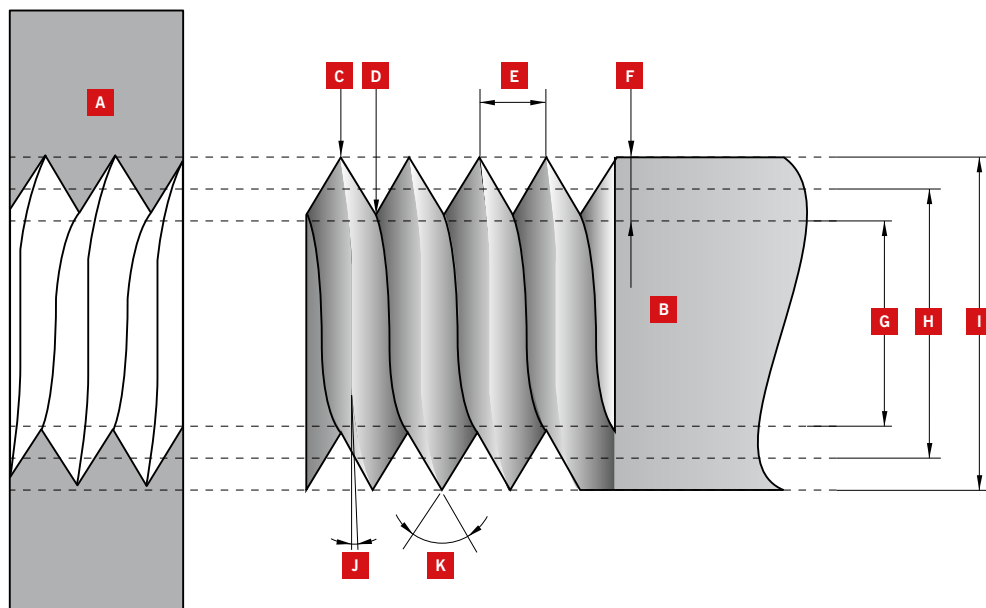
Les données affichées dans le tableau sont des valeurs approximatives.  
 Il peut être nécessaire de les adapter à des applications d'usinage individuelles.  
 HC = Carbure avec revêtement  
 HU = Carbure sans revêtement

| HC                  |                               | HU             |
|---------------------|-------------------------------|----------------|
| AM15C<br>(Standard) | AM15C<br>(5LKI...<br>/6KI...) | AK20           |
| 115 - 153 - 190     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | -              |
| 100 - 138 - 175     | 40 - 60 - 80                  | 80 - 120 - 160 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 80 - 100 - 120 |
| 90 - 128 - 165      | 40 - 60 - 80                  | 70 - 85 - 100  |
| 90 - 128 - 165      | 40 - 60 - 80                  | 50 - 85 - 120  |
| 100 - 140 - 180     | 40 - 60 - 80                  | -              |
| 75 - 108 - 140      | 40 - 60 - 80                  | -              |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 70 - 103 - 135      | 40 - 60 - 80                  | 70 - 120 - 170 |
| 80 - 100 - 120      | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 50 - 75 - 100       | 40 - 50 - 60                  | -              |
| 70 - 100 - 130      | 40 - 50 - 60                  | -              |
| 60 - 88 - 115       | 40 - 50 - 60                  | -              |
| 90 - 115 - 140      | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | -              |
| 40 - 75 - 110       | 40 - 50 - 60                  | 30 - 40 - 50   |
| 60 - 65 - 70        | 40 - 60 - 80                  | 25 - 33 - 40   |
| 60 - 103 - 145      | 40 - 60 - 80                  | 20 - 25 - 30   |
| 70 - 100 - 130      | 40 - 60 - 80                  | 15 - 20 - 25   |
| 60 - 88 - 115       | 40 - 60 - 80                  | -              |
| 125 - 143 - 160     | 40 - 60 - 80                  | 60 - 80 - 100  |
| 90 - 105 - 120      | 40 - 60 - 80                  | 40 - 50 - 60   |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 150 - 220      | 40 - 80 - 120                 | -              |
| 200 - 300 - 400     | 40 - 80 - 120                 | -              |
| 200 - 240 - 280     | 40 - 80 - 120                 | -              |
| 60 - 120 - 180      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| 80 - 153 - 225      | 40 - 80 - 120                 | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 30 - 38 - 45                  | -              |
| 30 - 40 - 50        | 20 - 25 - 30                  | -              |
| 20 - 25 - 30        | 15 - 18 - 20                  | -              |
| 15 - 20 - 25        | 15 - 18 - 20                  | -              |
| -                   | -                             | -              |
| 140 - 155 - 170     | 70 - 85 - 100                 | -              |
| 50 - 60 - 70        | 40 - 45 - 50                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |
| 45 - 53 - 60        | 20 - 30 - 40                  | -              |
| 40 - 45 - 50        | 20 - 30 - 40                  | -              |
| -                   | -                             | -              |
| -                   | -                             | -              |

# THREAD TERMINOLOGY

## TERMINOLOGIA RELATIVA ALLA FILETTATURA

## TERMINOLOGIE



**A** External thread

Thread forming the outer surface of a cylinder.

**B** Internal thread

Thread forming the inner surface of a cylinder or taper.

**C** Crest

**D** Root

**E** Pitch

Pitch is the distance between two adjacent parallel thread flanks. With a screw or bolt of  $N$  starts, the pitch  $P=L/N$  (if  $N=1$ , the pitch=helix)

**F** Thread depth

The vertical distance between the thread crest and thread root.

**G** Minor diameter

Diameter of an imaginary cylinder located coaxially to the thread and where any surface line touches the root of the external thread or the crests of the internal thread.

**H** Pitch diameter

Diameter of an imaginary cylinder located coaxially to the thread and where any surface line intersects the thread profile so that the sections formed by the thread groove and the thread tooth are equal.

**I** Major diameter

Diameter of an imaginary cylinder located coaxially to the thread and where any surface line touches the crests of the external thread or the root of the internal thread.

**J** Helix angle

Angle formed by the tangential at the helical curve at a point located on the flank diameter of the thread by a plane perpendicular to the thread axis.

**K** Flank angle

**Nominal diameter**

Diameter to derive the diameter limits by applying deviation allowances and tolerances.

**Cylindrical thread**

Machined on a cylinder.

**Tapered thread**

Machined on a taper.

**A** Filettatura esterna

Filettatura che viene realizzata sulla superficie esterna di un cilindro.

**B** Filettatura interna

Filettatura che viene prodotta sulla superficie interna di un cilindro o di un cono.

**C** Cresta del filetto**D** Base del filetto**E** Passo

Il passo indica la distanza tra due fianchi del filetto direttamente vicini nella stessa direzione. In una vite con filettature  $N$  per il passo si applica la seguente formula  $P=L/N$  (se  $N=1$  il modulo è = al passo)

**F** Profondità del filetto

La distanza perpendicolare all'asse tra la cresta del filetto e la base del filetto.

**G** Diametro di nocciolo

Diametro del cilindro immaginario, coassiale al filetto, in cui ogni eventuale generatrice tocca la base del filetto della filettatura esterna o la cresta del filetto della filettatura interna.

**H** Diametro di passo

Diametro del cilindro immaginario coassiale al filetto in cui ogni eventuale generatrice taglia il profilo di filettatura tanto che le sezioni formate da scanalatura del filetto e dente del filetto sono uguali.

**I** Diametro esterno

Diametro del cilindro immaginario coassiale al filetto in cui ogni eventuale generatrice tocca le creste del filetto della filettatura esterna o la base del filetto della filettatura interna.

**J** Angolo dell'elica

Angolo che viene formato dalla tangente all'elica in un punto del filetto sul diametro medio e da un piano perpendicolare all'asse filettato.

**K** Angolo del profilo del filetto**Diametro nominale**

Il diametro da cui derivano i limiti del diametro applicando le aggiunte dovute agli scostamenti e le tolleranze degli scostamenti.

**Filettatura cilindrica**

Realizzata su un cilindro.

**Filettatura conica**

Realizzata su un cono.

**A** Filetage extérieur

Filetage formé sur la surface extérieure d'un cylindre.

**B** Filetage intérieur

Filetage formé sur la surface intérieure d'un cylindre ou d'un cône.

**C** Pointe du filet**D** Fond du filet**E** Pas

Le pas désigne la distance entre deux flancs de filets adjacents et orientés dans le même sens. Pour une vis à filets  $N$ ,  $P=L/N$  s'applique pour le pas (pour  $N=1$  le pas = pas de vis)

**F** Profondeur de filetage

La distance perpendiculaire à l'axe entre la pointe et le fond du filet.

**G** Diamètre central

Diamètre du cylindre imaginaire qui est agencé de manière coaxiale par rapport au filetage et avec lequel n'importe quelle génératrice a contact avec le fond du filetage extérieur ou les pointes du filetage intérieur.

**H** Diamètre primitif

Diamètre du cylindre imaginaire qui est agencé de manière coaxiale par rapport au filetage et avec lequel n'importe quelle génératrice coupe le profil fileté de façon à ce que les sections formées par la rainure et la dent de filetage soient identiques.

**I** Diamètre extérieur

Diamètre du cylindre imaginaire qui est agencé de manière coaxiale par rapport au filetage et avec lequel n'importe quelle génératrice a contact avec les pointes du filetage extérieur ou le fond du filetage intérieur.

**J** Angle d'hélice

Angle formé par la tangente à l'hélice à un point situé sur le diamètre du flanc de filetage et par un plan perpendiculaire à l'axe de filetage.

**K** Angle de flanc**Diamètre nominal**

Le diamètre à partir duquel les limites du diamètre sont calculées en appliquant les compléments et tolérances d'écart.

**Filetage cylindrique**

Formé sur un cylindre.

**Filetage conique**

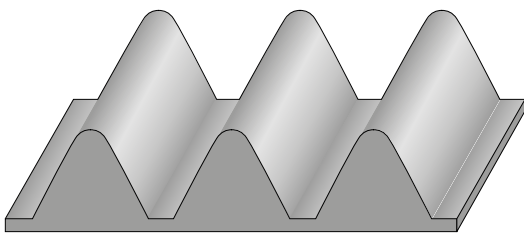
Formé sur un cône.



## THREAD DIRECTION

### DIREZIONE DELLA FILETTATURA

### SENS DE FILETAGE



#### Left-hand thread

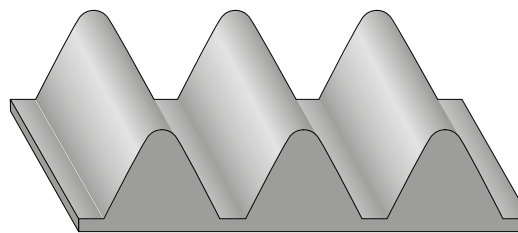
Thread that, viewed in the axial direction, rotates anti-clockwise and runs in the axial direction (LH).

#### Filettatura sinistrorsa

Filettatura che, vista in direzione assiale, si avvolge in senso antiorario e si sviluppa in direzione assiale (LH).

#### Filetage à gauche

Filetage qui s'enroule dans le sens anti-horaire dans le sens axial et qui s'étend dans le sens axial (LH).



#### Right-hand thread

Thread that, viewed in the axial direction, rotates clockwise and runs in the axial direction.

#### Filettatura destrorsa

Filettatura che, vista in direzione assiale, si avvolge in senso orario e si sviluppa in direzione assiale.

#### Filetage à droite

Filetage qui s'enroule dans le sens horaire dans le sens axial et qui s'étend dans le sens axial.

## HELIX ANGLE $\beta$ / ANGLE D'HÉLICE $\beta$ / ANGOLO DELL'ELICA $\beta$

### Helix / passo / Hélice

The helix is the path that a female thread runs on a bolt thread at a 360° rotation in axial direction.

Il passo indica il percorso che una filettatura interna percorre su un filetto maschio con una rotazione di 360° in direzione assiale.

L'inclinaison correspond à la distance parcourue par un filetage femelle sur un filetage mâle à une rotation de 360° dans le sens axial.

**Helix L = pitch P x number of starts N (if N=1, P=L)**

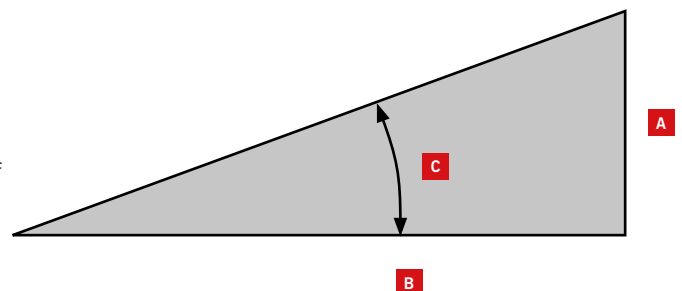
Passo L = passo P x numero delle passate N (con N=1 P=L)

Hélice L = pas P x nombre de filets N (pour N=1, P=L)

**A** Helix / passo / Inclinaison

**B**  $\pi$  x pitch diameter /  $\pi$  x diametro di passo /  $\pi$  x Diamètre primitif

**C** Helix angle / Angolo dell'elica / Angle d'hélice

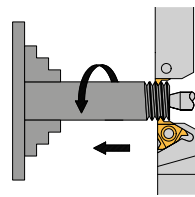


# SELECTING THE MACHINING METHOD

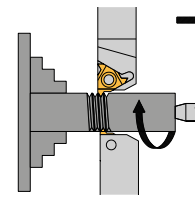
## CHOIX DE LA MÉTHODE D'USINAGE

### SCelta DEL METODO DI LAVORAZIONE

**External right-hand thread**  
*Filettatura destrorsa esterna*  
Filetage à droite extérieur

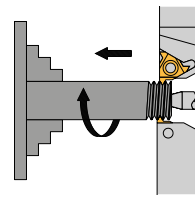


**Holders and inserts in right-hand version**  
*Supporti e Inserti in esecuzione destra*  
Supports et plaquettes de coupe amovibles à droite

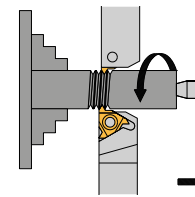


**Holders and inserts in left-hand version. CAUTION: Negative helix angle.**  
*Supporti e Inserti in esecuzione sinistra. ATTENZIONE: Angolo dell'elica negativo!*  
Supports et plaquettes de coupe amovibles à gauche. ATTENTION : angle d'hélice négatif !

**External left-hand thread**  
*Filettatura sinistrorsa esterna*  
Filetage à gauche extérieur

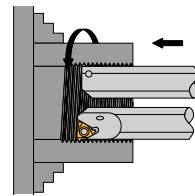


**Holders and inserts in left-hand version**  
*Supporti e Inserti in esecuzione sinistra*  
Supports et plaquettes de coupe amovibles à gauche

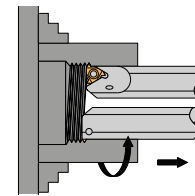


**Holders and inserts in right-hand version. CAUTION: Negative helix angle.**  
*Supporti e Inserti in esecuzione destra. ATTENZIONE: Angolo dell'elica negativo!*  
Supports et plaquettes de coupe amovibles à droite. ATTENTION : angle d'hélice négatif !

**Internal right-hand thread**  
*Filettatura destrorsa interna*  
Filetage à droite intérieur

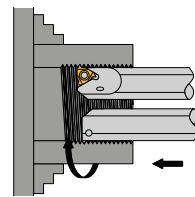


**Holders and inserts in right-hand version**  
*Supporti e Inserti in esecuzione destra*  
Supports et plaquettes de coupe amovibles à droite

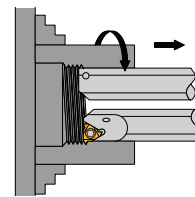


**Holders and inserts in left-hand version. CAUTION: Negative helix angle.**  
*Supporti e Inserti in esecuzione sinistra. ATTENZIONE: Angolo dell'elica negativo!*  
Supports et plaquettes de coupe amovibles à gauche. ATTENTION : angle d'hélice négatif !

**Internal left-hand thread**  
*Filettatura sinistrorsa interna*  
Filetage à gauche intérieur

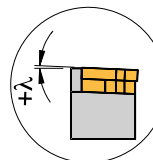


**Holders and inserts in left-hand version**  
*Supporti e Inserti in esecuzione sinistra*  
Supports et plaquettes de coupe amovibles à gauche

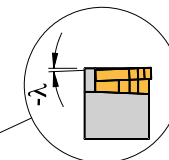
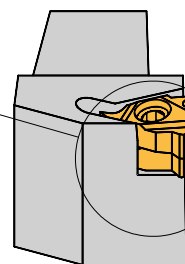


**Holders and inserts in right-hand version. CAUTION: Negative helix angle.**  
*Supporti e Inserti in esecuzione destra. ATTENZIONE: Angolo dell'elica negativo!*  
Supports et plaquettes de coupe amovibles à droite. ATTENTION : angle d'hélice négatif !

**Selecting the cutting direction**  
*Scelta della direzione di taglio*  
Choix du sens de coupe



**Feed direction towards chuck**  
*Avanzamento in direzione del mandrino*  
Avance dans le sens du mandrin



**Feed direction towards crest**  
*Avanzamento in direzione della punta*  
Avance dans le sens de la pointe

## MACHINING A MULTI-START THREAD

### LAVORAZIONE DI UN FILETTO MULTIPLIO

### USINAGE D'UN FILETAGE À PAS MULTIPLES

A thread whose helix  $L$  corresponds to a multiple integer of the pitch  $P$ . A multi-start thread permits a higher feed rate with a larger thread shape.

**A** Pitch

**B** Helix

Filetto il cui passo  $L$  corrisponde ad un multiplo intero del passo  $P$ . Un filetto multiplo consente un avanzamento più elevato o una forma del filetto più grande.

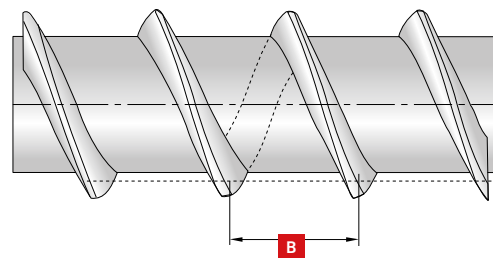
**A** Passo

**B** Passo

Un filetage dont l'hélice  $L$  correspond à un multiple entier du pas  $P$ . Un filetage à pas multiples permet d'obtenir une avance plus élevée sans augmenter la forme du filetage.

**A** Pas

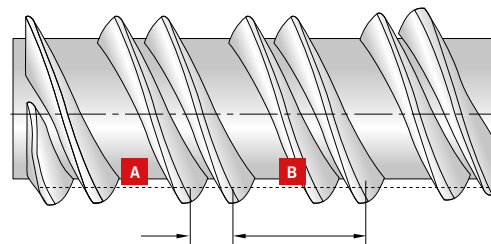
**B** Inclinaison



#### Machining the first start

Lavorazione primo avvio

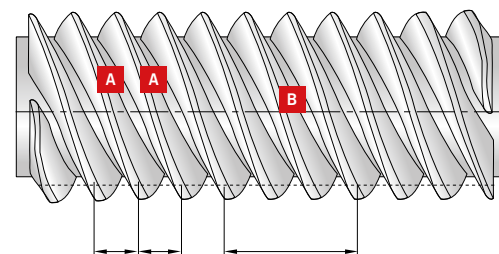
Premier passage d'usinage



#### Machining the second start

Lavorazione secondo avvio

Deuxième passage d'usinage



#### Third machined pass (end, three-start thread)

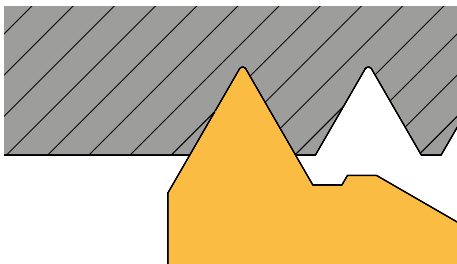
Terza passata lavorata (fine, filettatura a tre passate)

Troisième passage d'usinage (fin, filetage à trois filets)

# THREAD TURNING – INDEXABLE INSERTS

## FILETTATURA – INSERTI

## FILETAGE – PLAQUETTES DE COUPE AMOVIBLES



### Partial profile

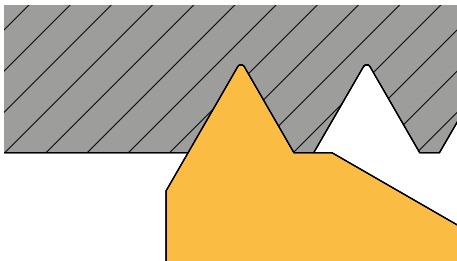
- Pre-turning external or internal diameter to precise dimensions since the tooth crest is not machined.
- An indexable insert for several helices at the same profile angle. This reduces stock volume.

### Profilo parziale

- Pretornitura del diametro esterno e interno alla misura esatta, poiché le punte dei denti non vengono lavorate.
- Un inserto per passi diversi con lo stesso angolo del profilo. In questo modo si riducono i costi di magazzino.

### Profil partiel

- Dégrossissage du diamètre extérieur ou intérieur aux dimensions exactes, car les pointes des dents ne peuvent pas être usinées.
- Une plaquette de coupe amovible pour plusieurs inclinaisons à angle profilé identique. Besoin de stockage réduit.



### Full profile

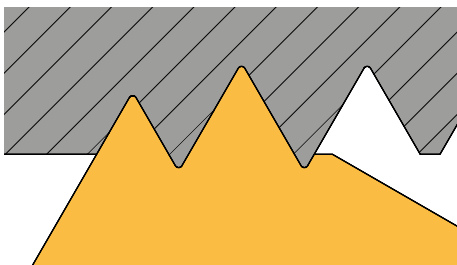
- The entire thread profile is machined including the tooth height.
- No burrs and high profile accuracy.
- A different indexable insert is required for each helix and profile.

### Profilo pieno

- Il profilo della filettatura completo, inclusa l'altezza del dente, viene lavorato
- Filettatura senza bavature con elevata precisione del profilo.
- Ogni passo e ogni profilo richiedono un inserto separato.

### Profil complet

- Tout le profil de filetage, y compris la hauteur des dents, est usiné.
- Filetage sans bavure avec précision de profil élevée.
- Chaque inclinaison et chaque profil requiert une plaquette de coupe amovible distincte.



### Multiple tooth profile

- For two or more teeth, otherwise similar to full profile indexable insert.
- Fewer passes, longer tool life and therefore higher productivity.
- Larger undercut and stable machining conditions are required.

### Profilo multidente

- Simile all'inserto per profilo pieno, tuttavia è dotato di uno o più denti.
- Numero inferiore di passate durate più elevate e quindi produttività più elevata.
- Sono necessari uno scarico dell'utensile più grande e condizioni di lavorazione stabili.

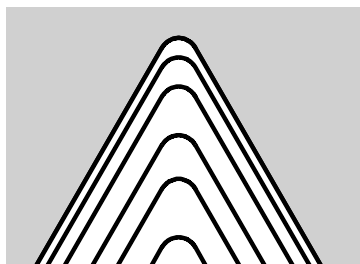
### Profil à dents multiples

- Semblable à la plaquette de coupe amovible pour profil complet, mais avec deux ou plusieurs dents.
- Moins de passages, durée de vie plus élevée et ainsi, plus grande productivité.
- Plus grand dégagement de l'outil et conditions d'usinage stables nécessaires.

## THREAD TURNING – INFEED TYPES

### FILETTATURA - TIPI DI AVANZAMENTO

### FILETAGE – TYPES DE DISPOSITIONS



#### Radial infeed

The simplest and most common infeed type perpendicular to the rotation axis. Machining takes place on both tool flanks, ensuring uniform wear.

Recommended for small helices up to approx. 2 mm. Preferred method for short-chipping materials and work hardened and stainless steels.

#### Avanzamento radiale

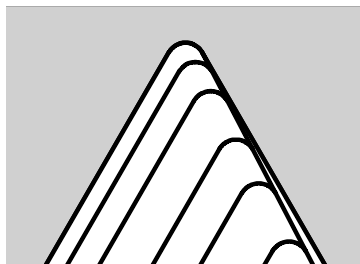
Avanzamento semplice e più usato, verticale rispetto all'asse di rotazione. La lavorazione avviene su entrambi i fianchi, in questo modo si garantisce un'usura equilibrata.

Consigliati con passi di piccole dimensioni fino a ca. 2 mm. Preferito per materiali a truciolo corto, acciai con tendenza all'incrudimento e acciai inossidabili.

#### Disposition radiale

Disposition simple et la plus courante perpendiculaire à l'axe de rotation. L'usinage se fait sur les deux flancs des dents, garantissant ainsi une usure uniforme.

Recommandée pour les petites inclinaisons jusqu'à env. 2 mm. Privilégiée pour les matériaux à copeaux courts et pour les aciers enclins à l'écaillage et inoxydables.



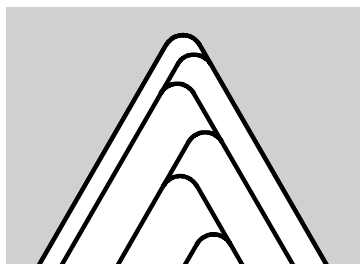
#### Full profile

Infeed at an angle of 3°–5° to the thread flank. Mainly used for NC machines. Good chip control, so especially suited for internal threads and long chipping materials. For helices over 2 mm.

Profilo *pi* Avanzamento inferiore ad un angolo di 3°–5° gradi rispetto al fianco della filettatura. Preferito per le macchine a CN. Buon controllo del truciolo, quindi particolarmente adatto per filettatura interna e materiali a truciolo lungo. Per passi maggiori, a partire da 2 mm.

#### Profil complet

Disposition sous un angle de 3 à 5° par rapport au flanc du filetage. Privilégié pour les machines NC. Bon contrôle des copeaux, par conséquent, convient particulièrement pour les filetages intérieurs et les matériaux à copeaux longs. Pour les hélices plus grandes à partir de 2 mm.



#### Multiple tooth profile

Alternating infeed along both flanks. Long tool life due to uniform flank wear on both flutes. Especially for large helices greater than 4 mm on NC machines with special programming.

#### Profilo multidento

Avanzamento alternato lungo entrambi i fianchi. Durate elevate grazie all'usura equilibrata dei fianchi su entrambi i taglienti. Soprattutto per passi grandi, a partire da 4 mm, su macchine a CN con programmazione speciale.

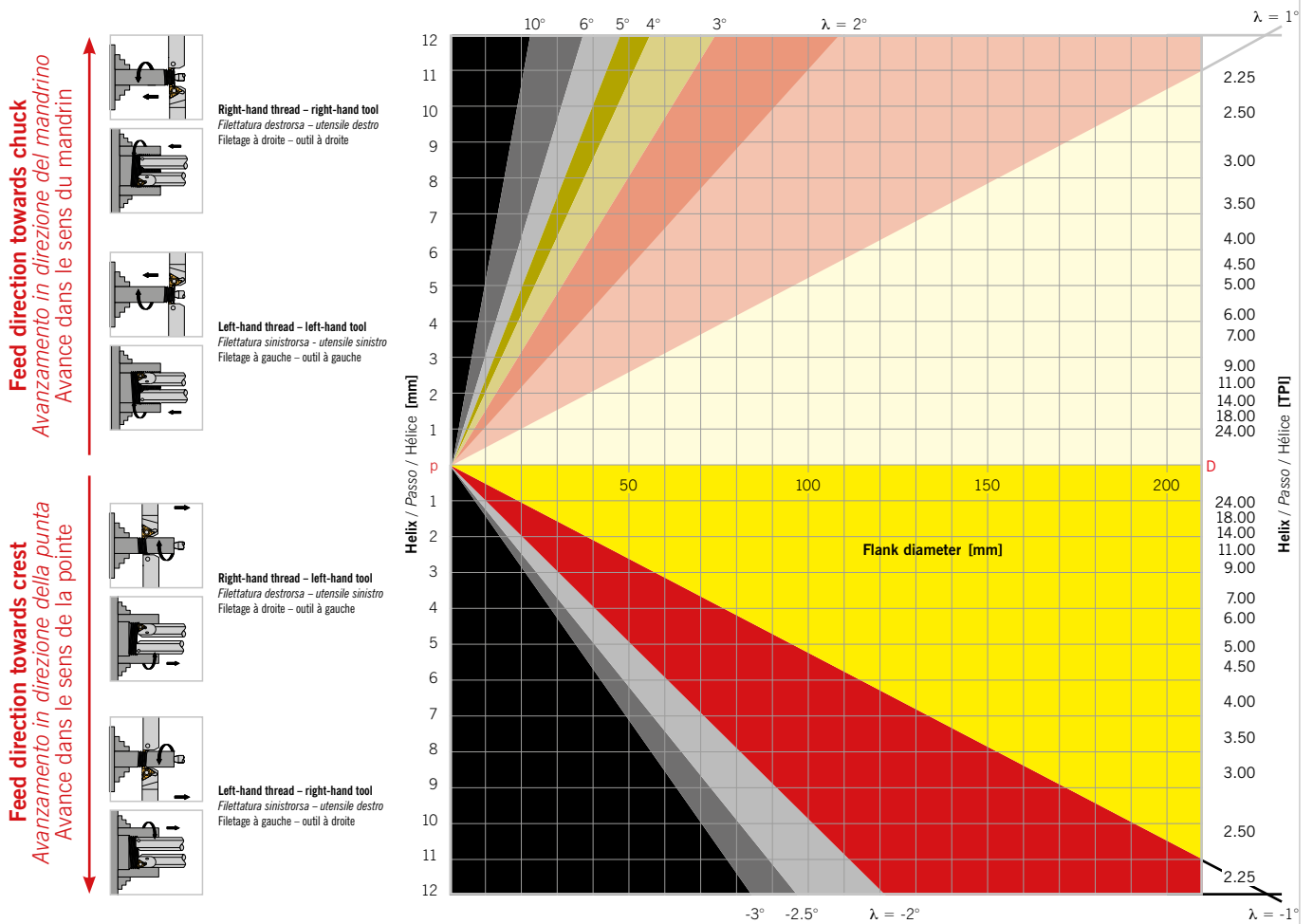
#### Profil à dents multiples

Disposition alternante le long des deux flancs. Longue durée de vie grâce à une usure uniforme des flancs sur les deux bords tranchants. Convient particulièrement pour les grandes hélices à partir de 4 mm sur des machines NC à programmation spéciale.

# TABLE OF HELIX ANGLES

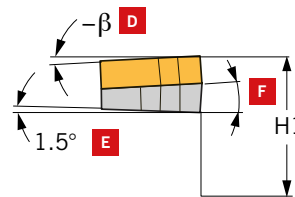
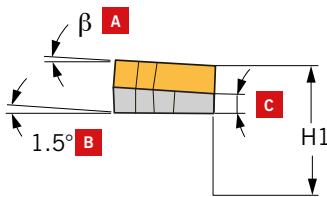
## DIAGRAMMA ANGOLO DELL'ELICA

## DIGRAMME D'ANGLE D'HÉLICE



Feed direction towards chuck / Avanzamento in direzione del mandrino / Avance dans le sens du mandrin

Feed direction towards crest / Avanzamento in direzione della punta / Avance dans le sens de la pointe



- A** Standard helix angle / Angolo dell'elica standard / Angle d'hélice standard
- B** Standard tool holder helix angle / Adattatore standard, Angolo dell'elica / Angle d'hélice porte-outil standard
- C** Support pad angle / Angolo supporto / Angle cale-support

- D** Inverted helix angle / Angolo dell'elica inverso / Angle d'hélice inversé
- E** Insert seat angle of standard tool holder / Angolo sede inserto del portainseriti / Angle du logement de plaquette du support de serrage standard
- F** Support pad angle / Angolo supporto / Angle cale-support

The dimensions H1 (flute height) remain constant for every flute/support pad combination.

Le dimensioni H1 (altezza tagliente) restano costanti per ogni combinazione di tagliente / supporto

Les dimensions H1 (hauteur des dents) restent constantes pour chaque combinaison dent/cale-support.

# SUPPORT PADS FOR TOOL HOLDERS

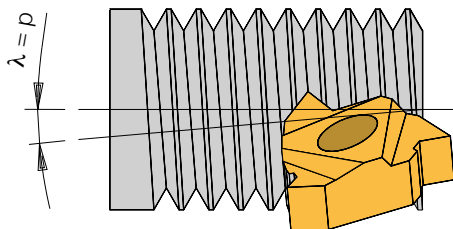
## SUPPORTI PER PORTAINSERTI

### CALES-SUPPORTS POUR SUPPORTS DE SERRAGE

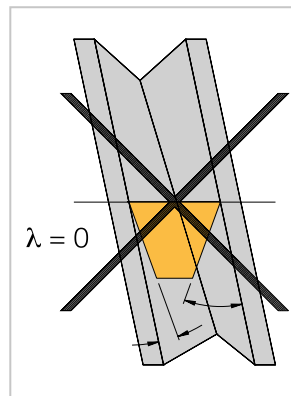
The flank clearance angles of the thread profile depend on the helix angle. The helix angle of the thread must match the inclination angle of the indexable insert as far as possible. This achieves the greatest profile accuracy, avoids uneven flank wear on the indexable insert and ensures longer tool life.

*Gli angoli di spoglia inferiore del profilo della filettatura dell'inserto dipendono dall'angolo di inclinazione della filettatura. L'angolo di inclinazione della filettatura deve coincidere il più possibile con l'angolo di inclinazione dell'inserto. In questo modo si ottiene la massima precisione del profilo, si evita l'usura irregolare delle superfici di spoglia dell'inserto e si garantisce una maggiore durata.*

Les angles de dépouille des flancs du profil fileté de la plaquette de coupe amovible dépendant de l'angle de montée du filetage. L'angle de montée du filetage doit correspondre le plus possible à l'angle d'inclinaison de la plaquette de coupe amovible. On obtient ainsi une précision de profil maximale tout en évitant une usure non régulière de la surface libre de la plaquette de coupe amovible, ce qui garantit une plus longue durée de vie.

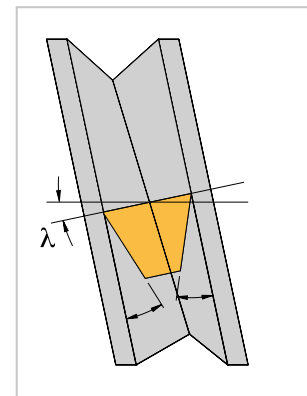


Incorrect



Rake angle and clearance angle are unequal if the inclination angle is  $\lambda = 0^\circ$ .  
*Angolo di spoglia superiore e angolo di spoglia inferiore sono diversi se l'angolo di inclinazione è  $\lambda = 0^\circ$ .  
L'angle de coupe et l'angle de dépouille ne sont pas identiques lorsque l'angle d'inclinaison  $\lambda = 0^\circ$ .*

Correct



Rake and clearance angle are equal if the inclination angle ( $\lambda$ ) and the helix angle ( $\phi$ ) are identical.  
*Angolo di spoglia superiore e angolo di spoglia inferiore sono identici, se l'angolo di inclinazione ( $\lambda$ ) e l'angolo dell'elica ( $\phi$ ) sono identici.  
L'angle de coupe et l'angle de dépouille sont identiques lorsque l'angle d'inclinaison ( $\lambda$ ) l'angle d'hélice ( $\phi$ ) sont les mêmes.*

The helix angle of the thread and the required inclination angle result from the following equation:

*L'angolo dell'elica della filettatura o l'angolo di inclinazione necessario si ricavano dalla seguente formula:*

L'angle d'hélice du filetage ou l'angle d'inclinaison nécessaire se calcule avec la formule suivante :

$$\tan \lambda = \frac{p}{d_2 \times \pi}$$

$\lambda_2$  = inclination angle / Angolo di inclinazione / angle d'inclinaison  
 $d_2$  = flank diameter / Diametro medio / diamètre du flanc  
 $p$  = helix / Passo / hélice

Tool holders are designed with an inclination angle of  $\lambda = 1.5^\circ$ . Support pads already fitted and supplied with the tool holder are ground plane-parallel at  $0^\circ$ . If the helix angle deviates by more than  $1^\circ$ , a different support pad should be selected. The tip height of the indexable insert always remains the same (irrespective of the support pad selected).

*I portainseriti sono realizzati con un angolo di inclinazione di  $\lambda = 1,5^\circ$ . I supporti già montati nei portainseriti e compresi nella fornitura sono rettificati in piano a  $0^\circ$ . In caso di scostamenti dell'angolo di inclinazione di oltre  $1^\circ$  si dovrebbe scegliere un supporto diverso. L'altezza delle punte dell'inserto rimane sempre uguale (indipendentemente dal supporto scelto).*

Les supports de serrage sont conçus avec un angle d'inclinaison de  $\lambda = 1,5^\circ$ . Les cales-supports déjà montées sur le support de serrage et fournies à la livraison sont rectifiées en parallèle à  $0^\circ$ .

En cas d'écart de l'angle de montée supérieurs à  $1^\circ$ , une autre cale-support doit être choisie. La hauteur de pointe de la plaquette de coupe amovible reste toujours la même (indépendamment du choix de la cale-support).

# SUPPORT PADS

## ROSETTE

### CALES-SUPPORTS

| External thread<br><i>Filettatura esterna</i><br>Filetage extérieur        | Tool holder<br><i>Portainseriti</i><br>Support de serrage | Helix angle / <i>Angolo dell'elica</i> / Angle d'hélice |          |          |       |           |            |          |          |
|--|---|---|----------|----------|-------|-----------|------------|----------|----------|
|  |   | 4.5°  | 3.5°     | 2.5°     | 1.5°  | 0.5°      | 0°         | -0.5°    | -1.5°    |
| 16   | R   | YE 3-3P   | YE 3-2P  | YE 3-1P  | YE 3  | YE 3-1 N  | YE 3-1.5N  | YE 3-2N  | YE 3-3N  |
|  | L   | YI 3-3P   | YI 3-2P  | YI 3-1P  | YI 3  | YI 3-1 N  | YI 3-1.5N  | YI 3-2N  | YI 3-3N  |
| 22   | R   | YE 4-3P   | YE 4-2P  | YE 4-1P  | YE 4  | YE 4-1 N  | YE 4-1.5N  | YE 4-2N  | YE 4-3N  |
|  | L   | YI 4-3P   | YI 4-2P  | YI 4-1P  | YI 4  | YI 4-1 N  | YI 4-1.5N  | YI 4-2N  | YI 4-3N  |
| 22 U   | R   | YE 4U-3P  | YE 4U-2P | YE 4U-1P | YE 4U | YE 4U-1 N | YE 4U-1.5N | YE 4U-2N | YE 4U-3N |
|  | L   | YI 4U-3P  | YI 4U-2P | YI 4U-1P | YI 4U | YI 4U-1 N | YI 4U-1.5N | YI 4U-2N | YI 4U-3N |
| 27   | R   | YE 5-3P   | YE 5-2P  | YE 5-1P  | YE 5  | YE 5-1 N  | YE 5-1.5N  | YE 5-2N  | YE 5-3N  |
|  | L   | YI 5-3P   | YI 5-2P  | YI 5-1P  | YI 5  | YI 5-1 N  | YI 5-1.5N  | YI 5-2N  | YI 5-3N  |
| 27U  | R   | YE 5U-3P  | YE 5U-2P | YE 5U-1P | YE 5U | YE 5U-1 N | YE 5U-1.5N | YE 5U-2N | YE 5U-3N |
|  | L   | YI 5U-3P  | YI 5U-2P | YI 5U-1P | YI 5U | YI 5U-1 N | YI 5U-1.5N | YI 5U-2N | YI 5U-3N |
| <b>Internal thread</b><br><i>Filettatura interna</i><br>Filetage intérieur |   |   |          |          |       |           |            |          |          |
| 16   | R   | YI 3-3P   | YI 3-2P  | YI 3-1P  | YI 3  | YI 3-1 N  | YI 3-1.5N  | YI 3-2N  | YI 3-3N  |
|  | L   | YE 3-3P   | YE 3-2P  | YE 3-1P  | YE 3  | YE 3-1 N  | YE 3-1.5N  | YE 3-2N  | YE 3-3N  |
| 22   | R   | YI 4-3P   | YI 4-2P  | YI 4-1P  | YI 4  | YI 4-1 N  | YI 4-1.5N  | YI 4-2N  | YI 4-3N  |
|  | L   | YE 4-3P   | YE 4-2P  | YE 4-1P  | YE 4  | YE 4-1 N  | YE 4-1.5N  | YE 4-2N  | YE 4-3N  |
| 22 U   | R   | YI 4U-3P  | YI 4U-2P | YI 4U-1P | YI 4U | YI 4U-1 N | YI 4U-1.5N | YI 4U-2N | YI 4U-3N |
|  | L   | YE 4U-3P  | YE 4U-2P | YE 4U-1P | YE 4U | YE 4U-1 N | YE 4U-1.5N | YE 4U-2N | YE 4U-3N |
| 27   | R   | YI 5-3P   | YI 5-2P  | YI 5-1P  | YI 5  | YI 5-1 N  | YI 5-1.5N  | YI 5-2N  | YI 5-3N  |
|  | L   | YE 5-3P   | YE 5-2P  | YE 5-1P  | YE 5  | YE 5-1 N  | YE 5-1.5N  | YE 5-2N  | YE 5-3N  |
| 27 U   | R   | YI 5U-3P  | YI 5U-2P | YI 5U-1P | YI 5U | YI 5U-1 N | YI 5U-1.5N | YI 5U-2N | YI 5U-3N |



# NUMBER OF PASSES

## NUMERO DELLE PASSATE

## NOMBRE DE PASSAGES

| Helix / Passo / Hélice                                       |     |      |     |      |      |      |      |      |      |       |       |       |       |       |       |       |
|--|-----|------|-----|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| [mm]   | 0.5 | 0.75 | 1.0 | 1.25 | 1.5  | 1.75 | 2.0  | 2.5  | 3.0  | 3.5   | 4.0   | 4.5   | 5.0   | 5.5   | 6.0   | 8.0   |
| [Start /inch]  | 48  | 32   | 24  | 20   | 16   | 14   | 12   | 10   | 8    | 7     | 6     | 6     | 5     | 5     | 4     | 3     |
| Number of passes / Numero delle passate / Nombre de passages |     |      |     |      |      |      |      |      |      |       |       |       |       |       |       |       |
|  | 4-6 | 4-7  | 4-8 | 5-9  | 6-10 | 7-12 | 7-12 | 8-14 | 9-16 | 10-18 | 11-18 | 11-19 | 12-20 | 12-20 | 12-20 | 15-24 |

The values listed here are general recommendations for the number of passes for machining normal steel and non-ferrous metal materials. With hard materials, the cutting depth should be reduced and the number of cuts increased.

**NOTE:** The chip cross-section should be of identical size for each pass. This means that, as cutting depth increases, reduce the infeed to maintain constant cutting forces.

If the insert ruptures, increase the number of passes. If the insert is subject to high wear, reduce the number of passes. The infeed should be at least 0.05 mm and not below 0.08 mm for stainless steel.

*I valori qui indicati sono raccomandazioni generali per il numero delle passate durante la lavorazione di normali materiali in acciaio o metalli non ferrosi. Per i materiali duri si deve ridurre la profondità di taglio e aumentare il numero dei tagli.*

*NOTA: La sezione dei trucioli dovrebbe avere la stessa dimensione ad ogni passata, ciò significa che con l'aumentare della profondità del taglio si deve ridurre l'avanzamento per ottenere forze di taglio costanti.*

*In caso di rottura dell'inserto il numero dei passaggi va aumentato, in presenza di usura elevata va ridotto. L'avanzamento dovrebbe essere almeno di 0,05 mm e per l'acciaio inossidabile non dovrebbe essere inferiore a 0,08 mm.*

Les valeurs indiquées ici sont des recommandations générales pour le nombre de passages pour l'usinage de matériaux en acier et non ferreux normaux. Pour les matériaux durs, il convient de réduire la profondeur de coupe et d'augmenter le nombre de coupes.

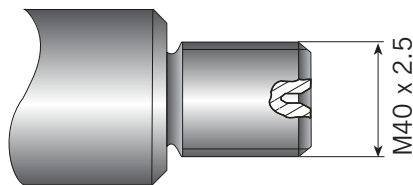
REMARQUE : la section de copeaux doit être de la même taille à chaque passage, c'est-à-dire que la disposition doit être réduite à profondeur de coupe croissante afin d'obtenir des pressions de coupe constantes.

En cas de rupture de plaquette, le nombre de passages doit être augmenté. Il doit être réduit en cas de forte usure. La disposition doit être au minimum de 0,05 mm et ne pas être inférieure à 0,08 mm avec de l'acier inoxydable.

# THREAD TURNING - A STEP BY STEP GUIDE - EXAMPLE 1

## FILETTATURA PASSO PER PASSO - ESEMPIO 1

## FILETAGE PAS À PAS – EXEMPLE 1



### Application

**Thread: External right-hand thread ISO metric M40x2.5**

**Material: 4140 (25 HRc)**

### Applicazione da realizzare

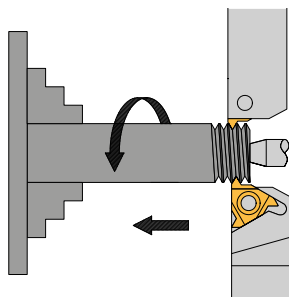
*Filettatura: Lato esterno destro ISO metrica M40x2.5*

*Materiale: 4140 (25 HRc)*

### Application d'usinage

Filetage : extérieur côté droit ISO métrique M40x2.5

Matériau : 4140 (25 HRc)



### Step 1: Selecting the thread execution method

Select feed direction towards chuck.

Here, use a right-hand flute External and a right-hand holder External.

### Passo 1: Scelta del metodo di filettatura

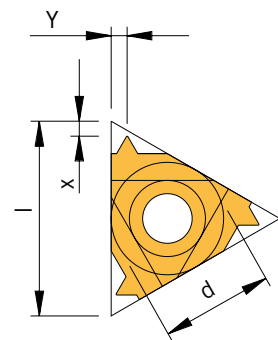
*Scegliere l'avanzamento in direzione del mandrino di serraggio.*

*In questo caso utilizzare un inserto destro esterno e un supporto destro esterno.*

### Étape 1 : choix de la méthode de filetage

Choisissez l'avance dans le sens du mandrin de serrage.

Utiliser ici une plaquette de coupe extérieure droite et un support extérieur droit.



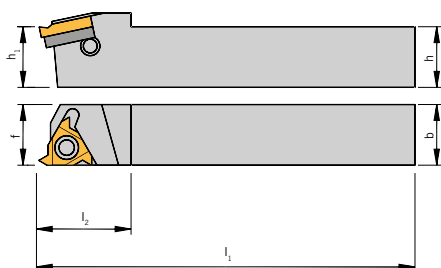
### Step 2: Selecting the insert size

**Indexable insert selected: / Inserto selezionato: / Plaquette choisie : 16ER-V-ISO2,50 AL100**

### Passo 2: Selezione della misura dell'inserto.

### Étape 2 : choix des dimensions des plaquettes de coupe

|  |          |          |
|--|----------|----------|
| <b>Indexable insert size (mm) / Dimensione inserto (mm) / Dimensions des plaquettes (mm)</b> | <b>d</b> | 9,525    |
|  | <b>l</b> | 16       |
| <b>Pitch / Passo / Pas en</b>  |          | 2,50     |
| <b>Support pad / Supporto / Cale-support</b>   |          | YE3      |
| <b>Tool holder / Portautensili / Porte-outil</b>   |          | AL...-3R |



### Step 3: Selecting the tool holder

**Tool holder selected: / Portautensili selezionato: / Porte-outil choisie : AL25-3R**

### Passo 3: Selezione adattatore

### Étape 3 : choix du porte-outils

|  |                      |       |
|--|----------------------|-------|
| <b>Indexable insert size (mm) / Dimensione inserto (mm) / Dimensions des plaquettes (mm)</b> | <b>d</b>             | 9,525 |
|  | <b>h=h1=b</b>        | 25,0  |
|  | <b>f</b>             | 25,0  |
| <b>Dimensions (mm) / Dimensioni (mm) / Dimensions (mm)</b>                                   | <b>l<sub>1</sub></b> | 153,6 |
|  | <b>l<sub>2</sub></b> | 30,0  |

**Step 4: Helix angle from chart**

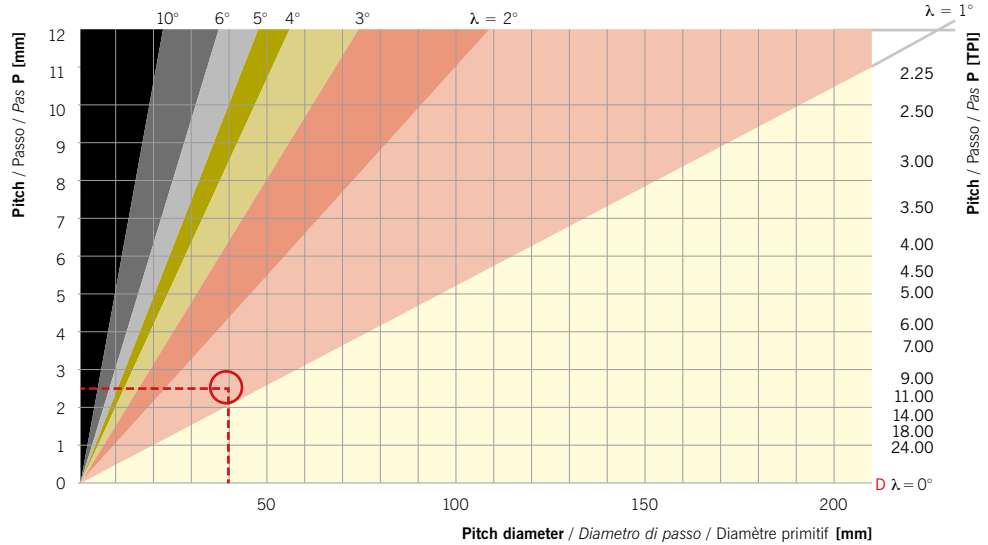
Select the helix angle of 1.5° from the chart if a distance of 2.5 mm (10 TPI) and a tool diameter of 40 mm (1.57") are used.

**Passo 4: Angolo dell'elica dal diagramma**

Desumere dalla tabella l'angolo dell'elica di 1,5° se si utilizza una distanza di 2,5 mm (10 TPI) e un diametro del pezzo in lavorazione di 40 mm (1,57").

**Étape 4 : angle d'hélice à partir du diagramme**

Reportez-vous au tableau pour l'angle d'hélice de 1,5° si vous appliquez une distance de 2,5 mm (10 TPI) et un diamètre de pièce à usiner de 40 mm (1,57").



**Step 5: Selecting the support pad**

Support pad selected: YE3 – resulting helix angle

**Passo 5: Scelta supporto:**

Supporto selezionato: YE3 – Angolo dell'elica risultante

**Étape 5 : choix de la cale-support**

Cale-support choisie : YE3 – angle d'hélice résultant

|  |          |            |
|--|----------|------------|
| <b>Indexable insert size / Dimensione inserto / Dimensions des plaquettes (mm)</b> | <b>d</b> | 9.525      |
|  | <b>l</b> | 16         |
| <b>Pitch / Passo / Pas</b>   |          | 2.50       |
| <b>Support pad / Supporto / Cale-support</b>                                       |          | <b>YE3</b> |
| <b>Tool holder / Portautensili / Porte-outils</b>                                  |          | AL25-3R    |

**Step 6: Selecting the carbide grade and cutting speed**

Carbide grade selected: AL100

Cutting speed: 140 m/min

**Passo 6: Selezione varietà metallo duro e velocità di taglio**

Varietà di metallo duro selezionata: AL100

Velocità di taglio: 140 m/min

**Étape 6 : choix du type de carbure et de la vitesse de coupe**

Type de carbure choisi : AL100

Vitesse de coupe : 140 m/min

| Material group<br>Gruppo materiale<br>Groupe de matériaux | Classification of main material groups and code letters<br>Suddivisione dei gruppi di materiali e lettere di riferimento<br>Classification des principaux groupes de matériaux et des lettres d'identification | Brinell hardness<br>Durezza Brinell<br>Dureté Brinell | Tensile strength (N/mm²)<br>Resistenza alla trazione (N/mm²)<br>Résistance à la traction (N/mm²) | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Cutting speed Vc (m/min)<br>Velocità di taglio Vc (m/min)<br>Vitesse de coupe Vc (m/min) |                  |
|---|--|---|--|---|--|------------------|
|   |  |   |  |   | HC   | AL100 (standard) |
| <b>P</b>  | <b>Low alloyed steel</b><br>Acciaio a bassa lega<br>Acier faiblement allié   | <b>annealed / ricotto / recuit</b>                    | 175  | 591   | P7   | 100 - 140 - 180  |
|   |  | <b>tempered / bonificato / traité thermiquement</b>   | 300  | 1013  | P8   | 75 - 108 - 140   |
|   |  | <b>tempered / bonificato / traité thermiquement</b>   | 380  | 1282  | P9   | 70 - 103 - 135   |
|   |  | <b>tempered / bonificato / traité thermiquement</b>   | 430  | 1477  | P10  | 70 - 103 - 135   |

**Step 7: Determining the number of passes**

Number of passes: 14

**Étape 7 : détermination du nombre de passages**

Nombre de passages : 14

**Passo 7: Determinazione del numero delle passate**

Numero delle passate 14

|   |            |      |      |      |             |      |       |       |
|---|------------|------|------|------|-------------|------|-------|-------|
| <b>Pitch</b><br>Passo<br>Pas  | <b>mm</b>  | 1.50 | 1.75 | 1.75 | <b>2.50</b> | 3.00 | 3.50  | 4.00  |
|   | <b>TPI</b> | 16   | 14   | 14   | 10          | 8    | 7     | 6     |
| <b>Number of passes</b><br>Numero delle passate<br>Nombre de passages |            | 6-10 | 7-12 | 7-12 | <b>8-14</b> | 9-16 | 10-18 | 11-18 |

**Summary**

Riepilogo

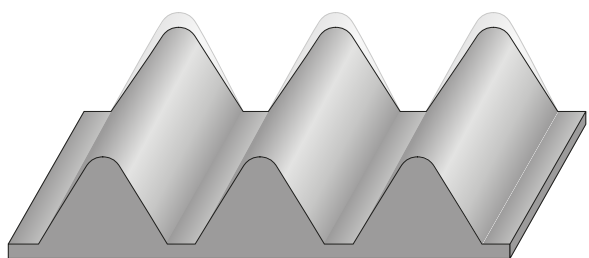
Récapitulatif

|  |  |
|--|--|
| <b>Thread type / Tipo di filettatura / Type de filetage</b>                            | ISO M40x2.5 right-hand External / destrorsa esterna / extérieur droit          |
| <b>Feed direction: / Direzione di avanzamento: / Direction d'avance :</b>              | Towards chuck / In direzione del mandrino / dans le sens du mandrin de serrage |
| <b>Indexable insert and coating / Inserto e rivestimento / Plaquette et revêtement</b> | 16ER-V-ISO2,50 AL100   |
| <b>Tool holder: / Portautensili: / Porte-outils :</b>                                  | AL25-3R  |
| <b>Helix angle: / Angolo dell'elica: / Angle d'hélice :</b>                            | 1.5°   |
| <b>Support pad: / Supporto: / Cale-support :</b>                                       | YE3  |
| <b>Cutting speed: / Velocità di taglio: / Vitesse de coupe :</b>                       | 140 m/min  |
| <b>Number of passes: / Numero delle passate / Nombre de passages :</b>                 | 14   |

# TROUBLESHOOTING

## ELIMINAZIONE DEGLI ERRORI

## RÉSOLUTION DES PROBLÈMES



### Thread profile too flat

The tool is not at tip height

-> **Adjust the tip height**

Indexable insert fails to machine the crest

-> **Measure the tool diameter**

Worn insert

-> **Replace the indexable insert earlier**

### Profilo filettatura troppo piatto

L'utensile non si trova all'altezza delle punte

-> **Modificare l'altezza delle punte**

L'inserto non lavora la punta della filettatura

-> **Misurare il diametro del pezzo in lavorazione**

Inserto consumato

-> **Cambiare prima l'inserto**

### Profil de filetage trop plat

L'outil n'est pas sur la hauteur de pointe

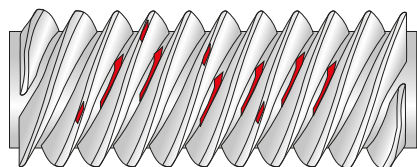
-> **Modifier la hauteur de pointe**

La plaquette de coupe amovible n'usine pas la pointe du filet

-> **Mesurez le diamètre de la pièce à usiner**

Plaquette de coupe usée

-> **Remplacez la plaquette de coupe amovible plus tôt**



### Low surface quality

Cutting speed too low

-> **Increase the cutting speed**

Incorrect support pad

-> **Select the correct support pad**

Unsuitable infeed method

-> **Use alternating or radial infeed**

### Ridotta finitura superficiale

Velocità di taglio troppo bassa

-> **Aumentare la velocità di taglio**

Supporto errato

-> **Scegliere il supporto corretto**

Metodo di avanzamento non idoneo

-> **Utilizzare l'avanzamento alternato o radiale**

### Finition de surface insatisfaisante

Vitesse de coupe trop faible

-> **Augmenter la vitesse de coupe**

Mauvaise cale-support

-> **Choisissez la bonne cale-support**

Méthode de disposition non appropriée

-> **Utilisez la disposition alternante ou radiale**

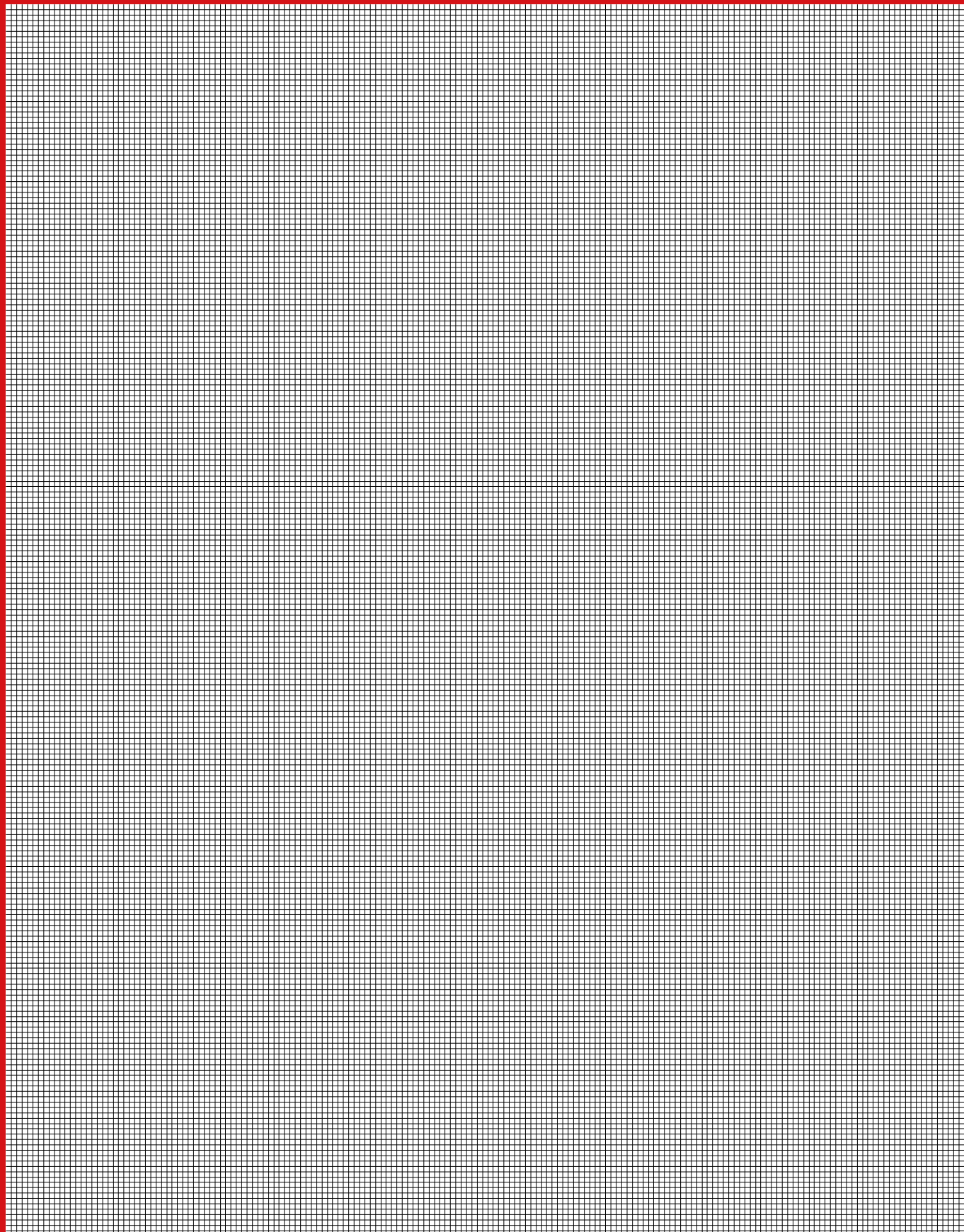
**For more information see**

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# TOOL MANAGEMENT

## Tool Management

### Automated tool management

- Overview 730 – 731
- ARNO® StoreManager<sup>DUO</sup> 732 – 735
- ARNO® StoreManager<sup>PRO</sup> 736 – 739
- ARNO® StoreManager<sup>START</sup> 740 – 743

### Gestione automatizzata degli utensili

- *Panoramica* 744 – 745
- ARNO® StoreManager<sup>DUO</sup> 746 – 749
- ARNO® StoreManager<sup>PRO</sup> 750 – 753
- ARNO® StoreManager<sup>START</sup> 754 – 757

### Système de gestion automatisée des outils

- Aperçu 758 – 759
- ARNO® StoreManager<sup>DUO</sup> 760 – 763
- ARNO® StoreManager<sup>PRO</sup> 764 – 767
- ARNO® StoreManager<sup>START</sup> 768 – 771



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# EVERYTHING SIMPLY HAS ITS PLACE.

## 2,160 compartments on 1.3 m<sup>2</sup>

It's incredible how much space there is in the StoreManager<sup>PRO</sup>.  
Choose between 4 compartment sizes with customisable configuration.

## Access time approx. 10 seconds

That's how long it takes before the operator has the required tool in their hands.

## Updates guaranteed for 5 years

You gain long-term benefits from our ARNO StoreManagers.  
You receive regular system updates for at least 5 years as part of our maintenance and support contract.

## Starting at 15 Euro per compartment

StoreManagers offer an excellent price-performance ratio.



At a glance  
[toolmanagement.arno.de](https://toolmanagement.arno.de)  
Take a look and find out!

## Smooth integration into your production

StoreManagers are easy to integrate into your existing process structures since they have interfaces to all common ERP and tool management systems. If you need other interfaces, we adapt the system for you – fast and at low cost.

## Guaranteed individual removal

Only the selected compartment opens – no other item can be taken out. This makes every removal traceable.

## Variable and modular

Cabinet configuration is customisable with 4 different compartment sizes. If some day there is no space left, you can expand the system with additional cabinets.

## 100% access control and cost transparency

Full control thanks to guaranteed individual removal.

## 24/7 availability

Practical, especially in multi-shift work: Employees have access at all times to the tools required.

## 0% deficit stock

Stock warnings when minimum levels are reached and the system generates automatic repeat orders or order proposals. This means no machine downtimes due to missing tools.

## Data import

We help you start off your new ARNO automated tool manager by importing existing tool data into the StoreManager system.





# STRONG COMBINATION.

**Twice as good: ARNO StoreManager<sup>DUO</sup> combines the advantages of a carousel and a drawer system.**

Ideal for small companies or production cells: StoreManager<sup>DUO</sup> is equipped with an upper section consisting of 360 individual compartments in a carousel system to store tools and small parts. The lower section has four drawers providing additional space for larger items. With the ARNO StoreManager<sup>DUO</sup> you have everything under control and in view: indexable inserts, drill bits, milling cutters, holders, measuring devices, special tools and much more.

Why not see for yourself and be impressed by the benefits of automated tool management – thanks to the ARNO rental scheme which comes with a 30-day trial period, no risk and no major investment. It brings the future to companies of any size.



At a glance  
[toolmanagement.arno.de](http://toolmanagement.arno.de)  
Take a look and find out!



## Master module



- Module with PC, monitor, RFID reader and barcode scanner
- 360 individually locked storage locations and 4 drawers (individually locked)

## Plus expansion module



- Every DUO Master module can be expanded by adding up to 2 DUO Plus modules
- Each module offers another 360 carousel storage locations and 4 drawers



## COMBINED ADVANTAGES

of the ARNO StoreManager<sup>DUO</sup>

Combined carousel and drawer cabinet –  
360 individual compartments and 4 drawers

Ideal for small companies or production cells

All the benefits, no risk – with the innovative ARNO  
rental scheme

Connection to ERP systems via CSV interface

## StoreManager<sup>DUO</sup> Facts and Figures

Available in fixed configuration with 360 compartments and 4 drawers.

Individual compartment 180x “large/straight”

Front width: 87 mm | Rear width: 68 mm  
Depth: 195 mm | Height: 53 mm

Individual compartment 180x  
“small/tapered”

Front width: 87 mm | Rear width: 6 mm  
Depth: 195 mm | Height: 53 mm

Drawer 2x height 100 mm

Inner dimensions (usable area): 612 x 612 mm

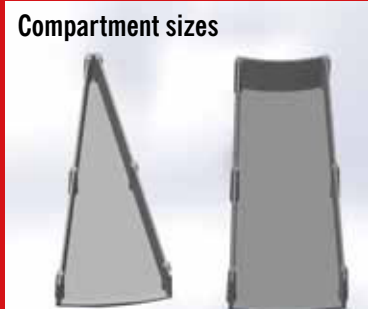
Drawer 2x height 200 mm

Inner dimensions (useful area): 612 x 612 mm



Carousel

15 levels each with 24 compartments



Compartment sizes

2 compartments with guaranteed single removal



Drawer

2 heights: 100 and 200 mm

# PRACTICAL: THE RENTAL CONCEPT FOR THE DUO.

Fit for the future: Entry into digital tool management is even easier with the rental scheme for the ARNO StoreManager<sup>DUO</sup>.



## NO-RISK BENEFITS

with the rental concept for the ARNO StoreManager<sup>DUO</sup>.

No service/maintenance/spare parts costs – the monthly rental covers it all

No-risk trial – you may return the device within the first 30 days after start-up (Subject to local agreement)

Low monthly rate which decreases as tool turnover rises – the rate is calculated and adapted based on the tool turnover (with ARNO) of the previous year

All basic functions are covered by the rental.  
This also applies to all software updates

Higher tool turnover, lower rental.  
**Our innovative rental scheme.**

### Master module

- Every DUO Master module can be expanded by adding up to 2 DUO Plus modules.



| Dimensions                           | StoreManager <sup>DUO</sup> Master |         |          | StoreManager <sup>DUO</sup> Plus |         |          |
|--------------------------------------|------------------------------------|---------|----------|----------------------------------|---------|----------|
| Width (without side monitor)         | 800 mm                             |         |          | 800 mm                           |         |          |
| Depth                                | 800 mm                             |         |          | 800 mm                           |         |          |
| Height                               | 1,828 mm                           |         |          | 1,828 mm                         |         |          |
| Footprint                            | 0.64 m <sup>2</sup>                |         |          | 0.64 m <sup>2</sup>              |         |          |
| Weight empty                         | approx. 250 kg                     |         |          | approx. 230 kg                   |         |          |
| <b>Carousel</b>                      |                                    |         |          |                                  |         |          |
| Number of compartments               | 360                                |         |          | 360                              |         |          |
| Large compartment (w x h x d)        | Front 87 mm                        | x 50 mm | x 195 mm | Front 87 mm                      | x 50 mm | x 195 mm |
|                                      | Rear 68 mm                         |         |          | Rear 68 mm                       |         |          |
| Small compartment (w x h x d)        | Front 87 mm                        | x 50 mm | x 195 mm | Front 87 mm                      | x 50 mm | x 195 mm |
|                                      | Rear 6 mm                          |         |          | Rear 6 mm                        |         |          |
| <b>Drawers</b>                       |                                    |         |          |                                  |         |          |
| Number of drawers 100 mm high        | 2                                  |         |          | 2                                |         |          |
| Number of drawers 200 mm high        | 2                                  |         |          | 2                                |         |          |
| <b>General</b>                       |                                    |         |          |                                  |         |          |
| Max. rotation speed                  | 2 rpm                              |         |          | 2 rpm                            |         |          |
| Max. access time                     | 15 seconds                         |         |          | 15 seconds                       |         |          |
| Power supply                         | 230 volts / 50 Hz                  |         |          | 230 volts / 50 Hz                |         |          |
| Operation                            | Touch screen, barcode scanner      |         |          | –                                |         |          |
| Network connection                   | LAN socket                         |         |          | –                                |         |          |
| Permissible temperature in operation | +10°C to +40°C                     |         |          | +10°C to +40°C                   |         |          |
| Permissible humidity                 | 5 – 95% (non-condensing)           |         |          | 5 – 95% (non-condensing)         |         |          |
| Maintenance                          | Hardware fully maintenance-free    |         |          | Hardware fully maintenance-free  |         |          |
| Dust-protected                       | Yes                                |         |          | Yes                              |         |          |



# IT SIMPLY OFFERS YOU MORE!

**Up to 2,160 compartments on a footprint of 1.5 m<sup>2</sup>, flexible configuration, extremely rugged, easy to operate and available 24/7: StoreManager<sup>PRO</sup> offers you more of everything.**

With the ARNO StoreManager<sup>PRO</sup>, you benefit from smooth functioning tool management, tool tracing and tool replacement – and thus from more efficient internal production processes. The modular system has many software options to adapt the system to your requirements with up to 2,160 configurable compartments to ensure controlled individual removal and a return option for each tool.

It makes tool management and repurchasing simpler and more efficient. You can trigger orders to any number of suppliers at any time or production workers can easily generate order proposals for the purchasing department. The practical orientation of the software design allows you to conveniently edit data from a workplace PC.



## **MORE ADVANTAGES** of the ARNO StoreManager<sup>PRO</sup>

Fully modular to permit user-defined adaptations of compartment configurations and software functions

Sensational price/performance ratio – cost per compartment starting at 15.00 Euro

Space-saving: up to 2,160 compartments on a footprint of only 1.3 m<sup>2</sup>

At a glance  
[toolmanagement.arno.de](http://toolmanagement.arno.de)  
Take a look and find out!



## StoreManager<sup>PRO</sup> Facts and Figures

2 variants with a footprint of  
d 1.20 x w 1.09 x h 1.95 m = less than 1.3 m<sup>2</sup>

- StoreManager<sup>PRO</sup> 2160 Master with up to 2,160 compartments for individual item removal
- StoreManager<sup>PRO</sup> 1080 Master with up to 1,080 compartments for individual item removal

**4 compartment sizes – user-configurable:**  
Equip your StoreManagerPRO to meet your requirements.



Compartment sizes, 1x compartment (w x h x d):

|       |          |       |        |
|-------|----------|-------|--------|
| Front | 38 mm    | 50 mm | 205 mm |
| Rear  | 18/28 mm |       |        |



Compartment sizes, 2x compartment (w x h x d):

|       |          |        |        |
|-------|----------|--------|--------|
| Front | 38 mm    | 100 mm | 205 mm |
| Rear  | 18/28 mm |        |        |



Compartment sizes, 3x compartment (w x h x d):

|       |        |       |        |
|-------|--------|-------|--------|
| Front | 122 mm | 50 mm | 205 mm |
| Rear  | 74 mm  |       |        |



Compartment sizes, 6x compartment (w x h x d):

|       |        |        |        |
|-------|--------|--------|--------|
| Front | 122 mm | 100 mm | 205 mm |
| Rear  | 74 mm  |        |        |

### Optional additional service



On-site training for min.  
one working day



StoreManager<sup>PRO</sup> put into service  
by technical staff



Import of data to your database  
(using prepared Excel spreadsheet)

**Flexible payment terms are available.**  
Please contact us.

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# EXPANDABLE TO MEET ANY REQUIREMENT.

We offer expansion systems (Plus modules) in various sizes to add to your StoreManager<sup>PRO</sup> Master system.



## StoreManager<sup>PRO</sup> 2160 Plus

- Footprint 1,200 mm x 1,085 mm (~1.3 m<sup>2</sup>)
- Same layout as StoreManager<sup>PRO</sup> 2160 Master
- (but without PC, monitor and scanner)



## StoreManager<sup>PRO</sup> 1080 Plus

- Footprint 1,200 mm x 1,085 mm (~1.3 m<sup>2</sup>)
- Same layout as StoreManager<sup>PRO</sup> 1080 Master
- (but without PC, monitor and scanner)

### Dimensions

Width (without side monitor)

Depth

Height

Footprint

Weight empty

### Compartment sizes, w x h x d

Number of compartments (max.)

1x compartment

2x compartment

3x compartment

6x compartment

### Drawer height

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### General

Max. rotation speed

Max. access time

Power supply

Operation

Network connection

Permissible temperature in operation

Permissible humidity

Maintenance

Dust-protected



Do you need more storage space?  
The modular StoreManager system is easy to expand.



**StoreManager<sup>PRO</sup>  
2160 Master**

**StoreManager<sup>PRO</sup>  
1080 Master**

**StoreManager<sup>PRO</sup>  
2160 Plus**

**StoreManager<sup>PRO</sup>  
1080 Plus**

|                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| 1,200 mm             | 1,200 mm             | 1,200 mm             | 1,200 mm             |
| 1,200 mm             | 1,200 mm             | 1,085 mm             | 1,085 mm             |
| 1,950 mm             | 1,950 mm             | 1,950 mm             | 1,950 mm             |
| ≤ 1.5 m <sup>2</sup> | ≤ 1.5 m <sup>2</sup> | ≤ 1.5 m <sup>2</sup> | ≤ 1.5 m <sup>2</sup> |
| approx. 550 kg       | approx. 550 kg       | approx. 540 kg       | approx. 540 kg       |

|               |          |          |               |          |          |               |          |          |               |          |          |
|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|
| 2,160         |          |          | 1,080         |          |          | 2,160         |          |          | 1,080         |          |          |
| Front 38 mm   | x 50 mm  | x 205 mm | Front 38 mm   | x 50 mm  | x 205 mm | Front 38 mm   | x 50 mm  | x 205 mm | Front 38 mm   | x 50 mm  | x 205 mm |
| Rear 18/28 mm |          |          | Rear 18/28 mm |          |          | Rear 18/28 mm |          |          | Rear 18/28 mm |          |          |
| Front 38 mm   | x 100 mm | x 205 mm | Front 38 mm   | x 100 mm | x 205 mm | Front 38 mm   | x 100 mm | x 205 mm | Front 38 mm   | x 100 mm | x 205 mm |
| Rear 18/28 mm |          |          | Rear 18/28 mm |          |          | Rear 18/28 mm |          |          | Rear 18/28 mm |          |          |
| Front 122 mm  | x 50 mm  | x 205 mm | Front 122 mm  | x 50 mm  | x 205 mm | Front 122 mm  | x 50 mm  | x 205 mm | Front 122 mm  | x 50 mm  | x 205 mm |
| Rear 74 mm    |          |          | Rear 74 mm    |          |          | Rear 74 mm    |          |          | Rear 74 mm    |          |          |
| Front 122 mm  | x 100 mm | x 205 mm | Front 122 mm  | x 100 mm | x 205 mm | Front 122 mm  | x 100 mm | x 205 mm | Front 122 mm  | x 100 mm | x 205 mm |
| Rear 74 mm    |          |          | Rear 74 mm    |          |          | Rear 74 mm    |          |          | Rear 74 mm    |          |          |

|   |   |   |   |
|---|---|---|---|
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |
| - | - | - | - |

|                                 |                                 |                                 |                                 |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 2 rpm                           | 2 rpm                           | 2 rpm                           | 2 rpm                           |
| 15 seconds                      | 15 seconds                      | 15 seconds                      | 15 seconds                      |
| 230 volts / 50 Hz               | 230 volts / 50 Hz               | 230 volts / 50 Hz               | 230 volts / 50 Hz               |
| Touch screen, barcode scanner   | Touch screen, barcode scanner   | -                               | -                               |
| LAN socket / GSM module         | LAN socket / GSM module         | via Master                      | via Master                      |
| +10°C to +40°C                  | +10°C to +40°C                  | +10°C to +40°C                  | +10°C to +40°C                  |
| 5 – 95% (non-condensing)        | 5 – 95% (non-condensing)        | 5 – 95% (non-condensing)        | 5 – 95% (non-condensing)        |
| Hardware fully maintenance-free | Hardware fully maintenance-free | Hardware fully maintenance-free | Hardware fully maintenance-free |
| Yes                             | Yes                             | Yes                             | Yes                             |





# SMALL CABINET FOR LARGE ITEMS.

**Perfect for long and large items: StoreManager<sup>START</sup> – the drawer system from ARNO.**

StoreManager<sup>START</sup> is the best expansion for the StoreManager<sup>PRO</sup>. If the size of the compartments on the carousel system is too small, we offer our StoreManager<sup>START</sup> which has a number of different compartment sizes and drawer configurations to choose from. The number and height of the drawers are user-configurable as well as the configuration of the individual drawers.

Of course, StoreManager<sup>START</sup> also has a system expansion option by connecting Plus variants. As with StoreManager<sup>PRO</sup> you benefit from the easy to operate software with its many practical functions and the convenient option of managing data from a PC.



## Configuration options

The main system measures 717 x 725 x 1,600 mm (footprint 0.6 m<sup>2</sup>) and you can configure it with the following drawers and compartments to meet your requirements:

### Drawers

Choose from the following heights for the fully extending drawers (Σ 900 mm)

| Fully extending drawers                   | 75 mm | 100 mm | 150 mm | 200 mm | 250 mm | 300 mm |
|---|-------|--------|--------|--------|--------|--------|
| Available with individual compartments    | •     | •      | •      |        |        |        |
| Available without individual compartments | •     | •      | •      | •      | •      | •      |

### Compartments

You can also select the number and size of the electronically locked individual compartments. The size of the compartments refers to the inner dimensions (useful area).

| Drawer height              | 75 mm             | 100 mm            | 150 mm                                  |
|----------------------------|-------------------|-------------------|---|
| 4 individual compartments  | –                 | 594 x 111 x 61 mm | 296 x 260 x 111 mm   594 x 111 x 111 mm |
| 6 individual compartments  | 594 x 62 x 36 mm  | –                 | –                                       |
| 8 individual compartments  | 296 x 111 x 36 mm | 296 x 111 x 61 mm | 296 x 111 x 111 mm                      |
| 12 individual compartments | 98 x 260 x 36 mm  | 98 x 260 x 61 mm  | –                                       |
| 16 individual compartments | 147 x 111 x 36 mm | 147 x 111 x 61 mm | 147 x 111 x 111 mm                      |





## StoreManager<sup>START</sup> 717 Master Configuration examples

### Footprint

717 mm w x 725 mm d x 1,600 mm h

### Example 1

- 1 drawer 100 mm (without ind. compartments)
- 1 drawer 200 mm (without individual compartments)
- 2 drawer 300 mm (without individual compartments)

### Example 2

- 1 drawer 100 mm, 16 individual compartments
- 1 drawer 100 mm, 12 individual compartments
- 1 drawer 100 mm, 8 individual compartments
- 1 drawer 75 mm, 6 individual compartments
- 1 drawer 75 mm (without individual compartments)
- 1 drawer 150 mm (without individual compartments)
- 1 drawer 300 mm (without individual compartments)

### Example 3

- 1 drawer 100 mm, 16 individual compartments
- 1 drawer 150 mm, 16 individual compartments
- 2 drawers 100 mm, 12 individual compartments
- 2 drawers 150 mm, 8 individual compartments
- 2 drawers 75 mm, 6 individual compartments



## MAJOR ADVANTAGES

of the ARNO StoreManager<sup>START</sup>

Perfect for large or small items, for example,  
complete tools

Flexibly selectable drawer configurations

Expandable with additional cabinets at any time

### Optional additional service



On-site training for min. one  
working day



StoreManager<sup>START</sup> put into service  
by technical staff



Import of data to your database (using  
prepared Excel spreadsheet)

**Flexible payment terms are available.  
Please contact us.**



# INDIVIDUALLY CONFIGURABLE.

We offer expansion systems (Plus modules) in various sizes to add to your StoreManager<sup>START</sup> Master system.



## StoreManager<sup>START</sup> 717 Plus

- Footprint 717 x 725 mm (≤ 0.6 m<sup>2</sup>)
- This expansion system has the same length and width as the StoreManager<sup>START</sup> Master. Turn to page 29 for the possible number and size of electronically locked drawers and compartments.
- **The following heights (outer dimensions) are available:** 700 mm, 850 mm, 1,000 mm, 1,150 mm, 1,450 mm



## StoreManager<sup>START</sup> 1023 Plus

- Footprint 1,023 x 725 mm (≤ 0.8 m<sup>2</sup>)
- This expansion system is wider than the StoreManager<sup>START</sup> 717, but it can only be equipped with electronically interlocked drawers without individual compartments.

**The following heights (outer dimensions) are available:** 700 mm, 850 mm, 1,000 mm, 1,450 mm



### Dimensions

Width

Depth

Height

Footprint

Weight empty

### Compartment sizes, w x h x d

Number of compartments (max.)

1x compartment

2x compartment

3x compartment

6x compartment

### Drawer height

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### General

Max. rotation speed

Max. access time

Power supply

Operation

Network connection

Permissible temperature in operation

Permissible humidity

Maintenance

Dust-protected

Do you want to know more?  
Simply write to us at: [storemanager@arno.de](mailto:storemanager@arno.de)



**StoreManager<sup>START</sup> 717 Master**

**StoreManager<sup>START</sup> 717 Plus**

**StoreManager<sup>START</sup> 1023 Plus**

|  |   |  |
|--|---|--|
| 717 mm   | 717 mm  | 1,023 mm                                       |
| 725 mm   | 725 mm  | 725 mm   |
| 1,600 mm                                       | 700 mm / 850 mm / 1,000 mm /<br>1,150 mm / 1,450 mm | 700 mm / 850 mm / 1,000 mm /<br>1,450 mm       |
| ≤ 0.6 m <sup>2</sup>                           | ≤ 0.6 m <sup>2</sup>                                | ≤ 0.8 m <sup>2</sup>                           |
| Depending on configuration                     | Depending on configuration                          | Depending on configuration                     |
| -  | -   | -  |
| -  | -   | -  |
| -  | -   | -  |
| -  | -   | -  |
| -  | -   | -  |
| 1 / 6 / 8 / 12 / 16 compartments               | 1 / 6 / 8 / 12 / 16 compartments                    | Only available without individual compartments |
| 1 / 4 / 8 / 12 / 16 compartments               | 1 / 4 / 8 / 12 / 16 compartments                    | Only available without individual compartments |
| 1 / 4 / 8 / 16 compartments                    | 1 / 4 / 8 / 16 compartments                         | Only available without individual compartments |
| Only available without individual compartments | Only available without individual compartments      | Only available without individual compartments |
| Only available without individual compartments | Only available without individual compartments      | Only available without individual compartments |
| Only available without individual compartments | Only available without individual compartments      | Only available without individual compartments |
| -  | -   | -  |
| 10 seconds                                     | 10 seconds  | 10 seconds                                     |
| 230 volts / 50 Hz                              | 230 volts / 50 Hz                                   | 230 volts / 50 Hz                              |
| Touch screen, barcode scanner                  | -   | -  |
| LAN socket                                     | via Master  | via Master                                     |
| +10°C to +40°C                                 | +10°C to +40°C                                      | +10°C to +40°C                                 |
| 5 – 95% (non-condensing)                       | 5 – 95% (non-condensing)                            | 5 – 95% (non-condensing)                       |
| Hardware fully maintenance-free                | Hardware fully maintenance-free                     | Hardware fully maintenance-free                |
| Yes  | Yes   | Yes  |



# TUTTO, SEMPLICEMENTE, AL SUO POSTO.

## 2.160 cassetti in solo 1,3 m<sup>2</sup>

È incredibile la capienza di StoreManager PRO. È possibile scegliere tra 4 dimensioni di scomparti con configurazioni personalizzabili.

## Tempo di fornitura circa 10 secondi

Questo è il tempo che impiega l'operatore ad avere l'utensile richiesto nelle sue mani.

## Aggiornamenti garantiti per 5 anni

Con ARNO StoreManager acquisirà un beneficio di lungo periodo. Le verrà fornito un sistema di aggiornamenti per 5 anni come parte del nostro servizio di manutenzione e supporto.

## A partire da 15 euro per scomparto

Gli StoreManager offrono un eccezionale rapporto prezzo/prestazioni.



[toolmanagement.arno.de](http://toolmanagement.arno.de)  
in sintesi  
Visiti il sito e si informi!

## Facile integrazione nella Sua produzione

Gli StoreManager sono facilmente integrabili nel processo produttivo esistente in quanto dotati di interfaccia adatta per tutti i sistemi ERP e sistemi di gestione utensili più comuni. Se necessita di un'interfaccia personalizzata possiamo facilmente crearne una adatta alle Sue esigenze a un prezzo contenuto.

## Singolo prelievo garantito

Si aprirà solo lo scomparto selezionato, nessun altro elemento potrà essere ritirato. Questo renderà ogni prelievo tracciabile.

## Variabile e modulare

La configurazione degli armadi è personalizzabile fino a 4 dimensioni di scomparti. Se in futuro lo spazio non sarà più sufficiente, potrà ampliare il sistema con altri armadi.

## Controllo al 100 % degli accessi e totale trasparenza sui costi

Totale controllo grazie al sistema di prelievo per singolo articolo garantito.

## Disponibilità H24 7 giorni su 7

Praticamente funziona su tutti i turni: è possibile aver accesso agli utensili necessari in qualsiasi momento.

## Deficit di stock 0 %

Allarme nel caso di raggiungimento dei livelli minimi impostati, il sistema può generare in automatico il ri-ordine o la richiesta di ordine. Questo vuol dire nessun fermo macchina a causa della mancanza degli utensili.

## Importazione dei dati

Con l'acquisizione dei dati utensile esistenti nel sistema StoreManager Le rendiamo più semplice iniziare a utilizzare i nostri dispositivi automatici di distribuzione utensili.



# COMBINAZIONE POTENTE.

**Doppio vantaggio: ARNO StoreManager<sup>DUO</sup> combina i vantaggi di un sistema a carosello e un sistema di cassetti.**

Ideale per piccole aziende o singole divisioni: lo StoreManager<sup>DUO</sup> è dotato di una sezione superiore composta da 360 singoli scomparti in un sistema a carosello per riporre strumenti e piccole parti. La sezione inferiore ha quattro cassetti che offrono uno spazio aggiuntivo per oggetti più grandi. Con ARNO StoreManager<sup>DUO</sup> avete tutto sotto controllo: inserti, punte per trapano, frese, adattatori, strumenti di misurazione, utensili speciali, ecc.

La cosa migliore è convincersi in prima persona dei vantaggi della gestione automatizzata degli utensili - grazie al modello a noleggio ARNO che include un test di 30 giorni senza rischi e senza dover fare grandi investimenti. Un collegamento al futuro per le aziende di tutte le dimensioni.

[toolmanagement.arno.de](http://toolmanagement.arno.de)  
in sintesi  
Visiti il sito e si informi!



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## Modulo principale



- Modulo con PC, monitor, lettore FID e scanner di codici a barre
- 360 scomparti accessibili singolarmente e 4 cassetti (bloccati singolarmente)



## Modulo di espansione Plus

- Ogni modulo DUO Master può essere ampliato aggiungendo fino a 2 moduli DUO Plus
- Ogni modulo aggiuntivo offre un altro carosello da 360 posizioni e 4 cassetti.



## VANTAGGI COMBINATI

di ARNO StoreManager<sup>DUO</sup>

Carosello combinato e cassetiera – 360 scomparti individuali e 4 cassetti.

Ideale per piccole aziende o per singole divisioni produttive.

Solo vantaggi, nessun rischio – con l'innovativa proposta di noleggio ARNO

Connessione a sistemi ERP tramite interfaccia CSV

## StoreManager<sup>DUO</sup> dati principali

Disponibile in configurazione fissa con 360 scomparti e 4 cassetti.

Scomparto singolo 180x "grande/dritto"  
Larghezza frontale: 87 mm | Larghezza posteriore: 68 mm | Profondità: 195 mm | Altezza: 53 mm

180 Scomparti singoli "piccoli / conici"  
Larghezza frontale: 87 mm | Larghezza posteriore: 6 mm | Profondità: 195 mm | Altezza: 53 mm

Cassetto 2x, Altezza 100 mm

Dimensioni interne (utilizzabili): 612 x 612 mm

Cassetto 2x, Altezza 200 mm

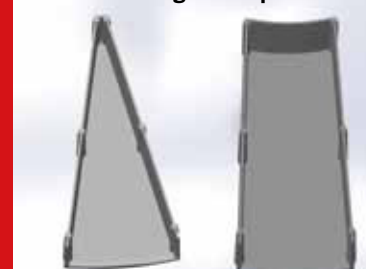
Dimensioni interne (utilizzabili): 612 x 612 mm



Carosello

15 livelli ciascuno con 24 scomparti

## Dimensioni degli scomparti



Scomparti di 2 misure con prelievo singolo garantito



Cassetto

2 altezze: 100 e 200 mm



# PRATICO: IL CONCETTO DI NOLEGGIO PER IL DUO.

Pronto per il futuro: Con ARNO StoreManager<sup>DUO</sup> per il noleggio l'ingresso nella gestione utensili digitale è ancora più semplice.



## NESSUN RISCHIO

con il concetto di noleggio per ARNO StoreManager<sup>DUO</sup>

Nessun costo di assistenza / manutenzione / parti di ricambio – il noleggio mensile copre tutto.

Lo provi senza alcun rischio - entro i primi 30 giorni dalla messa in funzione potrà restituire l'apparecchiatura

Rata mensile bassa che diminuisce con l'aumento acquisto degli utensili – la rata è calcolata e adattata in base al fatturato (in prodotti ARNO) in riferimento all'anno precedente.

Tutte le funzioni di base sono coperte dal noleggio. Questo vale anche per tutti gli aggiornamenti software.

Maggiore il consumo di utensili, minore il costo noleggio.  
**Il nostro innovativo programma di noleggio.**

### Modulo principale

- Ogni modulo DUO Master può essere espanso aggiungendo fino a 2 moduli DUO Plus.



| Dimensioni                                   | StoreManager <sup>DUO</sup> Master            |         |          | StoreManager <sup>DUO</sup> Plus              |         |          |
|--|---|---------|----------|---|---------|----------|
| Larghezza (senza schermo laterale)           | 800 mm  |         |          | 800 mm  |         |          |
| Profondità                                   | 800 mm  |         |          | 800 mm  |         |          |
| Altezza                                      | 1.828 mm                                      |         |          | 1.828 mm                                      |         |          |
| Ingombro                                     | 0,64 m <sup>2</sup>                           |         |          | 0,64 m <sup>2</sup>                           |         |          |
| Peso vuoto                                   | circa 250 kg                                  |         |          | circa 230 kg                                  |         |          |
| <b>Carosello</b>                             |   |         |          |   |         |          |
| Numero di scomparti                          | 360   |         |          | 360   |         |          |
| Scomparto grande ( L x A x P )               | Fronte 87 mm                                  | x 50 mm | x 195 mm | Fronte 87 mm                                  | x 50 mm | x 195 mm |
|  | Retro 68 mm                                   |         |          | Retro 68 mm                                   |         |          |
| Scomparto piccolo ( L x A x P )              | Fronte 87 mm                                  | x 50 mm | x 195 mm | Fronte 87 mm                                  | x 50 mm | x 195 mm |
|  | Retro 6 mm                                    |         |          | Retro 6 mm                                    |         |          |
| <b>Cassetti</b>                              |   |         |          |   |         |          |
| Numero cassetti con altezza 100 mm           | 2   |         |          | 2   |         |          |
| Numero cassetti con altezza 200 mm           | 2   |         |          | 2   |         |          |
| <b>Caratteristiche generali</b>              |   |         |          |   |         |          |
| Massima velocità di rotazione                | 2 giri/min                                    |         |          | 2 giri/min                                    |         |          |
| Massima velocità di accesso                  | 15 Secondi                                    |         |          | 15 Secondi                                    |         |          |
| Alimentazione di corrente                    | 230 volt / 50 Hz                              |         |          | 230 volt / 50 Hz                              |         |          |
| Comando                                      | Touch screen, Scanner codice a barre          |         |          | -   |         |          |
| Allacciamento alla rete                      | Presa LAN                                     |         |          | -   |         |          |
| Temperatura ammessa durante il funzionamento | da +10°C a +40°C                              |         |          | da +10°C a +40 °C                             |         |          |
| Umidità dell'aria consentita                 | 5 – 95% (Senza condensa)                      |         |          | 5 – 95% (Senza condensa)                      |         |          |
| Manutenzione                                 | Hardware completamente esente da manutenzione |         |          | Hardware completamente esente da manutenzione |         |          |
| Protezione alle polveri                      | Sì  |         |          | Sì  |         |          |



# SEMPLICEMENTE OFFRE QUALCOSA DI PIÙ.

**Fino a 2.160 scomparti su un ingombro di 1,5 m<sup>2</sup>, configurazione flessibile, estremamente robusto, facile da usare e disponibile 24/7: StoreManager<sup>PRO</sup> Le offre assolutamente di più.**

Con ARNO StoreManager<sup>PRO</sup> può beneficiare di una semplice gestione degli utensili, dalla loro tracciabilità al ri-ordine – che con questo rende più efficiente il processo di produzione interno. Il sistema è modulare e dotato di numerose opzioni software per adattare il sistema alle Sue necessità con un massimo di 2.160 scomparti configurabili per garantire un controllo su ogni singolo prelievo ed un'opzione di ri-approvvigionamento per ogni utensile.

La gestione ed il ri-ordine degli utensili diventano più semplici ed efficienti. Può inviare ordini a un qualsiasi numero di fornitori e in qualsiasi momento oppure semplicemente lasciare che siano gli operatori di produzione a inviare richieste di ordine all'ufficio acquisti. L'interfaccia semplice del software consente di modificare comodamente i dati da un PC dal proprio posto di lavoro.



## ULTERIORI VANTAGGI

di ARNO StoreManager<sup>PRO</sup>

Completamente modulare per consentire all'utente personalizzazioni della configurazione degli scomparti e le funzioni software

Rapporto prezzo / prestazioni sensazionale – costo per scomparto a partire da 15 euro

Risparmio di spazio: fino a 2.160 scomparti su un ingombro di soli 1,3 m<sup>2</sup>

[toolmanagement.arno.de](http://toolmanagement.arno.de)  
in sintesi  
Visiti il sito e si informi!

T



## StoreManager<sup>PRO</sup> dati principali

2 varianti con dimensioni di montaggio  
P 1,20 x L 1,09 x A 1,95 m = una superficie  
di appoggio circa 1,3 m<sup>2</sup>

- StoreManager<sup>PRO</sup> 2160 Master con un massimo di 2.160 scomparti per il prelievo di singoli articoli
- StoreManager<sup>PRO</sup> 1080 Master con un massimo di 1.080 scomparti per il prelievo di singoli articoli

**4 dimensioni scomparto – configurabile dall'utente:  
Equipaggi il Suo StoreManagerPRO per soddisfare le Sue esigenze.**



**Dimensioni vano - 1 scomparto (L x A x P):**

|        |          |       |        |
|--------|----------|-------|--------|
| Fronte | 38 mm    | 50 mm | 205 mm |
| Retro  | 18/28 mm |       |        |



**Dimensioni vano - 2 scomparti (L x A x P):**

|        |          |        |        |
|--------|----------|--------|--------|
| Fronte | 38 mm    | 100 mm | 205 mm |
| Retro  | 18/28 mm |        |        |



**Dimensioni vano - 3 scomparti (L x H x P):**

|        |        |       |        |
|--------|--------|-------|--------|
| Fronte | 122 mm | 50 mm | 205 mm |
| Retro  | 74 mm  |       |        |



**Dimensioni vano - 6 scomparti (L x H x P):**

|        |        |        |        |
|--------|--------|--------|--------|
| Fronte | 122 mm | 100 mm | 205 mm |
| Retro  | 74 mm  |        |        |

### Servizio aggiuntivo opzionale



Corso di addestramento di almeno una giornata lavorativa, da voi in loco



Messa in funzione di StoreManager<sup>PRO</sup> da parte del personale tecnico



Importazione di dati nel tuo database (tramite foglio Excel preimpostato)

**Modalità di pagamento flessibili.  
Ci contatti per un preventivo.**

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# IMPLEMENTABILE PER RISPONDERE A QUALUNQUE NECESSITÀ.

Offriamo sistemi di espansione (moduli Plus) di varie dimensioni da aggiungere al Suo sistema master StoreManager<sup>PRO</sup>.



## StoreManager<sup>PRO</sup> 2160 Plus

- Ingombro 1.200 mm x 1.085 mm (~ 1,3 m<sup>2</sup>)
- Stesso design di StoreManager<sup>PRO</sup> 2160 Master
- (senza PC, monitor e scanner)



## StoreManager<sup>PRO</sup> 1080 Plus

- Ingombro 1.200 mm x 1.085 mm (~ 1,3 m<sup>2</sup>)
- Stesso design di StoreManager<sup>PRO</sup> 1080 Master
- (senza PC, monitor e scanner)

### Dimensioni

Larghezza (senza schermo laterale)

Profondità

Altezza

Ingombro

Peso vuoto

### Dimensione scomparti L x H x P

Numero di scomparti (massimo)

1 scomparto

2 scomparti

3 scomparti

6 scomparti

### Altezza del cassetto

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### Caratteristiche generali

Massima velocità di rotazione

Massima velocità di accesso

Alimentazione di corrente

Comando

Allacciamento alla rete

Temperatura ammessa durante il funzionamento

Umidità dell'aria consentita

Manutenzione

Protezione alle polveri

Ha bisogno di maggiore spazio per lo stoccaggio?  
Il sistema modulare StoreManager è facile da implementare.



**StoreManager<sup>PRO</sup>  
2160 Master**

**StoreManager<sup>PRO</sup>  
1080 Master**

**StoreManager<sup>PRO</sup>  
2160 Plus**

**StoreManager<sup>PRO</sup>  
1080 Plus**

1.200 mm

1.200 mm

1.200 mm

1.200 mm

1.200 mm

1.200 mm

1.085 mm

1.085 mm

1.950 mm

1.950 mm

1.950 mm

1.950 mm

≤ 1,5 m<sup>2</sup>

≤ 1,5 m<sup>2</sup>

≤ 1,5 m<sup>2</sup>

≤ 1,5 m<sup>2</sup>

circa 550 kg

circa 550 kg

circa 540 kg

circa 540 kg

2.160

1.080

2.160

1.080

Fronte 38 mm  
Retro 18/28 mm x 50 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 50 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 50 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 50 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 100 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 100 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 100 mm x 205 mm

Fronte 38 mm  
Retro 18/28 mm x 100 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 50 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 50 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 50 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 50 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 100 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 100 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 100 mm x 205 mm

Fronte 122 mm  
Retro 74 mm x 100 mm x 205 mm

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2 giri/min

2 giri/min

2 giri/min

2 giri/min

15 Secondi

15 Secondi

15 Secondi

15 Secondi

230 Volt/50Hz

230 Volt/50Hz

230 Volt/50Hz

230 Volt/50Hz

Touch screen, Scanner codice a barre

Touch screen, Scanner codice a barre

-

-

Pres a LAN / Modulo GSM

Pres a LAN / Modulo GSM

Tramite Master

Tramite Master

da +10°C a +40°C

da +10°C a +40°C

da +10°C a +40°C

da +10°C a +40°C

5 – 95% (Senza condensa)

5 – 95% (Senza condensa)

5 – 95% (Senza condensa)

5 – 95% (Senza condensa)

Hardware completamente esente da manutenzione

Hardware completamente esente da manutenzione

Hardware completamente esente da manutenzione

Hardware completamente esente da manutenzione

Si

Si

Si

Si



# UNA PICCOLA CASSETTIERA PER GRANDI OGGETTI.

**Perfetto per articoli lunghi e di grandi dimensioni: StoreManager<sup>START</sup> – il sistema a cassette di ARNO.**

StoreManager<sup>START</sup> è la migliore espansione per StoreManager<sup>PRO</sup>. Se la dimensione degli scomparti sul sistema a carosello è troppo piccola, offriamo il nostro StoreManager<sup>START</sup> che ha un numero più elevato di configurazioni del vano tra cui scegliere. Il numero e l'altezza dei cassetti sono configurabili dall'utente così come la dotazione interna dei singoli cassetti.

Naturalmente, StoreManager<sup>START</sup> ha anche un'opzione di espansione del sistema che si ottiene collegando le varianti Plus. Come con StoreManager<sup>PRO</sup> può beneficiare del software facile da usare con le sue numerose funzionalità e la comoda opzione di gestione dei dati da un PC.

[toolmanagement.arno.de](http://toolmanagement.arno.de)  
in sintesi  
Visiti il sito e si informi!

## Opzioni di configurazione

Il sistema principale misura 717 x 725 x 1.600 mm (ingombro di 0,6 m<sup>2</sup>) e Lei può configurarlo con i seguenti cassetti e scomparti per soddisfare le Sue esigenze:

### Cassetti

Per i cassetti completamente estraibili può scegliere tra le seguenti altezze (Σ 900 mm)

| Cassetti completamente estraibili   | 75 mm | 100 mm | 150 mm | 200 mm | 250 mm | 300 mm |
|-------------------------------------|-------|--------|--------|--------|--------|--------|
| Disponibile con singoli scomparti   | •     | •      | •      |        |        |        |
| Disponibile senza singoli scomparti | •     | •      | •      | •      | •      | •      |

### Scomparti

È inoltre possibile selezionare il numero e la dimensione dei singoli scomparti bloccati elettronicamente. La dimensione dei vani si riferisce alle dimensioni interne (superficie utile).

| Altezza del cassetto | 75 mm             | 100 mm            | 150 mm                                  |
|----------------------|-------------------|-------------------|---|
| 4 Scomparti singoli  | –                 | 594 x 111 x 61 mm | 296 x 260 x 111 mm   594 x 111 x 111 mm |
| 6 Scomparti singoli  | 594 x 62 x 36 mm  | –                 | –                                       |
| 8 Scomparti singoli  | 296 x 111 x 36 mm | 296 x 111 x 61 mm | 296 x 111 x 111 mm                      |
| 12 Scomparti singoli | 98 x 260 x 36 mm  | 98 x 260 x 61 mm  | –                                       |
| 16 Scomparti singoli | 147 x 111 x 36 mm | 147 x 111 x 61 mm | 147 x 111 x 111 mm                      |







## GRANDI VANTAGGI

di ARNO StoreManager<sup>START</sup>

Perfetto per oggetti grandi o piccoli, per esempio per gli utensili assemblati

Flessibile scelta della configurazione dei cassetti

Espandibile con ulteriori armadi in qualsiasi momento

## StoreManager<sup>START</sup> 717 Esempi di configurazione master

### Ingombro

L 717 mm x P 725 mm x H 1.600 mm

### Esempio 1

1 Cassetto 100 mm (Senza scomparti singoli)  
1 Cassetto 200 mm (Senza scomparti singoli)  
2 Cassetti 300 mm (Senza scomparti singoli)

### Esempio 2

1 Cassetto 100 mm, 16 Scomparti singoli  
1 Cassetto 100 mm, 12 Scomparti singoli  
1 Cassetto 100 mm, 8 Scomparti singoli  
1 Cassetto 75 mm, 6 Scomparti singoli  
1 Cassetto 75 mm (Senza scomparti singoli)  
1 Cassetto 150 mm (Senza scomparti singoli)  
1 Cassetto 300 mm (Senza scomparti singoli)

### Esempio 3

1 Cassetto 100 mm, 16 Scomparti singoli  
1 Cassetto 150 mm, 16 Scomparti singoli  
2 Cassetti 100 mm, 12 Scomparti singoli  
2 Cassetti 150 mm, 8 Scomparti singoli  
2 Cassetti 75 mm, 6 Scomparti singoli

### Servizio aggiuntivo opzionale



Corso di addestramento di almeno una giornata lavorativa, da voi in loco



Messa in funzione dello StoreManager<sup>START</sup> da parte di personale specializzato



Importazione di dati nel tuo database (tramite foglio Excel preimpostato)

**Modalità di pagamento flessibili.  
Ci contatti per un preventivo.**

T



# INDIVIDUALMENTE CONFIGURABILE.

Offriamo sistemi di espansione (moduli Plus) di varie dimensioni da aggiungere al Suo sistema master StoreManager<sup>START</sup>.



## StoreManager<sup>START</sup> 717 Plus

- Ingombro 717 x 725 mm ( $\leq 0,6 \text{ m}^2$ )
- Questo sistema supplementare ha la stessa lunghezza e la stessa larghezza dello StoreManager<sup>START</sup> Master. A pagina 29 potrà trovare il numero e la dimensione possibile degli scomparti e cassetti bloccabili elettronicamente.
- Sono disponibili le seguenti altezze (dimensioni esterne): 700 mm, 850 mm, 1.000 mm, 1.150 mm, 1.450 mm



## StoreManager<sup>START</sup> 1023 Plus

- Ingombro 1.023 x 725 mm ( $\leq 0,8 \text{ m}^2$ )
- Questo sistema supplementare è più largo dello StoreManager<sup>START</sup> 717, tuttavia può essere dotato solamente di cassetti bloccati elettronicamente, senza scomparti singoli.

Sono disponibili le seguenti altezze (dimensioni esterne): 700 mm, 850 mm, 1.000 mm, 1.450 mm



### Dimensioni

Larghezza

Profondità

Altezza

Ingombro

Peso vuoto

### Dimensione scomparti L x H x P

Numero di scomparti (massimo)

1 scomparto

2 scomparti

3 scomparti

6 scomparti

### Altezza del cassetto

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### Caratteristiche generali

Massima velocità di rotazione

Massima velocità di accesso

Alimentazione di corrente

Comando

Allacciamento alla rete

Temperatura ammessa durante il funzionamento

Umidità dell'aria consentita

Manutenzione

Protezione alle polveri

Vuole saperne di più?

È sufficiente che ci scriva a: [info@arno-italia.it](mailto:info@arno-italia.it)



### StoreManager<sup>START</sup> 717 Master

### StoreManager<sup>START</sup> 717 Plus

### StoreManager<sup>START</sup> 1023 Plus

|   |   |   |
|---|---|---|
| 717 mm  | 717 mm  | 1.023 mm                                      |
| 725 mm  | 725 mm  | 725 mm  |
| 1.600 mm                                      | 700 mm / 850 mm / 1.000 mm /<br>1.150 mm / 1.450 mm | 700 mm / 850 mm / 1.000 mm<br>1.450 mm        |
| ≤ 0,6 m <sup>2</sup>                          | ≤ 0,6 m <sup>2</sup>                                | ≤ 0,8 m <sup>2</sup>                          |
| A seconda della configurazione                | A seconda della configurazione                      | A seconda della configurazione                |
| -   | -   | -   |
| -   | -   | -   |
| -   | -   | -   |
| -   | -   | -   |
| -   | -   | -   |
| 1 / 6 / 8 / 12 / 16 Scomparti                 | 1 / 6 / 8 / 12 / 16 Scomparti                       | Disponibile solo senza scomparti singoli      |
| 1 / 4 / 8 / 12 / 16 Scomparti                 | 1 / 4 / 8 / 12 / 16 Scomparti                       | Disponibile solo senza scomparti singoli      |
| 1 / 4 / 8 / 16 Scomparti                      | 1 / 4 / 8 / 16 Scomparti                            | Disponibile solo senza scomparti singoli      |
| Disponibile solo senza scomparti singoli      | Disponibile solo senza scomparti singoli            | Disponibile solo senza scomparti singoli      |
| Disponibile solo senza scomparti singoli      | Disponibile solo senza scomparti singoli            | Disponibile solo senza scomparti singoli      |
| Disponibile solo senza scomparti singoli      | Disponibile solo senza scomparti singoli            | Disponibile solo senza scomparti singoli      |
| -   | -   | -   |
| 10 Secondi                                    | 10 Secondi  | 10 Secondi                                    |
| 230 Volt/50Hz                                 | 230 Volt/50Hz                                       | 230 Volt/50Hz                                 |
| Touch screen, Scanner codice a barre          | -   | -   |
| Presa LAN                                     | Tramite Master                                      | Tramite Master                                |
| da +10°C a +40°C                              | da +10°C a +40°C                                    | da +10°C a +40°C                              |
| 5 – 95% (Senza condensa)                      | 5 – 95% (Senza condensa)                            | 5 – 95% (Senza condensa)                      |
| Hardware completamente esente da manutenzione | Hardware completamente esente da manutenzione       | Hardware completamente esente da manutenzione |
| Si  | Si  | Si  |



# L'ORDRE DOIT ÊTRE UN JEU D'ENFANT.

## 2 160 emplacements sur 1,3 m<sup>2</sup>

Le StoreManager<sup>PRO</sup> est un véritable prodige du rangement. Vous pouvez choisir entre 4 dimensions de compartiments que vous pouvez diviser et attribuer individuellement.

## Environ 10 secondes par accès

C'est la rapidité à laquelle l'opérateur dispose de l'outil souhaité.

## 5 années de mises à jour garanties

Vous profitez à long terme des systèmes ARNO StoreManager. Vous recevez des mises à jour du système pendant au moins 5 ans dans le cadre du contrat de maintenance et d'assistance.

## À partir de 15 euros par compartiment

Les systèmes StoreManager offrent un remarquable rapport qualité-prix.



Tout en un coup d'œil  
sur toolmanagement.  
arno.de

Découvrir maintenant et  
s'informer !

## Intégration parfaite dans votre système de production

Grâce à des interfaces avec tous les systèmes d'ERP et de gestion d'outils communs, les StoreManager s'intègrent très facilement dans les structures de processus existantes. S'il manque des interfaces, nous adaptons le système rapidement et de manière peu coûteuse pour vous.

## Retraits individuels garantis

Seul le compartiment préalablement choisi s'ouvre : aucun autre retrait n'est possible. Ainsi, chaque retrait peut être vraiment suivi.

## Variable et modulable

Les armoires peuvent être configurées individuellement grâce à 4 dimensions de compartiments. Si à un moment donné vous manquez d'espace, vous pouvez ajouter des placards au système.

## Contrôle d'accès à 100 % et transparence des coûts

Grâce au retrait individuel garanti, vous disposez de l'aperçu complet.

## Disponibilité 24 h/24 et 7 j/7

Pratique, surtout pour un fonctionnement longue durée : Vous pouvez accéder aux outils dont vous avez besoin à tout moment.

## 0 % de rupture de stock

Grâce à des notifications envoyées lorsque le niveau de stock minimum est dépassé et à des commandes automatiques ou à des suggestions de commande, les temps d'arrêt des machines dus à des outils manquants sont exclus.

## Importation de données

Grâce au transfert de données d'outils existantes dans le système StoreManager, nous vous facilitons les débuts avec votre nouveau distributeur automatique d'outils ARNO.



# UNE COMBINAISON FORTE.

**Mieux vaut deux fois qu'une : le système ARNO StoreManager<sup>DUO</sup> combine les avantages du système rotatif et du système à tiroirs.**

Idéal pour les petites entreprises et les îlots de production : le système StoreManager<sup>DUO</sup> offre un espace de stockage pour les outils et petites pièces dans sa partie supérieure avec 360 emplacements individuels et un espace supplémentaire pour les plus gros articles dans sa partie inférieure avec quatre tiroirs. Ainsi, avec ARNO StoreManager<sup>DUO</sup>, vous avez tout à portée de main et de vue : plaquettes, forets, fraises, supports, outils de mesure, outils spéciaux, etc.

Laissez-vous convaincre des avantages du système de gestion automatisée des outils : grâce au modèle de location ARNO incluant une option de test de 30 jours, sans risques et sans gros investissements. Un pied dans le futur pour les entreprises de n'importe quelle taille.

Tout en un  
coup d'œil sur  
[toolmanagement.arno.de](http://toolmanagement.arno.de)  
Découvrir maintenant  
et s'informer !



T

## Module Master



- Module avec PC, écran, lecteur RFID et lecteur de codes-barres
- 360 emplacements de stockage à verrouillage individuel et 4 tiroirs (à verrouillage individuel)



## Module d'extension Plus

- Chaque module Master DUO peut être étendu jusqu'à 2 modules DUO Plus
- Chaque module offre à nouveau 360 emplacements rotatifs et 4 tiroirs



## LES AVANTAGES COMBINÉS

du ARNO StoreManager<sup>DUO</sup>

Armoire à système rotatif et à système à tiroirs combinés : 360 emplacements individuels et 4 tiroirs

Idéal pour les petites entreprises ou les flots de production

Tous les avantages, aucun risque avec le modèle de location innovant ARNO

Connexion aux systèmes ERP via l'interface CSV

## StoreManager<sup>DUO</sup> chiffres clés

Disponible dans une combinaison solide de 360 emplacements individuels et de 4 tiroirs.

Compartment 180x « grand/forme droite »  
Largeur avant : 87 mm | Largeur arrière : 68 mm  
Profondeur : 195 mm | Hauteur : 53 mm

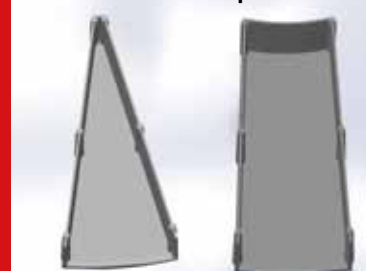
Compartment 180x « petit/forme conique »  
Largeur avant : 87 mm | Largeur arrière : 6 mm  
Profondeur : 195 mm | Hauteur : 53 mm

Tiroir 2x hauteur 100 mm  
Dimensions intérieures (utilisables) : 612 x 612 mm  
Tiroir 2x hauteur 200 mm  
Dimensions intérieures (utilisables) : 612 x 612 mm



15 niveaux avec chacun 24 compartiments

### Dimensions des compartiments



2 dimensions de compartiment avec retrait individuel garanti



2 hauteurs : 100 et 200 mm

# PRATIQUE : LE MODÈLE DE LOCATION POUR DU SYSTÈME DUO.

Prêt pour le futur : Grâce au système ARNO StoreManager<sup>DUO</sup> à louer, l'entrée dans l'ère de la gestion numérique des outils est encore plus simple.



## LES AVANTAGES SANS RISQUES

avec ARNO StoreManager<sup>DUO</sup> à louer.

Pas de frais de service, de maintenance, de réparation, de remplacement des pièces, tout est déjà compris dans le loyer mensuel

Tester sans risques – vous pouvez rendre l'appareil dans les 30 premiers jours suivants la mise en service

En cas d'augmentation du chiffre d'affaires en outils coupants, le taux mensuel diminue. Le taux est calculé et ajusté en fonction du chiffre d'affaires réalisé sur les outils l'année précédente (chez ARNO)

La location comprend toutes les fonctionnalités de base ainsi que les mises à jour logicielles

Plus de chiffre d'affaires sur les outils, moins de loyers.  
**Notre modèle de location novateur.**

### Module Master

- Chaque module Master DUO peut être étendu jusqu'à 2 modules DUO Plus



| Dimensions                                   | StoreManager <sup>DUO</sup><br>Master  | StoreManager <sup>DUO</sup><br>Plus    |
|--|--|--|
| Largeur (sans écran latéral)                 | 800 mm                                 | 800 mm                                 |
| Profondeur                                   | 800 mm                                 | 800 mm                                 |
| Hauteur                                      | 1 828 mm                               | 1 828 mm                               |
| Surface au sol                               | 0,64 m <sup>2</sup>                    | 0,64 m <sup>2</sup>                    |
| Poids à vide                                 | env. 250 kg                            | env. 230 kg                            |
| <b>Système rotatif</b>                       |  |  |
| Nombre de compartiments                      | 360                                    | 360                                    |
| Grand compartiment (La x Ha x P)             | Avant 87 mm<br>Arrière 68 mm           | x 50 mm x 195 mm                       |
| Petit compartiment (La x Ha x P)             | Avant 87 mm<br>Arrière 6 mm            | x 50 mm x 195 mm                       |
| <b>Tiroirs</b>                               |  |  |
| Nombre de tiroirs avec une hauteur de 100 mm | 2                                      | 2                                      |
| Nombre de tiroirs avec une hauteur de 200 mm | 2                                      | 2                                      |
| <b>Généralités</b>                           |  |  |
| Temps d'accès max.                           | 2 tr/min.                              | 2 tr/min.                              |
| Temps d'accès max.                           | 15 secondes                            | 15 secondes                            |
| Alimentation électrique                      | 230 Volts / 50 Hz                      | 230 Volts / 50 Hz                      |
| Manipulation                                 | Écran tactile, lecteur de codes-barres | –                                      |
| Raccord réseau                               | Prise LAN                              | –                                      |
| Température de fonctionnement admissible     | + 10 °C jusqu'à + 40 °C                | + 10 °C jusqu'à + 40 °C                |
| Humidité de l'air admissible                 | 5 – 95 % (ne formant pas de condensat) | 5 – 95 % (ne formant pas de condensat) |
| Entretien                                    | Matériel entièrement sans entretien    | Matériel entièrement sans entretien    |
| Protégé contre la poussière                  | Oui                                    | Oui                                    |





# VOUS EN AVEZ TOUT SIMPLEMENT PLUS !

**Jusqu'à 2 160 emplacements sur une surface de 1,5 m<sup>2</sup>, flexibilité de configuration, extrêmement robuste, simple d'utilisation et opérationnel 24 h/24 7 j/7 :  
Le StoreManager<sup>PRO</sup> vous offre plus qu'une solution complète.**

Avec le système ARNO StoreManager<sup>PRO</sup>, bénéficiez d'une gestion, d'un suivi et d'un remplacement des outils sans faille et par conséquent, de processus de production internes plus efficaces. Le système modulaire vous offre de nombreuses options de personnalisation du logiciel et de la configuration des quelques 2 160 emplacements, disponibles pour un retrait individuel contrôlé avec possibilité de remise en stock.

Non seulement la gestion des outils, mais aussi le réapprovisionnement devient plus efficace et plus simple. Vous pouvez à tout moment envoyer des procédures de commande à autant de fournisseurs que vous le souhaitez ou, en tant que collaborateur de la production, vous pouvez simplement créer des suggestions de commande pour le service des achats. Grâce à la structure logicielle axée sur la pratique, vous pouvez également modifier facilement des données depuis votre PC.



## PLUS D'AVANTAGES

du système ARNO StoreManager<sup>PRO</sup>

Entièrement modulaire pour la personnalisation de la composition des compartiments et des fonctionnalités du logiciel

Rapport qualité-prix sensationnel – à partir de 15 euros par compartiment

Prodige du rangement – jusqu'à 2 160 emplacements sur une surface de seulement 1,3 m<sup>2</sup>

Tout en un  
coup d'œil sur  
[toolmanagement.arno.de](http://toolmanagement.arno.de)  
Découvrir maintenant  
et s'informer !



## StoreManager<sup>PRO</sup> chiffres clés

2 variantes avec cotes P 1,20 x La 1,09 x H 1,95 m  
= surface d'env. 1,3 m<sup>2</sup>

- StoreManager<sup>PRO</sup> 2160 Master avec jusqu'à 2 160 emplacements pour le retrait individuel
- StoreManager<sup>PRO</sup> 1080 Master avec jusqu'à 1 080 emplacements pour le retrait individuel

4 dimensions de compartiments – configurables individuellement :  
Équipez le StoreManagerPRO selon vos besoins.



Dimensions du compartiment  
à 1 emplacement (La x Ha x P) :

|         |          |       |        |
|---------|----------|-------|--------|
| Avant   | 38 mm    | 50 mm | 205 mm |
| Arrière | 18/28 mm |       |        |



Dimensions du compartiment  
à 2 emplacements (La x Ha x P) :

|         |          |        |        |
|---------|----------|--------|--------|
| Avant   | 38 mm    | 100 mm | 205 mm |
| Arrière | 18/28 mm |        |        |



Dimensions du compartiment  
à 3 emplacements (La x Ha x P) :

|         |        |       |        |
|---------|--------|-------|--------|
| Avant   | 122 mm | 50 mm | 205 mm |
| Arrière | 74 mm  |       |        |



Dimensions du compartiment  
à 6 emplacements (La x Ha x P) :

|         |        |        |        |
|---------|--------|--------|--------|
| Avant   | 122 mm | 100 mm | 205 mm |
| Arrière | 74 mm  |        |        |

### Service supplémentaire en option



Formation d'au moins une journée de travail chez vous, sur place



Mise en service du StoreManager<sup>PRO</sup> par du personnel spécialisé



Enregistrement de votre base de données (selon un tableau Excel préparé)

Il existe des modalités de paiement flexibles. Veuillez nous contacter.



# EXTENSIBLES POUR CHAQUE DEMANDE.

En complément de votre système principal StoreManager<sup>PRO</sup> Master, nous pouvons vous proposer des systèmes d'extension (modules Plus) dans diverses dimensions.



## StoreManager<sup>PRO</sup> 2160 Plus

- Surface au sol 1 200 mm x 1 085 mm (~ 1,3 m<sup>2</sup>)
- Même structure que le StoreManager<sup>PRO</sup> 2160 Master
- (Sans PC, écran et scanner)



## StoreManager<sup>PRO</sup> 1080 Plus

- Surface au sol 1 200 mm x 1 085 mm (~ 1,3 m<sup>2</sup>)
- Même structure que le StoreManager<sup>PRO</sup> 1080 Master
- (Sans PC, écran et scanner)

### Dimensions

Largeur (sans écran latéral)

Profondeur

Hauteur

Surface au sol

Poids à vide

### Dimensions des compartiments

Nombre de compartiments (max.)

à 1 compartiment

à 2 compartiments

à 3 compartiments

à 6 compartiments

### Hauteur des tiroirs

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### Généralités

Vitesse de rotation max.

Temps d'accès max.

Alimentation électrique

Manipulation

Raccord réseau

Température de fonctionnement admissible

Humidité de l'air admissible

Entretien

Protégé contre la poussière

Avez-vous besoin d'encore plus d'espace ?  
Le système modulaire StoreManager peut être facilement étendu.



**StoreManager<sup>PRO</sup>  
2160 Master**

**StoreManager<sup>PRO</sup>  
1080 Master**

**StoreManager<sup>PRO</sup>  
2160 Plus**

**StoreManager<sup>PRO</sup>  
1080 Plus**

|  |  |  |  |
|--|--|--|--|
| 1 200 mm                               | 1 200 mm                               | 1 200 mm                               | 1 200 mm                               |
| 1 200 mm                               | 1 200 mm                               | 1 085 mm                               | 1 085 mm                               |
| 1 950 mm                               | 1 950 mm                               | 1 950 mm                               | 1 950 mm                               |
| ≤ 1,5 m <sup>2</sup>                   | ≤ 1,5 m <sup>2</sup>                   | ≤ 1,5 m <sup>2</sup>                   | ≤ 1,5 m <sup>2</sup>                   |
| env. 550 kg                            | env. 550 kg                            | env. 540 kg                            | env. 540 kg                            |
| 2 160                                  | 1 080                                  | 2 160                                  | 1 080                                  |
| Avant 38 mm<br>Arrière 18/28 mm        | x 50 mm x 205 mm                       | Avant 38 mm<br>Arrière 18/28 mm        | x 50 mm x 205 mm                       |
| Avant 38 mm<br>Arrière 18/28 mm        | x 100 mm x 205 mm                      | Avant 38 mm<br>Arrière 18/28 mm        | x 100 mm x 205 mm                      |
| Avant 122 mm<br>Arrière 74 mm          | x 50 mm x 205 mm                       | Avant 122 mm<br>Arrière 74 mm          | x 50 mm x 205 mm                       |
| Avant 122 mm<br>Arrière 74 mm          | x 100 mm x 205 mm                      | Avant 122 mm<br>Arrière 74 mm          | x 100 mm x 205 mm                      |
| -                                      | -                                      | -                                      | -                                      |
| -                                      | -                                      | -                                      | -                                      |
| -                                      | -                                      | -                                      | -                                      |
| -                                      | -                                      | -                                      | -                                      |
| -                                      | -                                      | -                                      | -                                      |
| -                                      | -                                      | -                                      | -                                      |
| 2 tr/min.                              | 2 tr/min.                              | 2 tr/min.                              | 2 tr/min.                              |
| 15 secondes                            | 15 secondes                            | 15 secondes                            | 15 secondes                            |
| 230 Volts / 50 Hz                      | 230 Volts / 50 Hz                      | 230 Volts / 50 Hz                      | 230 Volts / 50 Hz                      |
| Écran tactile, lecteur de codes-barres | Écran tactile, lecteur de codes-barres | -                                      | -                                      |
| Prise LAN / module GSM                 | Prise LAN / module GSM                 | via Master                             | via Master                             |
| + 10 °C jusqu'à + 40 °C                | + 10 °C jusqu'à + 40 °C                | + 10 °C jusqu'à + 40 °C                | + 10 °C jusqu'à + 40 °C                |
| 5 – 95 % (ne formant pas de condensat) | 5 – 95 % (ne formant pas de condensat) | 5 – 95 % (ne formant pas de condensat) | 5 – 95 % (ne formant pas de condensat) |
| Matériel entièrement sans entretien    | Matériel entièrement sans entretien    | Matériel entièrement sans entretien    | Matériel entièrement sans entretien    |
| Oui                                    | Oui                                    | Oui                                    | Oui                                    |

# UNE PETITE ARMOIRE POUR LES GROS ARTICLES.

**Idéal pour les gros et longs articles : le StoreManager<sup>START</sup> – le système à tiroirs d'ARNO.**

Le StoreManager<sup>START</sup> est le complément idéal au Storemanager<sup>PRO</sup>. Lorsque la taille des compartiments du système à tiroirs est insuffisante, le StoreManager<sup>START</sup> se tient prêt pour vous : un grand choix de dimensions de compartiments et de configurations de tiroirs, le nombre et la hauteur des tiroirs peuvent être configurés librement, tout comme l'aménagement intérieur de chaque tiroir.

Bien entendu, il est également possible de compléter le système StoreManager<sup>START</sup> en raccordant des variantes Plus. Tout comme avec le StoreManager<sup>PRO</sup>, vous bénéficiez du logiciel facile à utiliser avec de nombreuses fonctions pratiques et la possibilité de gérer facilement les données depuis le PC.

Tout en un  
coup d'œil sur  
[toolmanagement.arno.de](http://toolmanagement.arno.de)  
Découvrir maintenant  
et s'informer !

## Options de configuration

Selon vos besoins, vous pouvez configurer le système principal de 717 x 725 x 1 600 mm (surface au sol 0,6 m<sup>2</sup>) avec les tiroirs et compartiments suivants :

### Tiroirs

Pour les tiroirs à extension totale, vous pouvez choisir parmi les hauteurs suivantes ( $\Sigma$  900 mm)

| Tiroirs à extension totale                 | 75 mm | 100 mm | 150 mm | 200 mm | 250 mm | 300 mm |
|--|-------|--------|--------|--------|--------|--------|
| Disponibles avec compartiments individuels | •     | •      | •      |        |        |        |
| Disponibles sans compartiments individuels | •     | •      | •      | •      | •      | •      |

### Compartiment

Il est également possible de choisir le nombre et les dimensions des compartiments individuels à verrouillage électronique. La taille des compartiments se réfère à leurs dimensions internes respectives (surface utilisable).

| Hauteur des tiroirs          | 75 mm             | 100 mm            | 150 mm                                  |
|------------------------------|-------------------|-------------------|---|
| 4 compartiments individuels  | –                 | 594 x 111 x 61 mm | 296 x 260 x 111 mm   594 x 111 x 111 mm |
| 6 compartiments individuels  | 594 x 62 x 36 mm  | –                 | –                                       |
| 8 compartiments individuels  | 296 x 111 x 36 mm | 296 x 111 x 61 mm | 296 x 111 x 111 mm                      |
| 12 compartiments individuels | 98 x 260 x 36 mm  | 98 x 260 x 61 mm  | –                                       |
| 16 compartiments individuels | 147 x 111 x 36 mm | 147 x 111 x 61 mm | 147 x 111 x 111 mm                      |





## StoreManager<sup>START</sup> 717 Master Exemples de configuration

### Cotes

La 717 mm x P 725 mm x H 1 600 mm

### Exemple 1

1 tiroir 100 mm (sans comp. individuel)  
1 tiroir 200 mm (sans compartiment individuel)  
2 tiroirs 300 mm (sans comp. individuel)

### Exemple 2

1 tiroir 100 mm, 16 comp. individuels  
1 tiroir 100 mm, 12 comp. individuels  
1 tiroir 100 mm, 8 compartiments individuels  
1 tiroir 75 mm, 6 compartiments individuels  
1 tiroir 75 mm (sans comp. individuel)  
1 tiroir 150 mm (sans comp. individuel)  
1 tiroir 300 mm (sans comp. individuel)

### Exemple 3

1 tiroir 100 mm, 16 comp. individuels  
1 tiroir 150 mm, 16 comp. individuels  
2 tiroirs 100 mm, 12 comp. individuels  
2 tiroirs 150 mm, 8 comp. individuels  
2 tiroirs 75 mm, 6 comp. individuels



## LES AVANTAGES SIGNIFICATIFS

du système ARNO StoreManager<sup>START</sup>

Parfait pour les gros articles ou les articles longs  
comme les outils complets

Configuration des tiroirs pouvant être choisie de  
manière flexible

Peut être étendu d'autres armoires à tout moment

### Service supplémentaire en option



Formation d'au moins une journée  
de travail chez vous, sur place



Mise en service du StoreManager<sup>START</sup>  
par du personnel spécialisé



Enregistrement de votre base de données  
(selon un tableau Excel préparé)

**Il existe des modalités de paiement  
flexibles. Veuillez nous contacter.**

T



# RÉPARTITION INDIVIDUELLE.

En complément de votre système principal StoreManager<sup>START</sup> Master, nous pouvons vous proposer des systèmes d'extension (modules Plus) dans diverses dimensions.



## StoreManager<sup>START</sup> 717 Plus

- Surface au sol 717 x 725 mm ( $\leq 0,6 \text{ m}^2$ )
- Ce système additionnel a la même longueur et largeur que le StoreManager<sup>START</sup> Master. Vous trouverez le nombre et les dimensions possibles des tiroirs à verrouillage électronique et des compartiments individuels à la page 29.
- **Les hauteurs suivantes (dimensions extérieures) sont disponibles :** 700 mm, 850 mm, 1 000 mm, 1 150 mm, 1 450 mm



## StoreManager<sup>START</sup> 1023 Plus

- Surface au sol 1 023 x 725 mm ( $\leq 0,8 \text{ m}^2$ )
- Ce système additionnel est plus large que le StoreManager<sup>START</sup> 717, mais ne peut être complété que par les tiroirs à verrouillage électronique sans compartiments individuels.

**Les hauteurs suivantes (dimensions extérieures) sont disponibles :** 700 mm, 850 mm, 1 000 mm, 1 450 mm



### Dimensions

Largeur

Profondeur

Hauteur

Surface au sol

Poids à vide

### Dimensions des compartiments

Nombre de compartiments (max.)

à 1 compartiment

à 2 compartiments

à 3 compartiments

à 6 compartiments

### Hauteur des tiroirs

75 mm

100 mm

150 mm

200 mm

250 mm

300 mm

### Généralités

Vitesse de rotation max.

Temps d'accès max.

Alimentation électrique

Manipulation

Raccord réseau

Température de fonctionnement admissible

Humidité de l'air admissible

Entretien

Protégé contre la poussière

Vous voulez en savoir plus ?  
Écrivez-nous tout simplement à : [storemanager@arno.de](mailto:storemanager@arno.de)



### StoreManager<sup>START</sup> 717 Master

### StoreManager<sup>START</sup> 717 Plus

### StoreManager<sup>START</sup> 1023 Plus

717 mm

717 mm

1 023 mm

725 mm

725 mm

725 mm

1 600 mm

700 mm / 850 mm / 1 000 mm /  
1 150 mm / 1 450 mm

700 mm / 850 mm / 1 000 mm  
1 450 mm

≤ 0,6 m<sup>2</sup>

≤ 0,6 m<sup>2</sup>

≤ 0,8 m<sup>2</sup>

En fonction de la configuration

En fonction de la configuration

En fonction de la configuration

-

-

-

-

-

-

-

-

-

-

-

-

1 / 6 / 8 / 12 / 16 compartiments

1 / 6 / 8 / 12 / 16 compartiments

Disponibles seulement sans compartiments individuels

1 / 4 / 8 / 12 / 16 compartiments

1 / 4 / 8 / 12 / 16 compartiments

Disponibles seulement sans compartiments individuels

1 / 4 / 8 / 16 compartiments

1 / 4 / 8 / 16 compartiments

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

Disponibles seulement sans compartiments individuels

-

-

-

10 secondes

10 secondes

10 secondes

230 Volts / 50 Hz

230 Volts / 50 Hz

230 Volts / 50 Hz

Écran tactile, lecteur de codes-barres

-

-

Prise LAN

via Master

via Master

+ 10 °C jusqu'à + 40 °C

+ 10 °C jusqu'à + 40 °C

+ 10 °C jusqu'à + 40 °C

5 – 95 % (ne formant pas de condensat)

5 – 95 % (ne formant pas de condensat)

5 – 95 % (ne formant pas de condensat)

Matériel entièrement sans entretien

Matériel entièrement sans entretien

Matériel entièrement sans entretien

Oui

Oui

Oui





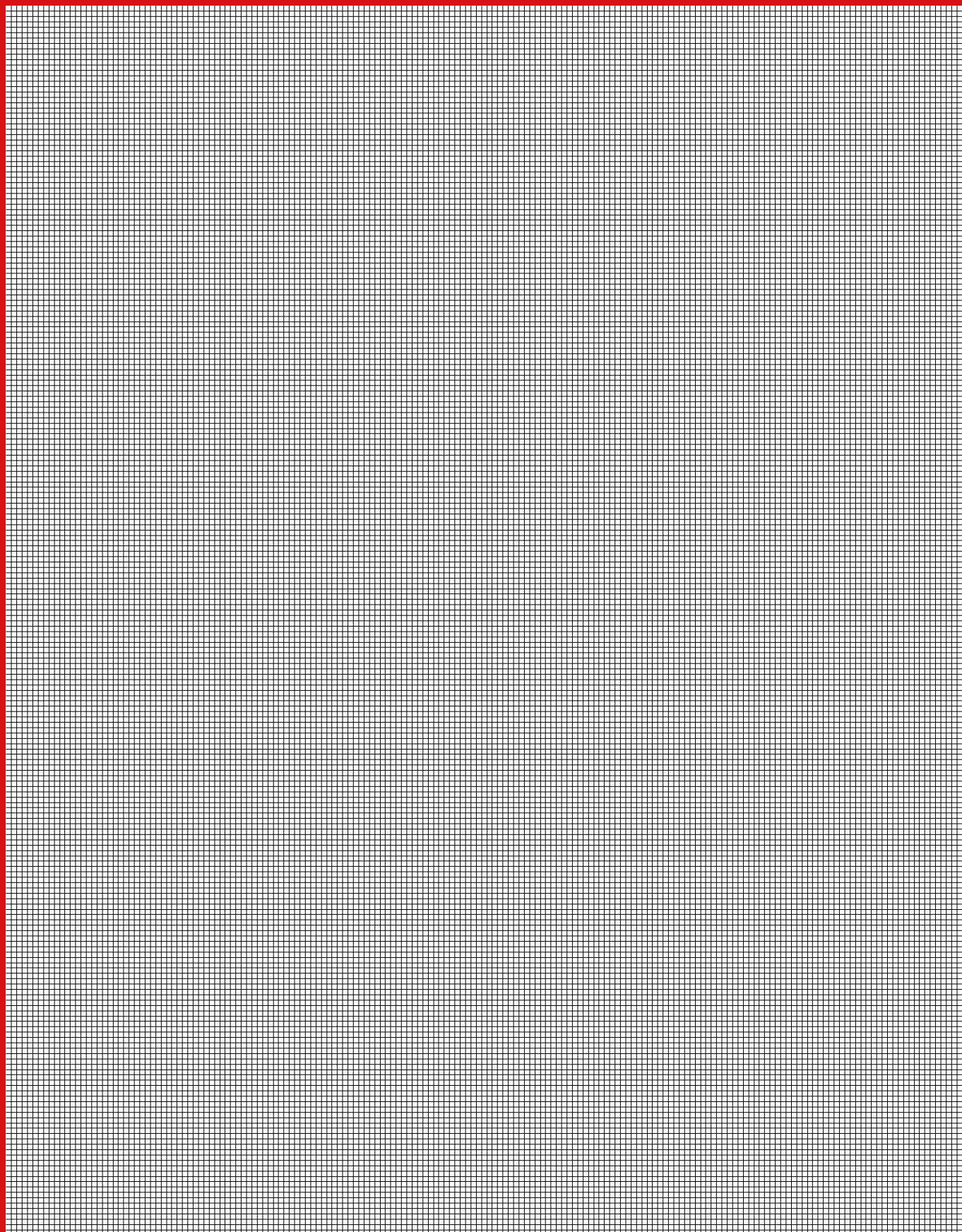
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[www.arno.de](http://www.arno.de)



# INFORMATION

## Information

- Material comparison table
- Hardness comparison
- Insert wear and solutions
- Application notes

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# Material comparison table

Tabella confronto materiali

Tableau comparatif des matériaux

| ISO  | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau EN | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S. | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|--|---|--|---|--|---|--|---|---|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b> |   |  |   |  |   |  |   |   |
| <b>P</b>   | P1  | 1.0401   |   | C 15   | C15   |  | 080M15,<br>144917CS,<br>040A15,<br>080A15                               |   |
|  | P1  | 1.0402   |   | C 22   | C22   |  | 040 A 15,<br>055 M 15, En 2,<br>22 CS, 22 HS,<br>C 22, 070 M 20         | 2D,<br>2  |
|  | P2  | 1.0501   |   | C 35   | C35   |  | 080A32,<br>080A35,<br>080M36,<br>1449.40CS                              |   |
|  | P2  | 1.0503   |   | C 45   | C45   |  | 060A47,<br>080M46,<br>1449.50HS,<br>1449.50CS                           |   |
|  | P4  | 1.0535   |   | C 55   | C55   |  | 070M55,<br>5770-50  | 9   |
|  | P4 / P5   | 1.0601   |   | C 60   | C60   |  | 060A62,<br>5770-60,<br>1449 60HS.CS                                     |   |
|  | P6  | 1.0715   |   | 9 SMn 28   | 11SMn30   |  | 230M07  |   |
|  | P6  | 1.0718   |   | 9 SMnPb 28   | 11SMnPb30   |  |   |   |
|  | P6  | 1.0722   |   | 10 SPb 20  | 10SPb20   |  |   |   |
|  | P6  | 1.0726   |   | 35 S 20  | 35S20   |  | 212M36  |   |
|  | P6  | 1.0736   |   | 9 SMn 36   | 11SMn37   |  | 240M07  | 1B  |
|  | P6  | 1.0737   |   | 9 SMnPb 36   | 11SMnPb37   | Ledloy   |   |   |
|  | P7 / P10  | 1.0904   |   |  | 55Si7   |  | 250A53  | 45  |
|  | P7 / P10  | 1.0961   |   | 60 SiCr 7  | S340MGC,<br>60SiCr7   |  | 250A61  |   |
|  | P1  | 1.1141   |   | Ck 15  | C15E  |  | 040A15,<br>080M15,<br>S14, CS17   | 32C   |
|  | P7 / H2   | 1.1157   |   | 40 Mn 4  | 40Mn4   |  | 150M36  | 15  |
|  | P1 / P3   | 1.1158   |   | Ck 25  | C25E  |  | 070M26  |   |
|  | P7  | 1.1167   |   | 36 Mn 5  | 36Mn5   |  | 150M36  | 15 B  |
|  | P7  | 1.1170   |   | 28 Mn 6  | 28Mn6   |  | 150M28,<br>150M19,<br>S92   | 14A,<br>14B   |
|  | P2  | 1.1183   |   | Cf 35  | C35G  |  | 060A35,<br>080A35   |   |
|  | P2  | 1.1191   |   | Ck 45  | C45E  |  | 080M46,<br>060A47   |   |
|  | P4 / P5   | 1.1203   |   | Ck 55  | C55E  |  | 060A57  | 9   |
|  | P2 / P3   | 1.1213   |   | Cf 53  | C53G  |  | 060A52,<br>070M55   |   |
|  | P4 / P5   | 1.1221   |   | Ck 60  | C60E  |  | 060A62,<br>070M60,<br>CS60  |   |
|  | P4 / H1   | 1.1274   |   | Ck 101   | C101E,<br>C100S   |  | 060A96,<br>5770-95,<br>CS95   |   |
|  | P11   | 1.3401   |   | X 120 Mn 12  | X120Mn12  |  |   |   |
|  | P7 / H2   | 1.3505   |   | 100 Cr 6   | 100Cr6  |  | BL3, 534A99,<br>535A99, 2S135,<br>S135                                  |   |
| P7   | 1.5415  |  | 15 Mo 3   | 16Mo3  |   | 1501-240,<br>1503-243B,<br>3606-243,<br>3059-243   |   |   |
| P3   | 1.5423  |  | 16 Mo 5   | 16Mo5  |   | 1503-245-420   |   |   |

# Material comparison table

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| ISO  | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR | Italy – UNI<br>Italia – UNI<br>Italie – UNI | Sweden – SS<br>Svezia – SS<br>Süède – SS | Spain – UNE<br>Spagna – UNE<br>España – UNE | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis – AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|--|---|---|--|---|--|--|---|---|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b> |   |   |  |   |  |  |   |   |
| <b>P</b>   | C18RR, XC18   | C15, C16, 1C15                              | 1350                                     | F.111                                       | S 15 C, JIS S 15C                            | J 409 Grade 1015   |   |   |
|  | AF42C20, XC25, 1C22                                 | C20, C21                                    | 1450                                     | 1C22, F112                                  | S 20 C, S22C, JIS S 20C                      |  | C25-1   | 20  |
|  | C35, 1C35, AF55C35                                  | C35, 1C35                                   | 1572, 155                                | F.113                                       | S 35 C                                       |  | C35-1   | 35  |
|  | 1C45, AF 65 C 45                                    | C45, 1C45                                   | 1650                                     | F.114                                       | JIS S 45C                                    |  | C45-1   | 45  |
|  | C54, 1C55, AF 70 C 55                               | C55, 1C55                                   | 1655                                     | F.115                                       | S 55 C                                       |  | C55-1   | 55  |
|  | C60, 1C60, AF70C55                                  | C60, 1C60                                   |  | F.115                                       | S 58 C                                       |  | C60-1   | 60  |
|  | S250  | CF9Mn28                                     | 1912                                     | F.2111 - 11SMn28                            | JIS SUM22                                    |  |   |   |
|  | S250Pb  | CF9SMnPb28                                  | 1914                                     | F.2112 - 11SMn-Pb28                         | SUM22L, SUM23L, SUM24L                       | 12L13, 12L14, J 403 Grade 12L14, J 1397 Grade 12L14                      |   |   |
|  |   |   |  |   |  |  |   |   |
|  | 35MF6   |   | 1957                                     | F.210G                                      |  | J 403 Grade 1141   |   |   |
|  | S300  | CF9SMn36                                    |  | F.2113 - 12 SMn 35                          | SUM 25                                       | J 403 Grade 1213, J 403 Grade 1215, J 1392 Grade 1213                    |   |   |
|  | S300Pb  | CF9SMnPb36                                  | 1926                                     | F.2114 - 12 SMnPb 35                        |  | J 403 Grade 12L14, J 1397 Grade 12L14                                    |   |   |
|  | 55S7  |   | 2085                                     | F.1440 - 56 Si 7                            |  |  |   |   |
|  | 60SC7   |   |  | F.1442 - 60 SiCr 8                          |  |  |   |   |
|  |   |   | 1370                                     | F.1511 - C 16 k, F.1110 - C 15 k            | S 15, S 15 CK, JIS S 15 C                    |  | C16-2   | 15  |
|  | 35M5  |   |  |   |  | 1035, 1041   |   | 40G   |
|  | 2C25  |   |  | F.1120 - C 25 k, C25K (F1120)               | S 25 C, S 28 C                               |  | C25-2   | 25  |
|  | 40M5  |   | 2120                                     | F.1203 - 36 Mn5                             | SMn 438 (H), SCMn 3                          |  |   | 35G2  |
|  | 20M5  | C28Mn                                       |  | 28Mn6                                       | SCMn1  | 1027   | 28Mn6   | 30G   |
|  | XC38H1TS  | C36, C38                                    |  |   | S 35 C                                       |  | C36   | 35  |
|  | C45RR, XC42H1, XC45, 2C45, XC48, XC48H1             |   | 1672                                     | F1140-C45k, F1142-C48k                      | S 45 C, S 48 C                               |  | C45-2   | 45  |
|  | XC55H1, 2C55, XC54                                  |   | 1655                                     | F.1150 - C 55 k                             | S 55 C                                       |  | C55-2   | 55  |
|  | XC48H1TS  |   |  |   | S 50 C                                       | 1050, 1055   | C53   | 50  |
| C60RR, XC60, 2C60  |   | 1665, 168                                   | F.511, F.512                             | S 58 C                                      |  | C60-2  | 60  |   |
| C100RR, C100, XC100, E 100   |   | 1870  |  | SUP4  |  |  |   |   |
| Z120M12, Z120Mn12  |   | 2183  | F.82551-AM-X 120, Mn 12                  | SCMnH1, SCMnH11                             |  |  | 110G13L   |   |
| Y100C6, 100C6, 100Cr6  | 100Cr6  | 2258  | F.5230 100 Cr6, F.1310-100 Cr 6, F.131   | SUJ 2, SUJ 4                                | L3   |  | SchCh15   |   |
| 15D3, 15Mo3  | 16Mo3 (KG KW)                                       | 2912  | F.2601-16 Mo 3                           |   |  | 16Mo3  |   |   |
|  | 16Mo5KG, 16Mo5KW                                    |   | F.2602-16Mo5                             | SB 450 M, SB 480 M                          |  | 16Mo5  |   |   |

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| ISO  | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S.   | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|--|---|--|--|--|---|--|---|---|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b> |   |  |  |  |   |  |   |   |
| <b>P</b>   | P7  | 1.5622   |  | 14 Ni 6  | 14Ni6   |  |   |   |
|  | P11   | 1.5662   |  | X 8 Ni 9   | X8Ni9   |  | 1501-509;510,<br>3603-509LT,<br>1502-502-650,<br>509-690,<br>1503-509-690 |   |
|  | P11   | 1.5680   |  | 12 Ni 19   | X12Ni5,<br>12Ni19   |  |   |   |
|  | P9  | 1.5710   |  | 36 NiCr 6  | 36NiCr6   |  | 640A35  |   |
|  | P7  | 1.5732   |  | 14 NiCr 10   | 14NiCr10  |  |   |   |
|  | P7  | 1.5752   |  | 14 NiCr 14   | 15NiCr13  |  | 655M13,<br>655A12,<br>655H13  | 36A,<br>36B   |
|  | P7 / P9   | 1.6511   |  | 36 CrNiMo 4  | 36CrNiMo4   |  | 816M40  | 110   |
|  | P7  | 1.6523   |  | 20NiCrMo2-2  | 21NiCrMo2   |  | 805H20,<br>805M20,<br>806M20  | 362   |
|  | P9  | 1.6546   |  | 40 NiCrMo 22                                       | 40NiCrMo2-2,<br>40NiCrMo2KD                                 |  | 311-Type7   |   |
|  | P7 / P9   | 1.6582   |  | 34 CrNiMo 6  | 34CrNiMo6   |  | 816M40,<br>817M40   | 24  |
|  | P7  | 1.6587   |  | 17 CrNiMo 8,<br>17 CrNiMo 6,<br>17 CrNiMo 6 BG     | 17CrNiMo6,<br>18CrNiMo7-6                                   |  | 820A16  |   |
|  | P7  | 1.6657   |  | 14 NiCrMo 134                                      | 14NiCrMo13-4  |  | 832H13,<br>832M13,<br>S157  | 36C   |
|  | P7  | 1.7015   |  | 15 Cr 3  | 15Cr2KD   |  | 523M15  | 206   |
|  | P7 / P8   | 1.7033   |  | 34 Cr 4  | 34Cr4   |  | 530A32,<br>530H32,<br>530M32  |   |
|  | P7 / P9   | 1.7035   |  | 41 Cr 4  | 41Cr4   |  | 530M40,<br>530A40,<br>530H40  | 18  |
|  | P9  | 1.7045   |  | 42 Cr 4  | 42Cr4   |  | 530A40  | 18  |
|  | P7  | 1.7131   |  | 16 MnCr 5  | 16MnCr5   |  | 527M17,<br>590H17,<br>590M17  |   |
|  | P7 / P9   | 1.7176   |  | 55 Cr 3  | 55Cr3   |  | 525A58,<br>525A60,<br>525H60  | 48  |
|  | P8  | 1.7218   |  | 25 CrMo 4  | 25CrMo4   |  | 1717CDS110,<br>708A25   |   |
|  | P7 / P9   | 1.7220   |  | 34 CrMo 4  | 34CrMo4   |  | 708A37  | 19B   |
| P7 / P9  | 1.7223  |  | 41 CrMo 4  | 41CrMo4  |   | 708M40,<br>3111-5.1  |   |   |
| P7 / P9  | 1.7225  |  | 42 CrMo 4  | 42CrMo4  |   | 708A42,<br>708M40,<br>709M40   | 19A   |   |
| P7   | 1.7262  |  | 15 CrMo 5  | 15CrMo5  |   |  |   |   |

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| ISO  | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR | Italy – UNI<br>Italia – UNI<br>Italia – UNI | Sweden – SS<br>Svezia – SS<br>Svède –SS             | Spain – UNE<br>Spagna –UNE<br>Espanya – UNE                                       | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis –<br>AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|--|---|---|---|---|--|---|---|---|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b> |   |   |   |   |  |   |   |   |
| <b>P</b>   | 16N6,<br>15N6,<br>15Ni6                             | 14Ni6KG,<br>14Ni6KT                         |   | F.2641-15Ni6  |  |   | 18Ni6   |   |
|  | Z8N9,<br>9Ni490                                     | X10Ni9,<br>X12Ni09                          |   | F.2645-X8 Ni09  | SL9N53(60)                                   |   | 10Ni36  |   |
|  | Z18N5,<br>5Ni390                                    |   |   |   |  | 2515,<br>2517   | 12Ni20  |   |
|  | 35NC6   |   |   |   | SNC 236                                      |   |   |   |
|  | 14NC11  | 16NiCr11                                    |   | F.1540-15NiCr11   | SNC 415 (H)                                  |   |   |   |
|  | 14NC11,<br>12NC15,<br>14NC12,<br>13NiCr14           |   |   |   | SNC 815 (H),<br>SNC22,<br>JIS SNC 815        | 3310,<br>3415,<br>9314  | 13NiCr12  |   |
|  | 40NCD3,<br>36CrNiMo4,<br>35NCD5                     | 38NiCrMo7 (KB)                              |   | F.1280-35NiCrMo4  |  |   |   | 40ChN2MA  |
|  | 20NCD2,<br>22NCD2                                   | 20NiCrMo2                                   | 2506  | F1552-20NiCrMo2,<br>F1534-20NiCrMo3   | SNCM 220 (H)                                 | J 1268 Grade<br>8620H   |   |   |
|  | 40NCD2  | 40NiCrMo2 (KB)                              |   | F1204-40NiCrMo2,<br>F1205-40NiCr-<br>Mo2DF  | SNCM 240                                     |   | 40NiCrMo2                                       | 38ChGNM   |
|  | 35NCD6,<br>34CrNiMo6,<br>34CrNiMo8                  | 35NiCrMo6KB                                 | 2541  | F1272-40NiCrMo7,<br>34CrNiMo6   | SNCM 447,<br>JIS SNC M447                    |   | 35CrNiMo6                                       | 38Ch2N2MA                                       |
|  | 18NCD6  | 18NiCrMo7                                   |   | F.1560-14 NiCr-<br>Mo13,<br>F.156   |  |   | 17CrNiMo7                                       |   |
|  | 16NCD13   | 15NiCrMo13                                  |   | F1560-14NiCrMo13,<br>F.1569-14NiCr-<br>Mo131                                      |  |   | 14NiCrMo13                                      |   |
|  | 12C3,<br>15Cr2,<br>18C3                             |   |   |   | SCr 415 (H)                                  |   | 15Cr2   | 15Ch  |
|  | 32C4,<br>34Cr4                                      | 34Cr4(KB)                                   |   | F.8221-35 Cr 4,<br>F.224  | SCr 435 (H)                                  |   | 34Cr4   | 35Ch  |
|  | 42C4,<br>41Cr4                                      | 41Cr4,<br>41Cr4KB                           |   | 38Cr4,<br>38Cr41,<br>42Cr4,<br>F.1202-42Cr4                                       | SCR4,<br>SCr 440 (H)                         |   | 41Cr4   | 40Ch  |
|  | 42C4,<br>42C4TS                                     | 41Cr4                                       | 2245  | F1201,<br>F1202,<br>F1206,<br>F.1202-42Cr4  | SCR4,<br>SCr 440 (H),<br>SCr 440             | 5140,<br>5140H  |   | 40Ch  |
|  | 16MC5,<br>16MC4,<br>16MnCr5                         | 16MnCr5                                     | 2511,<br>2173                                       | F.1515-16 MnCr5,<br>F.151   |  | J 1268 Grade<br>4118H   | 16MnCr5   | 18ChG   |
|  | 55Cr3,<br>55C3                                      | 55Cr3                                       | 2253  | F.1431-55 Cr3,<br>F.143   | SUP 9 (A)                                    |   | 55Cr3   | 50ChGA  |
|  | 25CD4,<br>25CrMo4                                   | 25CrMo4 (KB)                                | 2225  | F8372-AM26CrMo4,<br>F8330-AM25CrMo4,<br>F1256-30CrMo4-1,<br>F.222                 | SCM420,<br>SCM430,<br>SCCrM1                 |   | 25CrMo4   | 20ChM   |
|  | 35CD4,<br>34CrMo4,<br>35CD4 / 34CrMo5               | 34CrMo4KB,<br>35CrMo4,<br>35CrMo4F          | 2234  | F8331-AM34CrMo4,<br>F8231-34CrMo4,<br>F1250-35CrMo4,<br>F1254-35CrMo4DF,<br>F.125 | SCM 432,<br>SCCrM 3,<br>SCM 435 H            | 4135,<br>4137,<br>J 1268 Grade<br>4135H                                     | 34CrMo4   | AS38ChGM  |
| 42CD4TS  | 41CrMo4   |   | F8332-AM42CrMo4,<br>F8232-42CrMo4,<br>F1252-40CrMo4 | SCm 440,<br>JIS SCM 440   |  | 41CrMo4   | 40ChFA  |   |
| 42CD4,<br>42CrMo4  | 38CrMo4KB,<br>42CrMo4,<br>G40CrMo4                  | 2244  | F8332-AM42CrMo4,<br>F8232-42CrMo4,<br>F1252-40CrMo4 | SCM 440 (H),<br>SNB 7,<br>JIS SCM 440   |  | 42CrMo4   |   |   |
| 12CD4  |   |   | F.1551-12CrMo4                                      | SCM 415 (H)   |  |   |   |   |

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Tableau comparatif des matériaux

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|--|---|--|--|--|---|--|--|---|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b>   |   |  |  |  |   |  |  |   |
| <b>P</b>   | P7  | 1.7335   |  | 13 CrMo 4 4  | 13CrMo4-5   |  | 620-440,<br>1503-620-440,<br>1502, 620-470,<br>3606-620,<br>620-540,<br>3604-620-440 |   |
|  | P7 / P10  | 1.7361   |  | 32 CrMo 12   | 32CrMo12  |  | 722M24   | 40B   |
|  | P7  | 1.7380   |  | 10 CrMo 9 10                                       | 10CrMo9-10  |  | 3059-622-490,<br>3606-622,<br>1502-622,<br>3604-622,<br>622Gr.31,<br>622Gr.45        |   |
|  | P7  | 1.7715   |  | 14 MoV 6 3   | 14MoV6-3  |  | 1503-660-460,<br>3604-660  |   |
|  | P7 / P9   | 1.8159   |  | 50 CrV 4   | 51CrV4  |  | 735A50,<br>735A51,<br>735H51,<br>735M50  | 47  |
|  | P7  | 1.8509   |  | 41 CrAlMo 7  | 41CrAlMo7   | Nitraloy 135   | 905M39   | 41B   |
|  | P7 / P10  | 1.8523   |  | 39 CrMoV 13 9                                      | 40CrMoV13-9   |  | 897M39   | 40C   |
| <b>Stainless, acid- and heat-resistant steels / Acciai inossidabili e leghe refrattarie / Aciers inoxydables, antiacides et réfractaires</b> |   |  |  |  |   |  |  |   |
| <b>P</b>   | P14 / P15   | 1.4000   |  | X 7 Cr 13  | X6Cr13  |  | 403S17   |   |
|  | P14   | 1.4001   |  | X 7 Cr 14  | X7Cr14  |  | 403S17   |   |
|  | P14 / P15   | 1.4006   |  | X 10 Cr 13,<br>X 12 Cr 13                          | X12Cr13,<br>X10Cr13   |  | 410S21,<br>410C21,<br>ANC1A  |   |
|  | P14   | 1.4016   |  | X 6 Cr 17  | X6Cr17  |  | 430S15,<br>430S17,<br>430S18   | 60  |
|  | P15   | 1.4027   |  | G-X 20 Cr 14                                       | GX20Cr14  |  | ANC1B,<br>ANC1C,<br>420C24,<br>420C29  |   |
|  | P15   | 1.4034   |  | X 46 Cr 13   | X46Cr13   |  | 420S45   |   |
|  | P15   | 1.4057   |  | X 20 CrNi 17 2                                     | X19CrNi17-2,<br>X17CrNi16-2                                 |  | 431S29,<br>6S80,<br>S80  | 57  |
|  | P14 / P15   | 1.4104   |  | X 12 CrMoS 17                                      | X14CrMoS17  |  |  |   |
|  | P14   | 1.4113   |  | X 6 CrMo 17 1                                      | X6CrMo17-1  |  | 434S17   |   |
|  | P15   | 1.4313   |  | X 4 CrNi 13 4                                      | X3CrNiMo13-4  |  | 425C11,<br>425C12  |   |
|  | P15   | 1.4718   |  | X 45 CrSi 9 3                                      | X45CrSi9-3-1  |  | 401S45   | 52  |
|  | P14   | 1.4724   |  | X 10 CrAl 13,<br>X 10 CrAlSi 13                    | X10CrAlSi13,<br>X10CrAl13                                   |  | 403S17   |   |
|  | P14   | 1.4742   |  | X 10 CrAl 18,<br>X 10 CrAlSi 18                    | X10CrAl18,<br>X10CrAlSi18                                   |  | 430S15   | 60  |
|  | P15   | 1.4747   |  | X 80 CrNiSi 20                                     | X80CrNiSi20   | Siil XB  | 443S65   | 59  |
|  | P14   | 1.4762   |  | X 10 CrAl 24,<br>X 10 CrAlSi 25                    | X10CrAl24,<br>X10CrAlSi25                                   |  |  |   |
| <b>Tool steels / Acciai da utensili / Aciers à outils</b>  |   |  |  |  |   |  |  |   |
| <b>P</b>   | P4  | 1.1545   |  | C 105 W 1  | C105U   |  |  |   |
|  | P4  | 1.1663   |  | C 125 W  | C125W,<br>C125U   |  |  |   |
|  | P7 / H2   | 1.2067   |  | 100 Cr 6   | 99Cr6,<br>102Cr6  |  | BL3,<br>534A99   |   |
|  | P11 / H3  | 1.2080   |  | X 210 Cr 12  | X210Cr12  |  | BD3  |   |

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|--|---|---|--|---|--|--|---|---|--|
| <b>Structural and construction steels / Acciai da costruzione / Aciers de construction</b>   |   |   |  |   |  |  |   |   |  |
| <b>P</b>   | 15CD3.05,<br>15CD4.05                               | 14CrMo3,<br>16CrMo3                         | 2216                                     | F.2631-14CrMo45                                   | SFVA F 12                                    | A387 Grade 12Cl2   | 14CrMo45  | 12ChM   |  |
|  | 30CD12  | 32CrMo12                                    | 2240                                     | F.124.A   |  |  | 32CrMo12  |   |  |
|  | 12CD9.10,<br>10CrMo9-10,<br>10CrMo9-11              | 12CrMo9 (KW KG),<br>G14CrMo9,<br>10         | 2218                                     | TU.H  | SFVAF22A,<br>BSCMV4,<br>SCPH32-CF            | A387 Grade 22,<br>A387 Grade 22Cl2                                       |   | 12Ch8   |  |
|  |   |   |  | F.2621-13 MoCrV6                                  |  |  |   | 13MoCrV6  |  |
|  | 50CV4,<br>51CrV4,<br>50CrV4                         | 50CV4                                       | 2230                                     | F.1430-51CrV4                                     | SUP 10                                       |  | 50CV4   | 50ChGFA   |  |
|  | 40CAD6.12   | 41CrAlMo7                                   | 2940                                     | F.1740-41CrAlMo7                                  | SACM 645,<br>JIS SACM 645                    |  | 41CrAlMo7                                       | 38ChMJuA  |  |
|  |   |   |  |   |  | 39CrMoV13  |   |   |  |
| <b>Stainless, acid- and heat-resistant steels / Acciai inossidabili e leghe refrattarie / Aciers inoxydables, antiacides et réfractaires</b> |   |   |  |   |  |  |   |   |  |
| <b>P</b>   | Z6013,<br>Z6Cr13,<br>Z8C12                          | X6Cr13                                      | 2301                                     | F.3110-X6 Cr13                                    | SUS403,<br>SUS410S,<br>SUS429                |  |   | 08Ch13  |  |
|  | Z3014,<br>Z8C13FF                                   | X6Cr13                                      |  | F.8401-AM-X12<br>Cr13                             | SUS403,<br>SUS410S,<br>SUS429                | 403,<br>410S,<br>429   |   | 08Ch13  |  |
|  | Z12C13,<br>Z12Cr13,<br>Z10C13                       | X12Cr13,<br>X10Cr13                         | 2302                                     | F.3401-X12 Cr13                                   | SUS 410,<br>JIS SUS 410                      | 410  |   | 12Ch13  |  |
|  | Z8C17,<br>Z6Cr17                                    | X8Cr17                                      | 2320                                     | F.3113-X8 Cr17                                    | SUS 430                                      |  |   | 12Ch17  |  |
|  | Z20C13M   |   |  |   | SCS 2  |  |   | 20Ch13L   |  |
|  | Z40C14,<br>Z40Cr14,<br>Z38C13M,<br>Z44C14           | X40Cr14                                     |  | F.3405-X46 Cr13                                   |  |  |   | 40Ch13  |  |
|  | Z15CN16.02  | X16CrNi16                                   | 2321                                     | F.3427-X15 CrNi16,<br>F.313,<br>F.3427-X19CrNi172 | SUS 431,<br>JIS SUS 431                      |  |   | 20Ch17N2  |  |
|  | Z10CF17   | X10CrS17                                    | 2383                                     | F.3117-X10CrS17,<br>F.3413-X14CrMoS17             | SUS 431,<br>SUS430F                          | 430F,<br>J 405 Grade 51435   |   |   |  |
|  | Z8CD17.01   | X8CrMo17                                    | 2325                                     | F.3116-X6CrMo171                                  | SUS 434                                      |  |   |   |  |
|  | Z5CN13.4,<br>Z4CND13.4M,<br>Z6CN13-4,<br>Z8CD17-01  | GX6CrNi13 04                                | 2385                                     |   | SCS 5,<br>SCS 6                              | CA6  |   |   |  |
|  | Z45CS9  | X45CrSi8                                    |  | F.3220-X 4 ScrSi<br>09-03                         | SUH 1  | HNV3   |   | 40Ch9S2   |  |
|  | Z10C13,<br>Z13C13                                   | X10CrAl12                                   |  | F.13152-X 10 CrAl13                               |  | 405  |   | 10Ch13SJ  |  |
|  | Z10CAS18,<br>Z12CAS18                               | X8Cr17                                      |  | F.3153-X 10 CrAl 18                               | SUH 21                                       | 430  |   | 15Ch18SJ  |  |
|  | Z80CSN20.02   |   |  | F.3222-X<br>80CrSiNi20-02                         | SUH 4  | HNV6   |   |   |  |
|  | Z10CAS24,<br>Z12CAS25                               | X16Cr26                                     | 2322                                     | F.3154-X 10 CrAl24                                | SUH 446                                      | 446  |   |   |  |
| <b>Tool steels / Acciai da utensili / Aciers à outils</b>  |   |   |  |   |  |  |   |   |  |
| <b>P</b>   | C105E2U,<br>Y1105                                   | C100KU                                      | 1880                                     | F515,<br>F516                                     | SK 3 (TC105)                                 | W110   |   | U10A-1  |  |
|  | Y2120   |   |  | F.5123 C120                                       |  | W112   |   | U13-1   |  |
|  | 100Cr6RR,<br>100C6,<br>Y100C6                       |   | 2258                                     | F.5230 100 Cr6,<br>F.1310 - 100 Cr6,<br>F.131     | SUJ 2,<br>SUJ 4                              | L3,<br>52100,<br>L1  |   | Ch  |  |
|  | X200Cr12,<br>Z200C12                                | X205Cr12KU                                  |  | F.5212 X210 Cr12                                  | SKD 1,<br>SKS                                | D3   |   | Ch12  |  |



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| ISO   | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN EN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S. | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|---|---|--|--|---|---|--|---|---|
| <b>Tool steels / Acciai da utensili / Aciers à outils</b>   |   |  |  |   |   |  |   |   |
| <b>P</b>  | P11 / H1  | 1.2344   |  | X 40 CrMoV 5 1  | X40CrMoV5-1   |  | BH13  |   |
|   | P11 / H3  | 1.2363   |  | X 100 CrMoV 5 1                                       | X100CrMoV5-1  |  | BA2   |   |
|   | P7 / H2   | 1.2419   |  | 105 WCr 6   | 107WCr5,<br>105WCr6,<br>100WCr6                             |  |   |   |
|   | P14 / H3  | 1.2436   |  | X 210 CrW 12  | X210CrW12-1,<br>X210CrW12                                   |  |   |   |
|   | P7 / H2   | 1.2542   |  | 45 WCrV 7   | 45WCrV8,<br>45WCrV7   |  | BS1   |   |
|   | P11 / P13   | 1.2581   |  | X 30 WCrV 9 3   | X30WCrV9-3  |  | BH21  |   |
|   | P14 / H3  | 1.2601   |  | X 165 CrMoV 12  | X165CrMoV12   |  |   |   |
|   | P7 / P10 / H1   | 1.2713   |  | 55 NiCrMoV 6  | 55NiCrMoV6  |  | BH224   |   |
|   | P7 / H3   | 1.2833   |  | 100 V 1   | 100V1   |  | BW2   |   |
|   | P11 / H3  | 1.3243   |  | S 6-5-2-5   | HS6-5-2-5   |  | BM35  |   |
|   | P11 / H3  | 1.3255   |  | S 18-1-2-5  | HS18-1-2-5  |  | BT4   |   |
|   | P11 / H3  | 1.3343   |  | S 6-5-2   | HS6-5-2   |  | BM2   |   |
|   | P11 / H3  | 1.3348   |  | S 2-9-2   | HS2-9-2   |  |   |   |
|   | P11 / H3  | 1.3355   |  | S 18-0-1  | HS18-0-1  |  | BT1   |   |
| <b>Stainless and heat-resistant steel / Acciaio inossidabile e resistente al calore / Acier inoxydable et réfractaire</b> |   |  |  |   |   |  |   |   |
| <b>M</b>  | M1  | 1.4301   |  | X 5 CrNi 18 10  | X5CrNi18-10   |  | 304S15,<br>304S16,<br>304S31,<br>304S11,<br>304S17,<br>LW21,<br>LWCF21  | 58E   |
|   | M1  | 1.4305   |  | X 10 CrNiS 18 9                                       | X8CrNiS18-9   |  | 303S21,<br>303S22,<br>303S31  | 58M   |
|   | M1  | 1.4306   |  | X 2 CrNi 19 11  | X2CrNi19-11   |  | 304S11,<br>LW20,<br>LWCF20,<br>S536, T74,<br>304C12 (LT196),<br>305S11  |   |
|   | M1  | 1.4308   |  | G-X 6 CrNi 18 9                                       | GX5CrNi19-10  |  | 304C15,<br>304C15 (LT196)   |   |
|   | M2  | 1.4310   |  | X 12 CrNi 17 7  | X9CrNi18-8,<br>X10CrNi18-8                                  |  | 301S21,<br>301S22,<br>302S26  |   |
|   | M1  | 1.4311   |  | X 2 CrNiN 18 10                                       | X2CrNiN18-10  |  | 304S62  |   |
|   | M1  | 1.4401   |  | X 5 CrNiMo 17 12 2                                    | X5CrNiMo17-12-2,<br>X4CrNiMo17-12-2,<br>X5CrNiMo18-10       |  | 316S13,<br>316S17,<br>316S19,<br>316S31,<br>316S33,<br>316S16           |   |

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# Material comparison table

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Tableau comparatif des matériaux

| ISO   | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR  | Italy – UNI<br>Italia – UNI<br>Italia – UNI  | Sweden – SS<br>Svezia – SS<br>Svède –SS | Spain – UNE<br>Spagna –UNE<br>España – UNE   | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis –<br>AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|---|--|--|---|--|--|---|---|---|
| <b>Tool steels / Acciai da utensili / Aciers à outils</b>   |  |  |   |  |  |   |   |   |
| <b>P</b>  | X40CrMoV5,<br>Z40CDV5  | X40CrMoV511KU                                | 2242                                    | F.5318 X40 CrMoV5  | SKD 61                                       | H13   |   | 4Ch5MF1S  |
|   | X100CrMoV5,<br>Z100CDV5  | X100CrMoV51KU                                | 2260                                    | F.5227 X100<br>CrMoV5  | SKD 12,<br>JIS SKD 12                        | A2  |   |   |
|   | 105WC13  | 107WCr5KU                                    | 2140                                    | F.5233 105 WCr5,<br>F.523  | SKS 2,<br>SKS 3,<br>SKS 31                   |   |   |   |
|   | X210CrW12-1,<br>Z210CW12-01,<br>Z 210 CW 12  | X215CrW121KU                                 | 2312                                    | F.5213 X210 CrW12,<br>F.521  |  | D6  |   |   |
|   | 45WCrV8,<br>45WCrV20   | 45WCrV8KU                                    | 2710                                    | F.5241 45 WCrSi 8,<br>F.524,<br>F.524145WCrSi 8  |  | S1  |   | 5ChW2SF   |
|   | X30WCrV9,<br>Z30WCV9   | X30WCrV93KU                                  |   | F.5323 X30 WCrV9   | SKD 5  | H21   |   | 3Ch2W8F   |
|   |  | X165CrMoW12KU                                | 2310                                    | F.5211 X160<br>CrMoV12   |  |   |   |   |
|   |  |  |   | F.528,<br>F.520S   |  | L6  |   | 5ChNM   |
|   | C105E2UV1,<br>Y1105V,<br>100V2   | 102V2KU                                      |   |  | SKS 43                                       | W210  |   |   |
|   | Z85WDCV06- 05-<br>05-04-02,<br>Z90WDCV06- 05-<br>05-04-02  | HS6-5-2-5                                    | 2723                                    | F.5613 6-5-2-5   | SKH 55                                       | M35   |   | R6M5K5  |
|   | Z80WKC18- 05-<br>04-01   | HS18-1-1-5                                   |   | F.5530 18-1-1-5  | SKH 3  | T4  |   |   |
|   | Z85WDCV06- 05-<br>04-02  | HS6-5-2-5                                    | 2722                                    | F.5603 6-5-2   | SKH 51                                       | M2  |   | R6M5  |
|   | Z100DCWV09- 04-<br>02-02   | HS2-9-2                                      | 2782                                    | F.5607 2-9-2   |  | M7  |   |   |
| Z80WCV18-04-01  | HS18-0-1   |  | F.5520 18-0-1                           | SKH 2  | T1   |   | R18   |   |
| <b>Stainless and heat-resistant steel / Acciaio inossidabile e resistente al calore / Acier inoxydable et réfractaire</b> |  |  |   |  |  |   |   |   |
| <b>M</b>  | Z4CN19-10FF,<br>Z5CN17-08,<br>Z6CN18-09,<br>Z7CN18-09  | X5CrNi18 10                                  | 2332,<br>233                            | F.3451-X5 CrNi18-<br>10, F.314,<br>F.3504-X6CrNi19<br>10,<br>F3504-X5CrNi1810              | SUS 304                                      | 304,<br>304H  |   | 08Ch18N10                                       |
|   | Z10CNF18.09,<br>Z8CNF18-09   | X10CrNiS18 09                                | 2346                                    | F.3508-<br>X10CrNiS18-09   | SUS 303,<br>JIS SUS 303                      | J 405 Grade 30303   |   |   |
|   | Z1CN18-12,<br>Z2CN18-10,<br>Z3CN19.10M,<br>Z3CN18-10,<br>Z3CN19-11,<br>Z3CN19-11FF                 | X3CrNi18 11,<br>X2CrNi18 11,<br>GX2CrNi19 10 | 2352                                    | F.3503-X 2CrNi19-<br>10,<br>F3503-X 2CrNi18-<br>10   | JIS SCS 19,<br>JIS SUS 304L                  |   |   | 03Ch18N11                                       |
|   | Z6CN18.10M   |  |   |  | SCS 13                                       |   |   | 07Ch18N9L                                       |
|   | Z12CN17.07,<br>Z12CN18.07,<br>Z11CN17-08,<br>Z11CN18-08,<br>Z12CN18-09                             | X12CrNi17 07                                 | 2331                                    | F.3517-X12CrNi17<br>07   | SUS 301                                      | 301   |   |   |
|   | Z3CN18-07Az,<br>Z3CN18-10AZ  | X2CrNiN18 11                                 | 2371                                    | F3541-<br>X2CrNiN1810  | SUS 304 LN                                   | 304LN   |   |   |
|   | Z6CND17.11,<br>Z3CD17-11-01,<br>Z6CND17-11,<br>Z6CND17-11-02FF,<br>Z7CND17-11-02,<br>Z7CND17-12-02 | X5CrNiMo17 12                                | 2347                                    | F.3543-X5CrNi-<br>Mo17-12,<br>F.3543-X6 CrNi-<br>Mo17- 12-03,<br>F3543-X5CrNi-<br>Mo17-122 | SUS 316                                      | 316   |   |   |

# Material comparison table

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Tableau comparatif des matériaux

| ISO   | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S. | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|---|---|--|--|--|---|--|---|---|
| <b>Stainless and heat-resistant steel / Acciaio inossidabile e resistente al calore / Acier inoxydable et réfractaire</b> |   |  |  |  |   |  |   |   |
| <b>M</b>  | M1  | 1.4408   |  | G-X 6 CrNiMo 18 10                                 | GX5CrNiMo19-11-2  |  | 316C16,<br>316C16 (LT196),<br>ANC4B                                     |   |
|   | M1  | 1.4429   |  | X 2 CrNiMoN 17<br>13 3                             | X2CrNiMoN17-13-3  |  | 316S62,<br>316S63   |   |
|   | M1  | 1.4435   |  | X 2 CrNiMo 18 14 3,<br>X 2 CrNiMo 18 12            | X2CrNiMo18-14-3   |  | 316S11, 316S13,<br>316S14, 316S31,<br>LW22, LWCF22,<br>316S12           |   |
|   | M1  | 1.4438   |  | X 2 CrNiMo 18 16 4                                 | X2CrNiMo18-15-4   |  | 317S12  |   |
|   | M1  | 1.4460   |  | X 4 CrNiMoN 27 5 2                                 | X3CrNiMoN27-5-2   |  |   |   |
|   | M1  | 1.4541   |  | X 6 CrNiTi 18 10                                   | X6CrNiTi18-10   |  | 321S12,<br>321S31,<br>321S51<br>(1010, 1105),<br>LW24,<br>LWCF24        | 58B,<br>58C   |
|   | M1  | 1.4550   |  | X 6 CrNiNb 18 10                                   | X6CrNiNb18-10   |  | 347S20,<br>347S31,<br>347S51,<br>ANC3B                                  | 58F,<br>58G   |
|   | M1  | 1.4571   |  | X 6 CrNiMoTi 17<br>12 2                            | X6CrNiMoTi17-12-2   |  | 320S31,<br>320S17,<br>320S18  | 58J   |
|   | M1  | 1.4581   |  | G-X 5 CrNiMnNb<br>18 10                            | GX5CrNiM-<br>oNb19-11-2                                     |  | 318C17,<br>ANC4C  |   |
|   | M1  | 1.4583   |  | X 10 CrNiMoNb<br>18 12                             | X10CrNiMoNb18-12  |  |   |   |
|   | M1  | 1.4828   |  | X 15 CrNiSi 20 12                                  | X15CrNiSi20-12  |  | 309S24  |   |
|   | M2  | 1.4871   |  | X 53 CrMnNiN 21 9                                  | X53CrMnNiN21-9  |  | 349S54  |   |
|   | M1  | 1.4878   |  | X 12 CrNiTi 18 9                                   | X12CrNiTi18-9,<br>X10CrNiTi18-10                            |  | 321S20,<br>321S51   | 58B,<br>58C   |
| <b>Heat-resistant iron-based alloy / Leghe refrattarie a base di ferro / Alliage réfractaire base Fe</b>                  |   |  |  |  |   |  |   |   |
| <b>M</b>  | M1  | 1.4558   |  | X 2 NiCrAlTi 32 20                                 | X2NiCrAlTi32-20   |  |   |   |
|   | M1  | 1.4563   |  | X 1 NiCrMoCu 31<br>27 4                            | X1NiCr-<br>MoCu31-27-4                                      |  |   |   |
|   | M1  | 1.4864   |  | X 12 NiCrSi 36 16                                  | X12NiCrSi36-16,<br>X12NiCrSi35-16                           | Incoloy DS   | NA17  |   |
|   | M1  | 1.4958   |  | X 5 NiCrAlTi31-20                                  | X5NiCrAlTi31-20   |  |   |   |
|   | M1  | 1.4977   |  |  | X 40 CoCrNi 20 20   |  |   |   |
|   | M1  | 1.4845   |  | X12CrNi25-21                                       |   |  | 310S16  |   |
| <b>Grey cast iron / Ghisa grigia / Fonte grise</b>  |   |  |  |  |   |  |   |   |
| <b>K</b>  | K3  | 0.6010   | EN-JL1010  | GG-10,<br>GG 10                                    | EN-GJL-100  |  |   |   |
|   | K3  | 0.6015   | EN-JL1020  | GG-15,<br>GG 15                                    | EN-GJL-150  |  | Grade 150   |   |
|   | K3  | 0.6020   | EN-JL1030  | GG-20,<br>GG 20                                    | EN-GJL-200  |  | Grade 220   |   |
|   | K3  | 0.6025   | EN-JL1040  | GG-25,<br>GG 25                                    | EN-GJL-250  |  | Grade 260   |   |
|   | K4  | 0.6030   | EN-JL1050  | GG-30,<br>GG 30                                    | EN-GJL-300  |  | Grade 300   |   |
|   | K4  | 0.6035   | EN-JL1060  | GG-35,<br>GG 35                                    | EN-GJL-350  |  | Grade 350   |   |
|   | K4  | 0.6040   |  | GG-40,<br>GG 40                                    | EN-GJL-400  |  | Grade 400   |   |
|   | K4  | 0.6660   |  | GGL-NiCr 20 2                                      |   |  | L-NiCr20 2  |   |
|   | K4  |  |  | GG-26Cr,<br>GG 26Cr                                | EN-GJL-260 Cr   |  |   |   |
|   | K7  |  |  | GGV 45   | EN-GJV-450  |  |   |   |

# Material comparison table

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Tableau comparatif des matériaux

| ISO   | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR | Italy – UNI<br>Italia – UNI<br>Italia – UNI | Sweden – SS<br>Svezia – SS<br>Svède –SS | Spain – UNE<br>Spagna –UNE<br>Espanya – UNE  | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis –<br>AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|---|---|---|---|--|--|---|---|---|
| <b>Stainless and heat-resistant steel / Acciaio inossidabile e resistente al calore / Acier inoxydable et réfractaire</b> |   |   |   |  |  |   |   |   |
| <b>M</b>  |   |   |   | F.8414-AM-X7<br>CrNiMo20 10  | SCS 14                                       |   |   | 07Ch18N10G2S2M2L                                |
|   | Z2CND17.13Az  | X2CrNiMoN17 13                              | 2375                                    | F3543- X2CrNi-<br>MoN17133   | SUS 316 LN                                   | 316LN   |   |   |
|   | Z2CND17.13,<br>Z3CND17-12-03,<br>Z3CND18-14-03      | X2CrNiMo17 13                               | 2353                                    | F.3533-X2 CrNiMo<br>17-12-03,<br>F.3534-X6 CrNiMo<br>17-12-03  |  | 316L  |   | 03Ch17N14M3                                     |
|   | Z2CND19.15,<br>Z2CND19-15-04,<br>Z3CND19-15-04      | X2CrNiMo18 16                               | 2367                                    | F3539-X2CrNi-<br>Mo18164   | SUS 317 L                                    | 317L  |   |   |
|   | Z3CND25-07Az,<br>Z5CND27-05Az                       |   | 2324                                    | F3309-X8CrNi-<br>Mo27-05,<br>F3552-X8CrNi-<br>Mo266  | SUS 329 J1                                   |   |   |   |
|   | Z6CNT18.10  | X6CrNiTi18 11                               | 2337                                    | F.3553-X7 CrNiTi<br>18-11,<br>F.3523-X 6 CrNi-<br>Ti18-11,<br>09 Ch 18N10T,<br>F3523-X6CrNi-<br>Ti1810 | SUS 321,<br>JIS SUS 321                      |   |   | 06Ch18N10T                                      |
|   | Z6CNNb18.10   | X6CrNiNb18 11,<br>X8CrNiNb18 11             | 2338                                    | F.3552-X 7 CrN-<br>iNb18-11,<br>F.3524-X 67 CrN-<br>iNb18-11,<br>F3524-X6CrN-<br>iNb1810               | SUS 347                                      |   |   | 08Ch18N12B                                      |
|   | Z6CNDT17.12   | X6CrNiMoTi17 12                             | 2350                                    | F.3552-X 6 CrNiMo-<br>Ti17-12-03,<br>F3535- X6CrNiMo-<br>Ti17122                                       | SUS 316 Ti                                   | 316Ti,<br>326Ti   |   | 10Ch17N13M2T                                    |
|   | Z4CNDNb18.12M                                       | GX6CrNiMoNb20 11                            |   |  | SCS 22                                       |   |   |   |
|   |   | X6CrNiMoNb17 13                             |   |  |  |   |   |   |
| Z15CNS20.12,<br>Z17CNS20-12,<br>Z9CN24-13   | X16CrNi23 14  |   | F3312-X15CrNi-<br>Si20-12               | SUH 309  | 309  |   | 20Ch20N14S2                                     |   |
| Z52CMN21.09,<br>Z53CMNS21-09Az,<br>Z53CMN21-09Az  | X53CrMnNiN21 9                                      |   | F.3217-X53 CrMn-<br>NiN 21-09           | SUH 35,<br>SUH 36  | EV8  |   | 55Ch20G9AN4                                     |   |
| T6CNT18.12 (B),<br>Z6CNT18-10   |   | 2337  | F.3523-X 6CrNiTi<br>18 11               | SUS 321  | 321  |   |   |   |
| <b>Heat-resistant iron-based alloy / Leghe refrattarie a base di ferro / Alliage réfractaire base Fe</b>                  |   |   |   |  |  |   |   |   |
| <b>M</b>  |   |   |   |  |  |   |   |   |
|   | Z12NCS37.18,<br>Z12NCS35.16,<br>Z20NCS33-16         |   |   | F.3313-X12 CrNi<br>36-16   | SUH 330                                      |   |   |   |
|   | Z 42 CNKDWNb  |   |   |  |  |   |   |   |
| Z8CN25-20   | X6CrNi2521  | 2361  |   | SUH310   | 310S   |   | 20Ch23N18                                       |   |
| <b>Grey cast iron / Ghisa grigia / Fonte grise</b>  |   |   |   |  |  |   |   |   |
| <b>K</b>  | Ft10D,<br>FGL100                                    | G10   | 110                                     | FG 10  | FC 100,<br>FC10                              |   |   | Sc10  |
|   | Ft15D,<br>FGL150                                    | G15   | 115                                     | FG 15  | FC 150                                       |   |   | Sc15  |
|   | Ft20D,<br>FGL200                                    | G20   | 120                                     | FG 20  | FC 200,<br>FC20                              |   |   | Sc20  |
|   | Ft25D,<br>FGL250                                    | G25   | 125                                     | FG 25  | FC25,<br>FC 250                              |   |   | Sc25  |
|   | Ft30D,<br>FGL300                                    | G30   | 130                                     | FG 30  | FC 300                                       |   |   | Sc30  |
|   | Ft35D,<br>FGL350                                    | G35   | 135                                     | FG 35  | FC 350                                       |   |   | Sc35  |
|   | Ft40D,<br>FGL400                                    |   | 140                                     |  |  |   |   | Sc40  |
|   | L-NC 20 2   |   | 523                                     |  |  |   |   |   |

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| ISO   | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage         | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S. | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|---|---|--|--|--|---|--|---|---|
| <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |   |  |  |  |   |  |   |   |
| <b>K</b>  | K5  | 0.7040   | EN-JS1030  | GGG-40   | EN-GJS-400-15   |  | 420 / 12  |   |
|   | K6  | 0.7050   | EN-JS1050  | GGG-50   | EN-GJS-500-7  |  | 500 / 7   |   |
|   | K6  | 0.7060   | EN-JS1060,<br>EN-JS 1092   | GGG-60   | EN-GJS-600-3,<br>EN-GJS-600-3U                              |  | 600 / 3   |   |
|   | K6  | 0.7070   | EN-JS1070,<br>EN-JS 1102   | GGG-70   | EN-GJS-700-2,<br>EN-GJS-700-2U                              |  | 700 / 2   |   |
| <b>Malleable iron / Ghisa malleabile / Fonte malléable</b>                            |   |  |  |  |   |  |   |   |
| <b>K</b>  | K1  | 0.8035   | EN-JM 1010   | GTW-35,<br>GTW-35-04                               | GTW-35-04,<br>EN-GJMW-350-4                                 |  | W 35-04   |   |
|   | K1  | 0.8040   | EN-JM 1030   | GTW-40-05,<br>GTW-40                               | EN-GJMW-400-5,<br>GTW-40-05                                 |  | W 410 / 4   |   |
|   | K1  | 0.8045   | EN-JM 1040   | GTW-45-07,<br>GTW-45                               | EN-GJMW-450-7   |  | 45-07   |   |
|   | K1  | 0.8135   | EN-JM 1130   | GTS-35-10,<br>GTS-35                               | EN-GJMB 350-10  |  | B 340 / 12  |   |
|   | K1  | 0.8145   | EN-JM 1140   | GTS-45-06,<br>GTS-45                               | EN-GJMB 450-6,<br>GTS-45-06                                 |  | P 440 / 7,<br>P 45-06   |   |
|   | K1  | 0.8155   | EN-JM 1160   | GTS-55-04,<br>GTS-55                               | EN-GJMB 550-4,<br>GTS-55-04                                 |  | P 540 / 5,<br>P 55-04   |   |
|   | K2  | 0.8165   | EN-JM 1180   | GTS 65-02,<br>GTS-65                               | EN-GJMB 650-2,<br>GTS-65-02                                 |  | P 65-02   |   |
|   | K2  | 0.8170   | EN-JM 1190   | GTS 70-02,<br>GTS-70                               | EN-GJMB 700-2,<br>GTS-70-02                                 |  | P 70-02   |   |
|   | K5  | 0.7043   | EN-JS 1020   | GGG-40.3   | EN-GJS-400-18   |  | 370/17  |   |
| <b>Aluminium alloy / Leghe di alluminio / Alliage d'aluminium</b>                     |   |  |  |  |   |  |   |   |
| <b>N</b>  | N1  | 3.0255   | EN AW-1050A  | Al99.5   | Al99.5  |  | 1B  |   |
|   | N4  | 3.1371   | EN AC-21000  | G-AlCu4TiMg  | G-AlCu4TiMg   |  |   |   |
|   | N2  | 3.1655   | EN AW-2011   | AlCu6BiPb  | AlCu6BiPb   |  | FC1   |   |
|   | N2  | 3.1734   |  | Y alloy  | AlCu4Mg1.5Ni2,<br>WL 3.1734                                 |  | LM14  |   |
|   | N4  | 3.2371   | EN AC-42100  | G-AISI7Mg  | G-AISI7Mg,<br>AISI7Mg                                       |  | 2L99,<br>LM25   |   |
|   | N4  | 3.2373   | EN AC-43300  | G-AISI9Mg  | G-AISI9Mg,<br>AISI9Mg                                       |  |   |   |
|   | N4  | 3.2381   | EN AC-43000  | G-AISI10Mg   | G-AISI10Mg,<br>AISI10Mg                                     |  | LM9   |   |
|   | N4  | 3.2382   | EN AC-43400  | GD-AISI10Mg  | AISI10Mg(Fe)  |  | LM9   |   |
|   | N4  | 3.2383   | EN AC-43200  | G-AISI10MgCu                                       | G-AISI10MgCu,<br>AISI10Mg (Cu)                              |  |   |   |
|   | N3  | 3.2581   | EN AC-44200  | G-AISI12   | G-AISI12,<br>AISI12   |  | LM6   |   |
|   | N3  | 3.2582   | EN AC-44300  | GD-AISI12  | GD-AISI12,<br>AISI12 (Fe)                                   |  | LM6,<br>LM20  |   |
|   | N3  | 3.2583   | EN AC-47000  | G-AISI12 (Cu)                                      | G-AISI12 (Cu)   |  | LM20  |   |
|   | N2  | 3.3315   | EN AW-5005A  | AlMg1  | AlMg1C  |  | N41   |   |
|   | N3  | 3.3561   | EN AC-51300  | G-AlMg5  | G-AlMg5   |  | N6,<br>LM5  |   |
|   | N2  | 3.4345   | EN AW-7022   | AlZnMgCu0.5  | AlZnMgCu0.5   |  |   |   |
|   | <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |  |  |  |   |  |   |   |
| <b>N</b>  | N7  | 2.0240   | CW502L   | CuZn15   | CuZn15  | Medium red tombak,<br>Gold tombak  | CZ 102  |   |
|   | N7  | 2.0265   | CW505L   | CuZn30   | CuZn30  | Half tombak,<br>Soldered brass,<br>Cartridge brass,<br>Polished copper<br>Metarsic                             | CZ 106  |   |
|   | N7  | 2.0321   | CW508L   | CuZn37   | CuZn37  | Pressed brass,<br>Etching quality,<br>Tuned brass,<br>Soft brass,<br>Stamped brass                             | CZ 108  |   |
|   | N7  | 2.0592   | CC765S   | G-CuZn35Al1,<br>GK-CuZn35Al1,<br>GZ-CuZn35Al1      | CuZn-<br>35Mn2Al1Fe1-C                                      |  | HTB 1   |   |

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| ISO   | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR | Italy – UNI<br>Italia – UNI<br>Italia – UNI | Sweden – SS<br>Svezia – SS<br>Süède – SS | Spain – UNE<br>Spagna – UNE<br>España – UNE | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis – AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|---|---|---|--|---|--|--|---|---|
| <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |   |   |  |   |  |  |   |   |
| <b>K</b>  | FGS 400-12  | GS400-12                                    | 717                                      |   | FCD 400,<br>FCD40                            |  |   | VC42-12   |
|   | FGS 500-7   | GS500-7                                     | 727                                      |   | FCD 500,<br>FCD50                            |  |   | VC50-2  |
|   | FGS 600-3   | GS600-3                                     | 732                                      |   | FCD 600,<br>FCD60                            |  |   | VC60-2  |
|   | FGS 700-2   | GS700-2                                     | 737                                      |   | FCD 700,<br>FCD70                            |  |   | VC70-2  |
| <b>Malleable iron / Ghisa malleabile / Fonte malléable</b>                            |   |   |  |   |  |  |   |   |
| <b>K</b>  | MB 35-7   |   |  |   | FCMW 330                                     |  |   |   |
|   | MB 40-10  |   |  |   | FCMW 350                                     |  |   |   |
|   | MB 45-7   |   |  |   | FCMWP 440                                    |  |   |   |
|   | MN 35-10  |   | 815                                      |   | FCMB 340                                     |  |   |   |
|   | MP 50-5   |   | 854                                      |   |  |  |   |   |
|   | MP 60-3   |   | 856                                      |   |  |  |   |   |
|   |   |   | 862                                      |   |  |  |   |   |
|   | MP 70-2   |   | 862                                      |   |  |  |   |   |
|   | FGS370-17   | GS042/15                                    | 0717-15                                  |   |  |  |   | VC42-12   |
| <b>Aluminium alloy / Leghe di alluminio / Alliage d'aluminium</b>                     |   |   |  |   |  |  |   |   |
| <b>N</b>  | A5  | 4507  | 4007                                     | L-3051                                      | A1x1,<br>A1050                               | 1050A  |   |   |
|   | A-U5GT  |   |  | L-2140                                      | AC1B   |  |   |   |
|   | A-U5PbBi  | 6362  | 4355                                     | L-3182                                      | A2011  |  |   |   |
|   | A-U4NT  | 3045  |  | L-2150                                      | AC5A   |  |   |   |
|   | A-S7G0.3  | 7257  | 4244                                     | L-2651                                      | AC4C,<br>JIS AC4 CH (AL 9)                   |  |   |   |
|   | A7-S10G   | 3051  | 4253                                     |   | AC4A,<br>JIS AC4 A (AL 4)                    |  |   |   |
|   | A-S10G  | 3051  | 4253                                     | L-2560,<br>L-2561                           | JIS AC4 A (AL 4V)                            |  |   |   |
|   | A-S10G  | 3051  | 4253                                     | L-2560,<br>L-2561                           | AC4A   |  |   |   |
|   | A-S9GU  |   |  |   | JIS ADC3 (AL 4)                              |  |   |   |
|   | A-S13   | 4514  | 4261                                     | L-2520,<br>L-2521                           | AC3A   |  |   |   |
|   | A-S13,<br>A-S12                                     | 4514,<br>G-AISI13                           | 4261                                     | L-2520,<br>21                               | AC3A   |  |   |   |
|   | A-S12U  | 3048  | 4260                                     | L-2530                                      | ADC1 (AK 12),<br>AC3A (AL 12)                | 413.1  |   |   |
|   | A-G0,<br>6  | 5764  | 4106                                     | L-3350                                      | A2x8,<br>A5005                               | 5005A  |   |   |
|   | A-G6  | 3058  | 4146                                     | L-3320                                      | JIS AC7A (AL28)                              | 5056A,<br>514.1  |   |   |
|   | A-Z5GU0.6   |   |  |   |  |  |   |   |
| <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |   |   |  |   |  |  |   |   |
| <b>N</b>  | CuZn15  |   |  |   | C2300  |  |   |   |
|   | CuZn30  |   |  |   | C2600  |  |   |   |
|   | CuZn37  |   |  |   | C2720  |  |   |   |

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|---|---|--|--|--|---|--|---|---|
| <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |   |  |  |  |   |  |   |   |
| N   | N7  | 2.0596   | CC764S   | G-CuZn34Al2,<br>GK-CuZn34Al2,<br>GZ-CuZn34Al2      | CuZn-<br>34Mn3Al2Fe1-C                                      |  |   |   |
|   | N7  | 2.0966   | CW307G   | CuAl10Ni5Fe4                                       | CuAl10Ni5Fe4  |  | CA 104  |   |
|   | N7  | 2.0975   | CC333G   | G-CuAl11Ni,<br>G-CuAl10Ni                          | G-CuAl11Ni  |  | AB2   |   |
|   | N7  | 2.1050   | CC480K   | G-CuSn10Zn   | CuSn10-C  |  | G1,<br>CT1  |   |
|   | N7  | 2.1052   | CC483K   | G-CuSn12,<br>GZ-CuSn12,<br>GC-CuSn12               | CuSn12-C  |  | Pb2   |   |
|   | N9  | 2.1090   | CC493K   | G-CuSn7ZnPb,<br>GZ-CuSn7ZnPb,<br>GC-CuSn7ZnPb      | CuSn7Zn4Pb7-C   | Gunmetal 7   |   |   |
|   | N9  | 2.1096   | CC491K   | G-CuSn5ZnPb  | CuSn5Zn5Pb5-C   | Gunmetal 5   | LG2   |   |
|   | N9  | 2.1098   | CC490K   | G-CuSn2ZnPb  | CuSn3Zn8Pb5-C   | Alloy 5A   | LG1   |   |
|   | N9  | 2.1176   | CC495K   | G-CuPb10Sn,<br>GZ-CuPb10Sn,<br>GC-CuPb10Sn         | CuSn10Pb10-C  |  | LB2   |   |
|   | N9  | 2.1182   | CC496K   | G-CuPb15Sn,<br>GZ-CuPb15Sn,<br>GC-CuPb15Sn         | CuSn7Pb15-C   |  | LB1   |   |
|   | N9  | 2.1188   | CC497K   | G-CuPb20Sn   | CuSn5Pb20-C   |  | LB5   |   |
|   | N7  | 2.1293   | CW106C   | CuCrZr   | CuCr1Zr   |  | CC 102  |   |
|   | N7  |  |  | CuAl6.5Fe2.5Sn0.25                                 |   | AMPCO 8  |   |   |
|   | N7  |  |  |  |   | AMPCO 6  |   |   |
|   | N10   |  |  | CuAl13Fe4.5  |   | AMPCO 21   |   |   |
| N10   |   |  |  |  | AMPCO 26  |  |   |   |
| <b>Magnesium alloy / Lega di magnesio / Alliage de magnésium</b>                      |   |  |  |  |   |  |   |   |
| N   | N6  | 3.5101   | EN-MC35110   | G-MgZn 4 SE 1 Zr 1                                 | EN-MCMgZn4RE1Zr,<br>G-MgZn4SE1Zr1                           |  | RZ5, MAG5,<br>MAG9, TZ6   |   |
|   | N6  | 3.5103   | EN-MC65120   | G-MgSE 3 Zn 2 Zr 1                                 | EN-MCMgRE3Zn2Zr,<br>G-MgSE3Zn2Zr1                           |  | ZRE1, MAG6  |   |
|   | N6  | 3.5106   | EN-MC65210   | G-MgAg 3 SE 2 Zr 1                                 | EN-MCMgRE2Ag2Zr,<br>G-MgAg3SE2Zr1                           |  | MSR, QE22   |   |
|   | N6  | 3.5161   |  | MgZn6Zr,<br>MgZn 6 Zr F 29                         | MgZn6Zr,<br>MgZn6Zr F29                                     |  | ZW1, ZW3, ZW6,<br>ZW21, MAG 161,<br>MAG 131, MAG 141,<br>MAG 151        |   |
|   | N6  | 3.5200   |  | MgMn2  | MgMn2   |  | MAG 101,<br>AM503   |   |
|   | N6  | 3.5312   |  | MgAl3Zn  | MgAl3Zn   |  | AZ31,<br>MAG 111  |   |
|   | N6  | 3.5470   | EN-MC21320   | MgAl4Si1   | EN-MCMgAl4Si  |  |   |   |
|   | N6  | 3.5612   |  | MgAl6Zn  | MgAl6Zn   |  | MAG121, AZM   |   |
|   | N6  | 3.5632   | EN-MC21150   | G-MgAl 6 Zn 3                                      | G-MgAl6Zn3  | AZ63   |   |   |
|   | N6  | 3.5662   |  | G-MgAl 6   | G-MgAl6   |  |   |   |
|   | N6  | 3.5812   | EN-MC21110   | G-MgAl 8 Zn 1                                      | G-MgAl8Zn1  | AZ81 hp  | MAG1, MAG2,<br>AZ80, AZ81, A8   |   |
|   | N6  | 3.5912   | EN-MC21120   | GD-MgAl 9 Zn 1                                     | GD-MgAl9Zn1   | AZ91   | AZ91, MAG3, MAG7  |   |
|   | <b>Duroplast / Plastiche duret / Duroplast</b>                                |  |  |  |   |  |   |   |
| N   | N12   |  |  |  |   | EP, Epoxide, Epoxy   |   |   |
|   | N12   |  |  |  |   | Bakelite   |   |   |
|   | N12   |  |  |  |   | Pertinax   |   |   |
|   | N12   |  |  |  |   | Resitex  |   |   |
| <b>Thermoplastic / Termoplastiche / Thermoplastique</b>                               |   |  |  |  |   |  |   |   |
| N   | N11   |  |  |  |   | PMMA, Polyme-<br>thylmetacrylate,<br>Plexiglass, Acrylic<br>glass  |   |   |
|   | N11   |  |  |  |   | PC, Polycarbonate,<br>Makrolon   |   |   |
|   | N11   |  |  |  |   | PA, Polyacrylamide   |   |   |

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|---|---|---|---|--|--|---|---|---|
| <b>Copper and copper alloys / Rame e leghe di rame / Cuivre et alliages de cuivre</b> |   |   |   |  |  |   |   |   |
| N   | CuAl9Ni5Fe3Mn,<br>U-A10N                            |   |   |  |  |   |   |   |
|   | CuAl11Ni5Fe   | G-CuAl11Fe4Ni4                              |   |  |  |   |   |   |
|   | A53-707,<br>CuSn12                                  |   |   |  |  |   |   |   |
|   | CuSn7Pb6Zn4   |   |   |  |  |   |   |   |
|   | CuPb5Sn5Zn5   |   |   |  |  |   |   |   |
|   | CuPb10Sn10  |   |   |  |  |   |   |   |
|   | CuPb20Sn5   |   |   |  |  |   |   |   |
|   | CuCrZr  |   |   |  |  |   |   |   |
|   |   |   |   |  |  |   |   |   |
|   |   |   |   |  |  |   |   |   |
| <b>Magnesium alloy / Lega di magnesio / Alliage de magnésium</b>                      |   |   |   |  |  |   |   |   |
| N   | G-Z4TR,<br>ZH62                                     |   |   |  |  |   |   |   |
|   | G-TR3Z2   |   |   |  |  |   |   |   |
|   | G-Ag2.5   |   |   |  |  |   |   |   |
|   |   |   |   |  |  | M1  |   |   |
|   | G-M2  |   |   |  |  |   |   |   |
|   | G-A3Z1,<br>AZ31                                     |   |   |  |  | 52,<br>51   |   |   |
|   | G-A4S1  |   |   |  |  |   |   |   |
|   | G-A6Z1,<br>AZ61                                     |   |   |  |  | 520,<br>531   |   |   |
|   | AZ63  |   |   |  |  |   |   |   |
|   | G-A9,<br>AZ81                                       | AZ81 hp                                     |   |  | AZ81 hp                                      |   |   |   |
| G-A9Z1,<br>AZ91   | AZ91 hp   |   |   |  | HK31   |   |   |   |
| <b>Duroplast / Plastiche duret / Duroplast</b>  |   |   |   |  |  |   |   |   |
| N   |   |   |   |  |  | Phenolic  |   |   |
|   |   |   |   |  |  |   |   |   |
| <b>Thermoplastic / Termoplastiche / Thermoplastique</b>                               |   |   |   |  |  |   |   |   |
| N   |   |   |   |  |  |   |   |   |
|   |   |   |   |  |  |   |   |   |



# Material comparison table

Tabella confronto materiali

Tableau comparatif des matériaux

| ISO   | Cutting tool group<br>Gruppo di asportazione di materiale<br>Groupe d'usinage | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – W. No. DIN<br>Germania – W.-Nr. DIN EN<br>Allemagne – n° de matériau | Germany – DIN<br>Germania – DIN<br>Allemagne – DIN | Germany – DIN EN<br>Germania – DIN EN<br>Allemagne – DIN EN | Germany – List of manufacturers<br>Allemagne – désignation du fabricant<br>Germania – Denominazione produttore | United Kingdom – B.S.<br>Gran Bretagna – B.S.<br>Grande-Bretagne – B.S. | United Kingdom – EN<br>Gran Bretagna – EN<br>Grande-Bretagne – EN |
|---|---|--|--|--|---|--|---|---|
| <b>Titanium and titanium alloy / Titanio e leghe di titanio / Titane et alliages de titane</b>                        |   |  |  |  |   |  |   |   |
| <b>S</b>  | S6  | 3.7025   |  | Ti 1   | Ti 99.8   | TitaniumGrade1   | TA.1  |   |
|   | S7  | 3.7115.1   |  | TiAl 5 Sn 2  | TiAl5Sn2.5  |  |   |   |
|   | S6  | 3.7124   |  | TiCu2  | TiCu2   |  | TA.21, TA.22, TA.23, TA.24, TA.52, TA.53, TA.54, TA.55, TA.58           |   |
|   | S7  | 3.7164, 3.7165   |  | TiAl 6 V 4   | TiAl6V4   | TitaniumGrade5   | TA.10, TA.11, TA.12, TA.13, TA.28, TA.56                                |   |
| <b>Heat resistant Ni/Co-based alloy / Leghe resistenti al calore a base di Ni/Co / Alliage réfractaire base Ni/Co</b> |   |  |  |  |   |  |   |   |
| <b>S</b>  | S3  | 2.4360   |  | NiCu30Fe   | NiCu30  | Monel 400  | 3072-76, NA13   |   |
|   | S4  | 2.4375   |  | NiCu30Al   | NiCu30Al3Ti   | Monel K500   | 3072-76, HC202, 3146, Na18  |   |
|   | S3  | 2.4630   |  | NiCr20Ti   |   | Nimonic 75   | HR5, 703 B, 203-4   |   |
|   | S3  | 2.4642   |  | NiCr30Fe   |   | Inconel 690, Alloy 690   |   |   |
|   | S4  | 2.4668   |  | NiCr19Fe19NbMo, NiCr19Fe19Nb5Mo3, NiCr19NbMo       | NiCr19Nb5Mo3  | Inconel 718, Udimet 630  | HR 8  |   |
|   | S4  | 2.4669   |  | NiCr15Fe7TiAl, Alloy X-750                         | NiCr15Fe7Ti2Al  | Inconel X-750, Alloy X-750   | HR 505  |   |
|   | S3  | 2.4856   |  | NiCr22Mo9Nb, Alloy 625                             | NiCr22Mo9Nb   | Inconel 625  |   |   |
|   | S3  | 2.4858   |  | NiCr21Mo, Alloy 825                                | NiFe30Cr21Mo3   | Incoloy 825  | 3072-76   |   |
| <b>Chilled cast iron / Ghisa temprata / Fonte trempée</b>   |   |  |  |  |   |  |   |   |
| <b>H</b>  | H4  | 0.9640   |  | G-X300CrMoNi1521                                   | GX300CrMo-Ni15-2-1  |  | Grade3A, Grade3B, BS4844  |   |
|   | H4  | 0.9645   |  | G-X260CrMoNi2021                                   | GX260CrMo-Ni20-2-1  |  | Grade3C   |   |
|   | H4  | 0.9650   |  | G-X260Cr27   | GX260Cr27   |  | Grade3D   |   |
|   | H4  | 0.9655   |  | G-X300CrMo271                                      | GX300CrMo27-1   |  | Grade3E   |   |
| <b>Chilled casting / Ghisa bianca / Fonte dure</b>  |   |  |  |  |   |  |   |   |
| <b>H</b>  | H4  | 0.9620   |  | G-X260NiCr42                                       | GX260NiCr42   | Ni-Hard 2  | Grade2A, BS4844 (1986) 2A   |   |
|   | H4  | 0.9625   |  | G-X330NiCr42                                       | GX330NiCr42   | Ni-Hard 1  | Grade2B, BS4844 (1986) 2B   |   |
|   | H4  | 0.9630   |  | G-X300CrNiSi952                                    | GX300CrNiSi952  | Ni-Hard 4  | Grade2C, Grade2D, Grade2E, BS4844 (1986) 2E                             |   |
|   | H4  | 0.9635   |  | G-X300CrMo153                                      | GX300CrMo15-3   |  | Grade3A;B, Grade3B  |   |

# Material comparison table

Tabella confronto materiali

Tableau comparatif des matériaux

| ISO   | France – AFNOR<br>Francia – AFNOR<br>France – AFNOR       | Italy – UNI<br>Italia – UNI<br>Italia – UNI | Sweden – SS<br>Svezia – SS<br>Svédde –SS | Spain – UNE<br>Spagna –UNE<br>España – UNE | Japan – JIS<br>Giappone – JIS<br>Japon – JIS | USA – AISI/SAE/ASTM<br>USA – AISI/SAE/ASTM<br>États-Unis –<br>AISI/SAE/ASTM | Belgium – NBN<br>Belgio – NBN<br>Belgique – NBN | Russia – GOST<br>Russia – GOST<br>Russie – GOST |
|---|---|---|--|--|--|---|---|---|
| <b>Titanium and titanium alloy / Titanio e leghe di titanio / Titane et alliages de titane</b>                        |   |   |  |  |  |   |   |   |
| <b>S</b>  | T-35  |   |  | Ti-PO1                                     |  |   |   |   |
|   | T-U2  |   |  | Ti-P11                                     |  |   |   |   |
|   | T-A6V   |   |  | Ti-P63                                     |  | 4911, 4928, 4935,<br>4954, 4965, 4967                                       |   |   |
| <b>Heat resistant Ni/Co-based alloy / Leghe resistenti al calore a base di Ni/Co / Alliage réfractaire base Ni/Co</b> |   |   |  |  |  |   |   |   |
| <b>S</b>  | NU30  |   |  |  |  | AMS 4676  |   |   |
|   | NC 20 T   |   |  |  |  |   |   |   |
|   | NC 19 FeNb  |   |  |  |  |   |   |   |
|   | NC 15 FeTNb   |   |  |  |  | 5542G   |   |   |
|   | NC 22 FeDNB   |   |  |  |  |   |   |   |
|   | NC 21 FeDU  |   |  |  |  |   |   |   |
|   | <b>Chilled cast iron / Ghisa temprata / Fonte trempée</b> |   |  |  |  |   |   |   |
| <b>H</b>  |   |   |  |  |  |   |   |   |
|   |   |   |  | 466  |  |   |   |   |
|   |   |   |  |  |  |   |   |   |
| <b>Chilled casting / Ghisa bianca / Fonte dure</b>  |   |   |  |  |  |   |   |   |
| <b>H</b>  |   |   | 512                                      |  |  |   |   |   |
|   |   |   | 513                                      |  |  |   |   |   |
|   |   |   | 457                                      |  |  |   |   |   |

# Hardness comparison

Confronto durezza

Comparaison de la dureté

| Tensile strength<br>Resistenza alla trazione<br>Résistance à la traction<br>N/mm <sup>2</sup> | Vickers | Brinell | Rockwell |
|---|---------|---------|----------|
|   | HV      | HB      | HRC      |
| 255   | 80      | 76.0    | –        |
| 270   | 85      | 80.7    | –        |
| 285   | 90      | 85.5    | –        |
| 305   | 95      | 90.2    | –        |
| 320   | 100     | 95.0    | –        |
| 335   | 105     | 99.8    | –        |
| 350   | 110     | 105     | –        |
| 370   | 115     | 109     | –        |
| 385   | 120     | 114     | –        |
| 400   | 125     | 119     | –        |
| 415   | 130     | 124     | –        |
| 430   | 135     | 128     | –        |
| 450   | 140     | 133     | –        |
| 465   | 145     | 138     | –        |
| 480   | 150     | 143     | –        |
| 495   | 155     | 147     | –        |
| 510   | 160     | 152     | –        |
| 530   | 165     | 156     | –        |
| 545   | 170     | 162     | –        |
| 560   | 175     | 166     | –        |
| 575   | 180     | 171     | –        |
| 595   | 185     | 176     | –        |
| 610   | 190     | 181     | –        |
| 625   | 195     | 185     | –        |
| 640   | 200     | 190     | –        |
| 660   | 205     | 195     | –        |
| 675   | 210     | 199     | –        |
| 690   | 215     | 204     | –        |
| 705   | 220     | 209     | –        |
| 720   | 225     | 214     | –        |
| 740   | 230     | 219     | –        |
| 755   | 235     | 223     | –        |
| 770   | 240     | 228     | 20.3     |
| 785   | 245     | 233     | 21.3     |
| 800   | 250     | 238     | 22.2     |
| 820   | 255     | 242     | 23.1     |
| 835   | 260     | 247     | 24.0     |
| 850   | 265     | 252     | 24.8     |
| 865   | 270     | 257     | 25.6     |
| 880   | 275     | 261     | 26.4     |
| 900   | 280     | 266     | 27.1     |
| 915   | 285     | 271     | 27.8     |
| 930   | 290     | 276     | 28.5     |
| 950   | 295     | 280     | 29.2     |
| 965   | 300     | 285     | 29.8     |
| 995   | 310     | 295     | 31.0     |
| 1030  | 320     | 304     | 32.2     |
| 1060  | 330     | 314     | 33.3     |
| 1095  | 340     | 323     | 34.4     |
| 1125  | 350     | 333     | 35.5     |
| 1155  | 360     | 342     | 36.6     |
| 1190  | 370     | 352     | 37.7     |
| 1220  | 380     | 361     | 38.8     |
| 1255  | 390     | 371     | 39.8     |
| 1290  | 400     | 380     | 40.8     |
| 1320  | 410     | 390     | 41.8     |
| 1350  | 420     | 399     | 42.7     |
| 1385  | 430     | 409     | 43.6     |

# Hardness comparison

Confronto durezza

Comparaison de la dureté

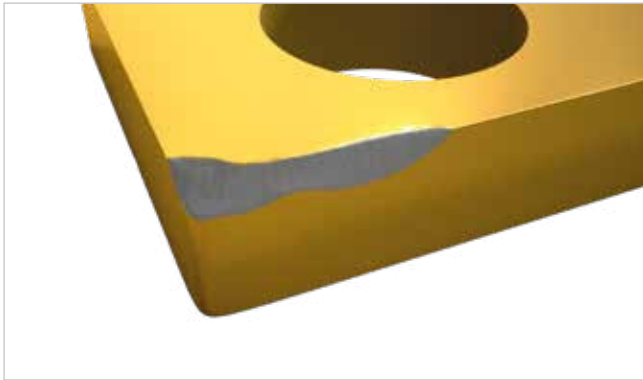
| Tensile strength<br>Resistenza alla trazione<br>Résistance à la traction<br>N/mm <sup>2</sup> | Vickers | Brinell | Rockwell |
|---|---------|---------|----------|
|   | HV      | HB      | HRC      |
| 1420  | 440     | 418     | 44.5     |
| 1455  | 450     | 428     | 45.3     |
| 1485  | 460     | 437     | 46.1     |
| 1520  | 470     | 447     | 46.9     |
| 1555  | 480     | (456)   | 47.7     |
| 1595  | 490     | (466)   | 48.4     |
| 1630  | 500     | (475)   | 49.1     |
| 1665  | 510     | (485)   | 49.8     |
| 1700  | 520     | (494)   | 50.5     |
| 1740  | 530     | (504)   | 51.1     |
| 1775  | 540     | (513)   | 51.7     |
| 1810  | 550     | (523)   | 52.3     |
| 1845  | 560     | (532)   | 53.0     |
| 1880  | 570     | (542)   | 53.6     |
| 1920  | 580     | (551)   | 54.1     |
| 1955  | 590     | (561)   | 54.7     |
| 1995  | 600     | (570)   | 55.2     |
| 2030  | 610     | (580)   | 55.7     |
| 2070  | 620     | (589)   | 56.3     |
| 2105  | 630     | (599)   | 56.8     |
| 2145  | 640     | (608)   | 57.3     |
| 2180  | 650     | (618)   | 57.8     |
| -   | 660     | -       | 58.3     |
| -   | 670     | -       | 58.8     |
| -   | 680     | -       | 59.2     |
| -   | 690     | -       | 59.7     |
| -   | 700     | -       | 60.1     |
| -   | 720     | -       | 61.0     |
| -   | 740     | -       | 61.8     |
| -   | 760     | -       | 62.5     |
| -   | 780     | -       | 63.3     |
| -   | 800     | -       | 64.0     |
| -   | 820     | -       | 64.7     |
| -   | 840     | -       | 65.3     |
| -   | 860     | -       | 65.9     |
| -   | 880     | -       | 66.4     |
| -   | 900     | -       | 67.0     |
| -   | 920     | -       | 67.5     |

## Calculation / Calcolo / Calcul

| Material property<br>Caratteristiche materiale<br>Caractéristiques des matériaux   | Units / test method<br>Unità / metodo di controllo<br>Unité / méthode de contrôle   | Formula symbol<br>Simbolo di formula<br>Symbole |
|--|---|---|
| <b>Tensile strength</b><br>Resistenza alla trazione<br>Résistance à la traction  | N/mm <sup>2</sup>   | R <sub>m</sub>                                  |
| <b>Vickers hardness</b><br>Durezza Vickers<br>Dureté Vickers   | <b>Diamond pyramid 136° – Test force F ≥ 98 N</b><br>Piramide di diamant 136° – Forza di test F ≥ 98 N<br>Piramide di diamante 136° – Forza di prova F ≥ 98 N   | HV  |
| <b>Brinell hardness Calculated by:</b><br>Durezza Brinell calcolata in base a:<br>Dureté Brinell calculée à partir de :<br><b>HB = 0.95 × HV</b> | <b>0.102 × F/D<sup>2</sup> = 30 N/mm<sup>2</sup> – F = test force in N – D = ball diameter in mm</b><br>0,102 × F/D <sup>2</sup> = 30 N/mm <sup>2</sup> – F = Forza di prova in N – D = diametro sfera in mm<br>0,102 × F/D <sup>2</sup> = 30 N/mm <sup>2</sup> – F = force de test en N – D = diamètre sphérique en mm | HB  |
| <b>Rockwell hardness C</b><br>Durezza Rockwell C<br>Dureté Rockwell C  | <b>Diamond cone 120° – Total test force 1471 ± 9 N</b><br>Corno di diamante 120° – Forza di controllo totale 1471 ± 9 N<br>Cône en diamant 120° – Force de test totale 1 471 ± 9 N  | HRC   |

Converted hardness values based on these formulae are only approximations. See DIN 50150  
Le conversioni dei valori di durezza secondo queste formule sono solo approssimative. Vedere DIN 50150  
Les conversions des valeurs de dureté selon ces formules ne sont qu'approximatives. Voir DIN 50150

### Flank wear / Usura sul fianco / Usure de l'espace libre



**Abrasion on the tool flank, normal wear after a long period of operation.**

**Cause:** • Cutting speed too high, • Grade wear resistance too low, • Feed rate too low

**Solution:** • Reduce cutting speed, • Select grade with greater wear resistance, • Check coolant

*Abrasion del tagliente, normale usura dopo un tempo di utilizzo prolungato.*

**Causa:** • Velocità di taglio troppo elevata, • Qualità con resistenza all'usura troppo ridotta, • Avanzamento troppo contenuto

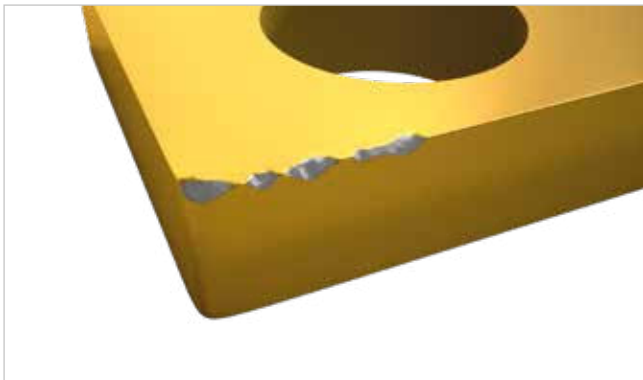
**Rimedio:** • Abbassare la velocità di taglio, • Scegliere una qualità più resistente all'usura, • Controllare il refrigerante

Usure de la surface libre, usure normale après une plus longue durée d'usinage.

**Cause :** • vitesse de coupe trop élevée, • nuance peu résistante à l'usure, • avance trop faible

**Mesures correctives :** • réduire la vitesse de coupe, • choisir une nuance plus résistante à l'usure, • vérifier le liquide de refroidissement

### Cutting edge outbreaks / Rotture del tagliente / Écaillage des bords



**Excessive stresses on the cutting edge may break away small portions of the insert.**

**Cause:** • Grade too wear-resistant, • Vibrations, • Feed rate or cutting depth too high

**Solution:** • Select tougher grade, • Check tool stability, • Stabilise cutting edge

*A causa di eccessiva sollecitazione del tagliente possono staccarsi particelle dall'inserto.*

**Causa:** • Qualità troppo resistente all'usura, • Vibrazioni, • Avanzamento o profondità di taglio troppo elevati

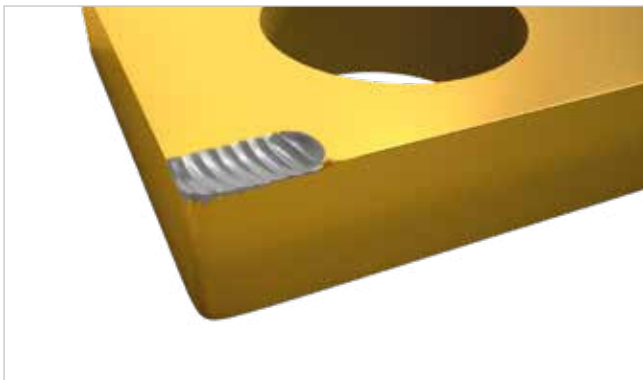
**Rimedio:** • Scegliere una qualità più dura, • Controllare la stabilità dell'utensile, • Stabilizzazione e del tagliente

Des contraintes excessives exercées sur le bord tranchant peuvent provoquer l'écaillage de particules de la plaquette de coupe.

**Cause :** • nuance trop résistante à l'usure, • vibrations, • avance ou profondeur de coupe trop élevée

**Mesures correctives :** • choisir une nuance plus dure, • vérifier la stabilité de l'outil, • stabiliser le bord tranchant

### Crater wear / Usura per craterizzazione / Usure en cratère



**The removed chip causes craters in the insert chip breaker.**

**Cause:** • Cutting speed and/or feed rate too high, • Rake angle too small, • Grade wear resistance too low

**Solution:** • Reduce cutting speed and/or feed rate, • Check coolant, • Select grade with greater wear resistance

*Il truciolo che si forma causa una erosione dell'inserto sulla superficie di truciolatura.*

**Causa:** • Velocità di taglio e/o avanzamento troppo elevati, • Angolo di spoglia superiore troppo piccolo, • Qualità con resistenza all'usura troppo ridotta

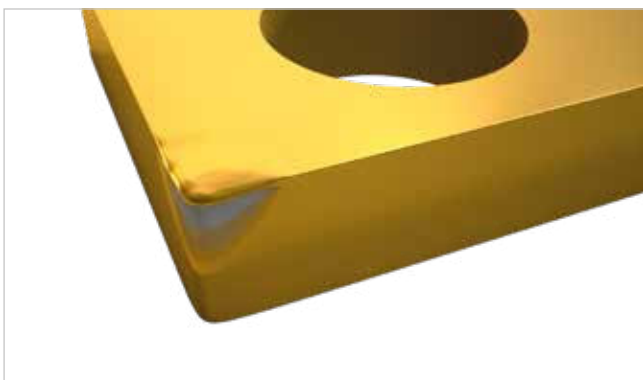
**Rimedio:** • Abbassare la velocità di taglio e/o l'avanzamento, • Controllare il refrigerante, • Scegliere una qualità più resistente all'usura

Le copeau détaché provoque la formation d'un cratère sur la plaquette de la face de coupe.

**Cause :** • vitesse de coupe ou avance trop élevée, • angle de coupe trop faible, • nuance peu résistante à l'usure

**Mesures correctives :** • réduire la vitesse de coupe ou l'avance, • vérifier le liquide de refroidissement, • choisir une nuance plus résistante à l'usure

### Plastic deformation / Deformazione plastica / Déformation plastique



**High machining temperatures coupled with mechanical stresses may result in plastic deformation.**

**Cause:** • Heat generated too high, • Mechanical stresses too high, • Grade unsuitable

**Solution:** • Reduce cutting speed, • Select grade with greater wear resistance, • Check coolant

*Una elevata temperatura di lavoro in presenza di una sollecitazione meccanica può provocare una deformazione plastica.*

**Causa:** • Sviluppo di calore troppo elevato, • Carico meccanico troppo elevato, • Qualità non adatta

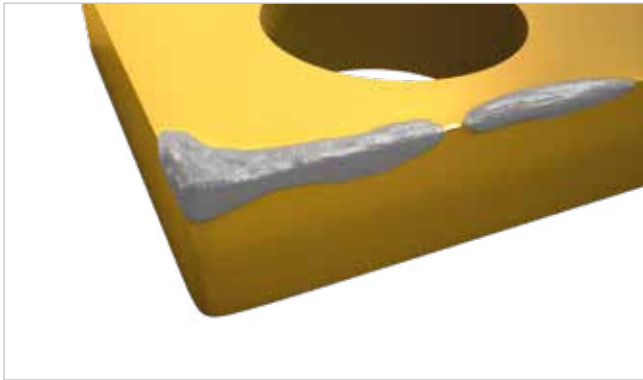
**Rimedio:** • Abbassare la velocità di taglio, • Scegliere una qualità più resistente all'usura, • Controllare il refrigerante

Une température d'usinage élevée associée à des contraintes mécaniques simultanées peut provoquer une déformations plastique.

**Cause :** • production de chaleur trop forte, • contrainte mécanique trop élevée, • nuance non appropriée

**Mesures correctives :** • réduire la vitesse de coupe, • choisir une nuance plus résistante à l'usure, • vérifier le liquide de refroidissement

### Edge build-up / Formazione di taglienti di riporto / Formation d'arêtes de coupe



**Material build-ups at the cutting edge occur when the chip is not properly removed due to the low cutting speed.**

**Cause:**

- Cutting speed too low, • Rake angle too small, • Incorrect grade, • Lack of coolant / lubrication

**Solution:**

- Increase cutting speed, • Increase rake angle, • Select suitable grade, • Check coolant

*Riperti di materiale saldato sul tagliente compaiono se il truciolo, a seguito di una temperatura di taglio troppo bassa, non viene scaricato correttamente.*

**Causa:**

- Velocità di taglio troppo bassa, • Angolo di spoglia superiore troppo piccolo, • Qualità errata, • Mancanza di raffreddamento / lubrificazione

**Rimedio:**

- Aumentare la velocità di taglio, • Aumentare l'angolo di spoglia superiore, • Scegliere una varietà più adatta, • Controllare il refrigerante

Le matériau présente des effets de microsoudures sur le bord tranchant si le copeau n'est pas correctement évacué à cause d'une température de coupe trop faible.

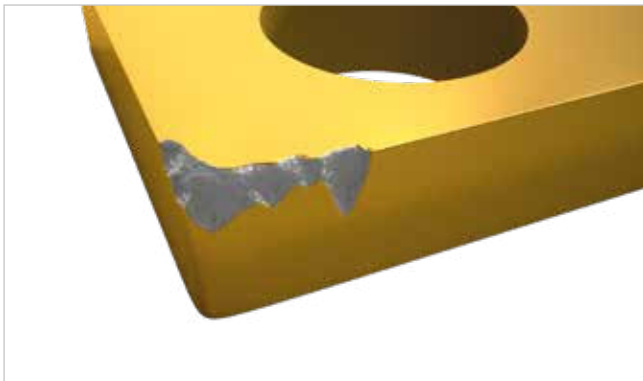
**Cause :**

- vitesse de coupe trop faible, • angle de coupe trop petit, • mauvaise nuance, • refroidissement/graisage défectueux

**Mesures correctives :**

- augmenter la vitesse de coupe, • augmenter l'angle de coupe, • choisir une nuance appropriée, • vérifier le liquide de refroidissement

### Notch wear / Usura da intaglio / Usure en entaille



**Necking at maximum cutting depth.**

**Cause:**

- Oxidation on cutting edge, • Temperature at edge too high, • Incorrect grade

**Solution:**

- Use different cutting depths, • Reduce cutting speed, • Check coolant

*Usura alla massima profondità di passata.*

**Causa:**

- Ossidazione sul tagliente, • Temperatura troppo elevata sul profilo, • Qualità errata

**Rimedio:**

- Utilizzare profondità di taglio differenti, • Abbassare la velocità di taglio, • Controllare il refrigerante

Rétrécissement au niveau de la profondeur de passe maximale.

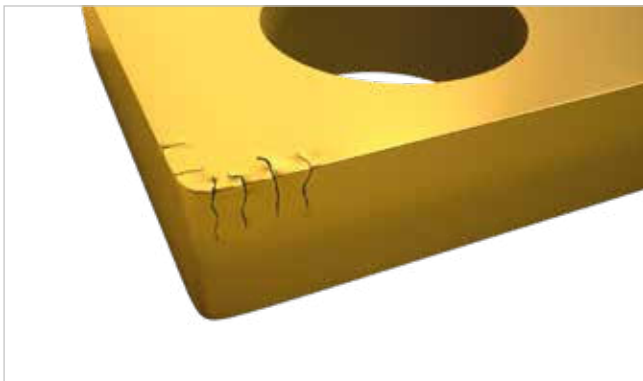
**Cause :**

- oxydation du bord tranchant, • température trop élevée sur le chant, • mauvaise nuance

**Mesures correctives :**

- utiliser différentes profondeurs de coupe, • réduire la vitesse de coupe, • vérifier le liquide de refroidissement

### Thermal cracks / Microfessurazione termica / Fissures thermiques



**Cracks perpendicular to cutting edge. Thermal cracks cause poor surface quality and edge outbreaks.**

**Cause:**

- Change in temperature in interrupted cut, • Temporary blockage of coolant

**Solution:**

- Reduce cutting speed, • Use special grade, • Ensure continuous coolant supply

*Formazione di incrinature verticali rispetto al profilo di taglio. Le incrinature a pettine causano una cattiva qualità della superficie e rotture del profilo.*

**Causa:**

- Cambio di temperatura nel taglio interrotto, • Temporanee zone d'ombra del refrigerante

**Rimedio:**

- Abbassare la velocità di taglio, • Utilizzo di una qualità speciale, • Alimentazione continua del refrigerante

Formation de fissures perpendiculaires au bord tranchant. Les fissures thermiques provoquant une dégradation de l'état de surface et des écaillages des bords.

**Cause :**

- variations de température lors de la coupe interrompue, • temporaire du liquide de refroidissement

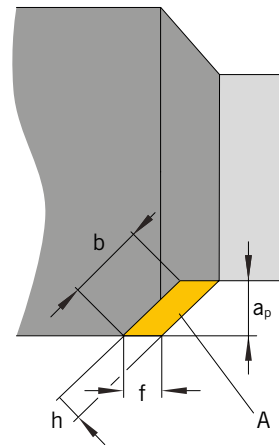
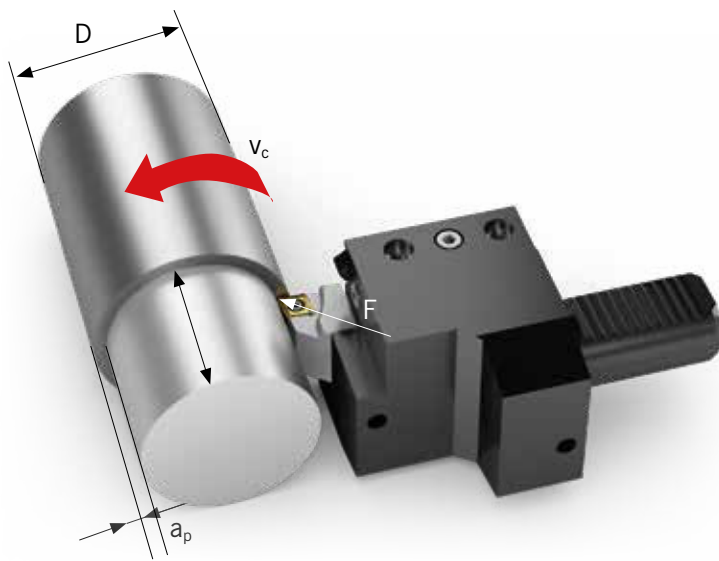
**Mesures correctives :**

- réduire la vitesse de coupe, • utiliser une nuance spéciale, • alimentation continue en liquide de refroidissement

# Application notes: Calculation equations

Suggerimenti tecnici: Formule di calcolo

Consignes d'utilisation : formules de calcul



|                  |   |                      |
|------------------|---|----------------------|
| n                | <b>Speed / Numero di giri / Vitesse de rotation</b> .....   | rpm                  |
| D                | <b>Cutting diameter / Diametro di taglio / Diamètre de coupe</b> .....  | mm                   |
| v <sub>c</sub>   | <b>Cutting speed / Velocità di taglio / Vitesse de coupe</b> .....  | m/min                |
| v <sub>f</sub>   | <b>Feed rate / Velocità di avanzamento / Vitesse d'avance</b> .....   | mm/min               |
| f                | <b>Feed rate per revolution / Avanzamento per giro / Avance par rotation</b> .....                            | mm                   |
| Q                | <b>Chip removal rate / Volume truciolo / Volume d'enlèvement de copeaux</b> .....                             | cm <sup>3</sup> /min |
| a <sub>p</sub>   | <b>Cutting depth / Profondità di taglio / Profondeur de coupe</b> .....                                       | mm                   |
| A                | <b>Chip cross-section / Sezione del truciolo / Section de copeau</b> .....                                    | mm <sup>2</sup>      |
| h                | <b>Chip thickness / Spessore del truciolo / Épaisseur de copeau</b> .....                                     | mm                   |
| b                | <b>Chip width / Larghezza del truciolo / Largeur de copeau</b> .....  | mm                   |
| F                | <b>Main cutting force / Forza di taglio principale / Pression de coupe principale</b> .....                   | N                    |
| k                | <b>Specific cutting force / Forza di taglio specifica / Pression de coupe spécifique</b> .....                | N/mm <sup>2</sup>    |
| P <sub>c</sub>   | <b>Net driving power / Potenza motrice netta / Puissance motrice nette</b> .....                              | kW                   |
| t                | <b>Engagement time / Tempo di lavorazione / Durée d'usinage</b> .....   | min                  |
| l                | <b>Machining length / Lunghezza di lavorazione / Longueur d'usinage</b> .....                                 | mm                   |
| l <sub>c</sub>   | <b>Turning length (machined) / Lunghezza di tornitura (sviluppata) / Longueur de tournage (traitée)</b> ..... | m                    |
| R <sub>max</sub> | <b>Roughness / Rugosità / Rugosité</b> .....  | µm                   |
| r                | <b>Corner radius / Raggio di punta / Rayon d'angle</b> .....  | mm                   |
| η                | <b>Machine efficiency / Grado di efficacia della macchina / Rendement machine</b>                             |                      |

## Speed

Numero di giri  
Vitesse de rotation

$$n = \frac{v_c \times 1000}{D \times \pi} \quad [\text{min}^{-1}]$$

## Cutting speed

Velocità di taglio  
Vitesse de coupe

$$v_c = \frac{\pi \times D \times n}{1000} \quad [\text{m/min}]$$

## Feed rate

Avanzamento  
Avance

$$v_f = n \times f \quad [\text{mm/min}]$$

## Application notes: Calculation equations

Suggerimenti tecnici: Formule di calcolo

Consignes d'utilisation : formules de calcul



|  |   |                        |
|--|---|------------------------|
| <b>Chip removal rate</b><br><i>Volume truciolo</i><br>Volume d'enlèvement de copeaux                       | $Q = v_c \times a_p \times f \times \left(1 - \frac{a_p}{D}\right)$ | [cm <sup>3</sup> /min] |
| <b>Chip cross-section</b><br><i>Sezione del truciolo</i><br>Section de copeau                              | $A = h \times b = a_p \times f$                                     | [mm <sup>2</sup> ]     |
| <b>Chip width</b><br><i>Larghezza del truciolo</i><br>Largeur de copeau                                    | $b = \frac{a_p}{\sin \kappa}$                                       | [mm]                   |
| <b>Chip thickness</b><br><i>Spessore del truciolo</i><br>Épaisseur de copeau                               | $h = f \times \sin \kappa$  | [mm]                   |
| <b>Cutting force</b><br><i>Forza di taglio</i><br>Pression de coupe  | $F_c = A \times k_c \times h^{-mc}$                                 | [N]                    |
| <b>Specific cutting force</b><br><i>Forza di taglio specifica</i><br>Pression de coupe spécifique          | $k_c = \frac{k_c}{h}$   | [N/mm <sup>2</sup> ]   |
| <b>Drive power</b><br><i>Potenza motrice</i><br>Puissance motrice  | $P_c = \frac{Q \times k_c}{60000 \times \eta}$                      | [kW]                   |
| <b>Operating time</b><br><i>Tempo di lavorazione</i><br>Durée d'usinage                                    | $t = \frac{l}{f \times n}$  | [min]                  |
| <b>Roughness</b><br><i>Rugosità</i><br>Rugosité  | $R_{\max} = \frac{f^2}{8 \times r} \times 1000$                     | [μm]                   |
| <b>Machined turning length</b><br><i>Lunghezza sviluppata di tornitura</i><br>Longueur de tournage traitée | $l_c = \frac{D \times \pi}{1000} \times \frac{l}{f}$                | [m]                    |



# Application notes: Surface quality

Suggerimenti tecnici: Finitura superficiale

Consignes d'utilisation : états de surface

|  |   |  <b>Corner radius [mm]</b><br>Raggio di punta [mm]<br>Rayon d'angle [mm] |      |              |              |              |              |  <b>Round indexable insert [diameter mm]</b><br>Inserto tondo [ø mm]<br>Plaque de coupe amovible ronde [ø mm] |      |      |              |              |              |              |
|--|---|---|------|--------------|--------------|--------------|--------------|---|------|------|--------------|--------------|--------------|--------------|
|  |   | 0.2   | 0.4  | 0.8          | 1.2          | 1.6          | 2.4          | 6   | 8    | 10   | 12           | 16           | 20           | 25           |
| <b>Theoretical Ra/Rz values</b><br>Ra teorico/Valori Rz<br>Valeurs ra-/rz théoriques | 0.4 μm - 1.6 μm   | 0.05 0.07 0.10  |      |              |              |              |              | 0.20 0.23 0.25  |      |      |              |              |              |              |
|  | 1.6 μm - 6.3 μm   | 0.08  | 0.11 | 0.15         | 0.19         |              |              | 0.31  | 0.36 | 0.40 | 0.44         | 0.51         |              |              |
|  | 3.2 μm - 12.5 μm  | 0.13  | 0.17 | 0.24         | 0.29         | 0.34         | 0.42         | 0.49  | 0.56 | 0.63 | 0.69         | 0.80         | 0.89         |              |
|  | 6.3 μm - 25 μm  |   | 0.22 | 0.30         | 0.37         | 0.43         | 0.53         | 0.62  | 0.72 | 0.80 | 0.88         | 1.01         | 1.13         | 1.26         |
|  | 8 μm - 32 μm  |   |      | 0.38         | 0.47         | 0.54         | 0.66         |   |      | 1.00 | 1.10         | 1.26         | 1.42         | 1.58         |
|  | 32 μm - 100 μm  |   |      |              |              | 1.08         | 1.32         |   |      |      |              | 2.54         | 2.94         | 3.33         |
| <b>Feed rate</b><br>Avanzamento<br>Avance  | <b>Finishing to medium machining</b><br>Da finitura a lavorazione media<br>Finition à l'usinage de semi-finition      | 0.04 0.07 0.10 0.20   |      |              |              |              |              | 0.20 0.23 0.25  |      |      |              |              |              |              |
|  | <b>Medium machining to roughing</b><br>Da lavorazione media a lavorazione di sgrossatura<br>Semi-finition à l'ébauche | 0.15 0.22 0.30 0.40   |      |              |              |              |              | 0.60 0.70 0.80  |      |      |              |              |              |              |
|  |   |   |      | 0.25         | 0.35         | 0.40         | 0.50         |   |      |      | 0.40         | 0.50         | 0.60         | 0.70         |
|  |   |   |      | to<br>a<br>à | to<br>a<br>à | to<br>a<br>à | to<br>a<br>à |   |      |      | to<br>a<br>à | to<br>a<br>à | to<br>a<br>à | to<br>a<br>à |
|  |   |   |      | 0.60         | 0.85         | 1.00         | 1.20         |   |      |      | 0.80         | 1.00         | 1.25         | 1.50         |

R<sub>max</sub> **Profile roughness depth** / Rugosità-Profondità di profilo / Rugosité/profondeur du profil μm

f **Feed rate per revolution** / Avanzamento per giro / Avance par rotation mm

r **Corner radius of indexable insert** / Raggio di punta dell'insert / Rayon d'angle de la plaque mm

# Application notes: Vibration tendency

Suggerimenti tecnici: Tendenza alla vibrazione

Consignes d'utilisation : Réduction des vibrations

Vibrations occur when long, thin workpieces are machined or when long projecting boring bars are used for internal machining. This occurs in particular at  $L/D > 4$ .

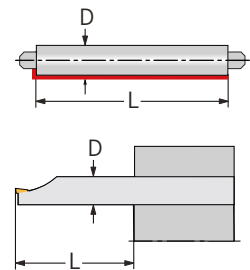
Note the following parameters when selecting a tool in order to reduce the risk of vibration:





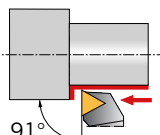
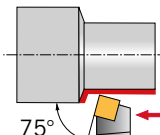
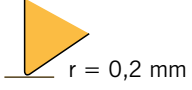
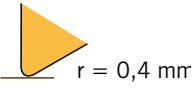




*Durante la lavorazione di componenti lunghi e sottili o durante la lavorazione interna con baren lunghi e sporgenti compaiono vibrazioni. In particolare quando  $L/D > 4$ .*

*Nella scelta dell'utensile è necessario attenersi ai seguenti parametri per ridurre il rischio di vibrazioni:*

Des vibrations se produisent lors de l'usinage de composants longs et fins ou lors de l'usinage intérieur avec barres d'alésage en saillie longue. Cela est particulièrement le cas pour  $L/D > 4$ .

Les paramètres suivants doivent être pris en compte lors du choix de l'outil afin d'éviter tout risque de vibrations :



|  | low vibration tendency<br><i>Ridotta tendenza alla vibrazione</i><br>faible réduction des vibrations | high vibration tendency<br><i>Elevata tendenza alla vibrazione</i><br>forte réduction des vibrations       |
|--|--|--|
| <b>Basic insert shape</b><br><i>Forma di base inserto</i><br>Forme de base de la plaquette             | <br>positiv         | <br>negativ doppelseitig |
| <b>Insert shape</b><br><i>Forma di inserto</i><br>Forme de la plaquette                                | <br>35°            | <br>80°                 |
| <b>Approach angle</b><br><i>Angolo di attacco</i><br>Angle d'attaque                                   | <br>91°           | <br>75°                |
| <b>Corner angle</b><br><i>Raggio di punta</i><br>Rayon d'angle   | <br>r = 0,2 mm    | <br>r = 0,4 mm         |
| <b>Effective rake angle</b><br><i>Angolo di spoglia superiore effettivo</i><br>Angle de coupe effectif |                   |                        |
| <b>Coating</b><br><i>Rivestimento</i><br>Revêtement  | <br>unbeschichtet | <br>PVD                |

After selecting the tool /indexable insert, other factors are decisive to reduce vibrations:

1. Clamp tools and boring bars as short as possible
2. Select cutting depth 0.1 mm larger than corner radius of indexable insert
3. If vibrations occur, reduce cutting speed by 50–70% compared to specified catalogue values
4. Check clamping pressure at tailstock sleeve when performing external machining

*Una volta scelto l'utensile / l'inserto vi sono altri fattori decisivi per la riduzione delle vibrazioni:*

1. Serrare utensili e baren in modo che siano più corti possibile
2. Scegliere la profondità di taglio 0,1 mm maggiore del raggio di punta dell'inserto
3. Se compaiono vibrazioni, ridurre la velocità di taglio del 50-70 % rispetto ai valori indicati nel catalogo
4. Controllo della pressione di serraggio sul cannotto della contropunta durante la lavorazione esterna

Une fois l'outil/ la plaquette de coupe amovible choisi(e), d'autres facteurs doivent être essentiels pour réduire les vibrations :

1. Serrer le plus possible les outils et les barres d'alésage
2. Choisir une profondeur de coupe de 0,1 mm supérieure au rayon d'angle de la plaquette de coupe amovible
3. Si des vibrations se produisent, réduire la vitesse de coupe de 50 à 70 % par rapport aux valeurs indiquées dans le catalogue
4. Vérifier la pression de serrage sur la contre-pointe lors de l'usinage extérieur

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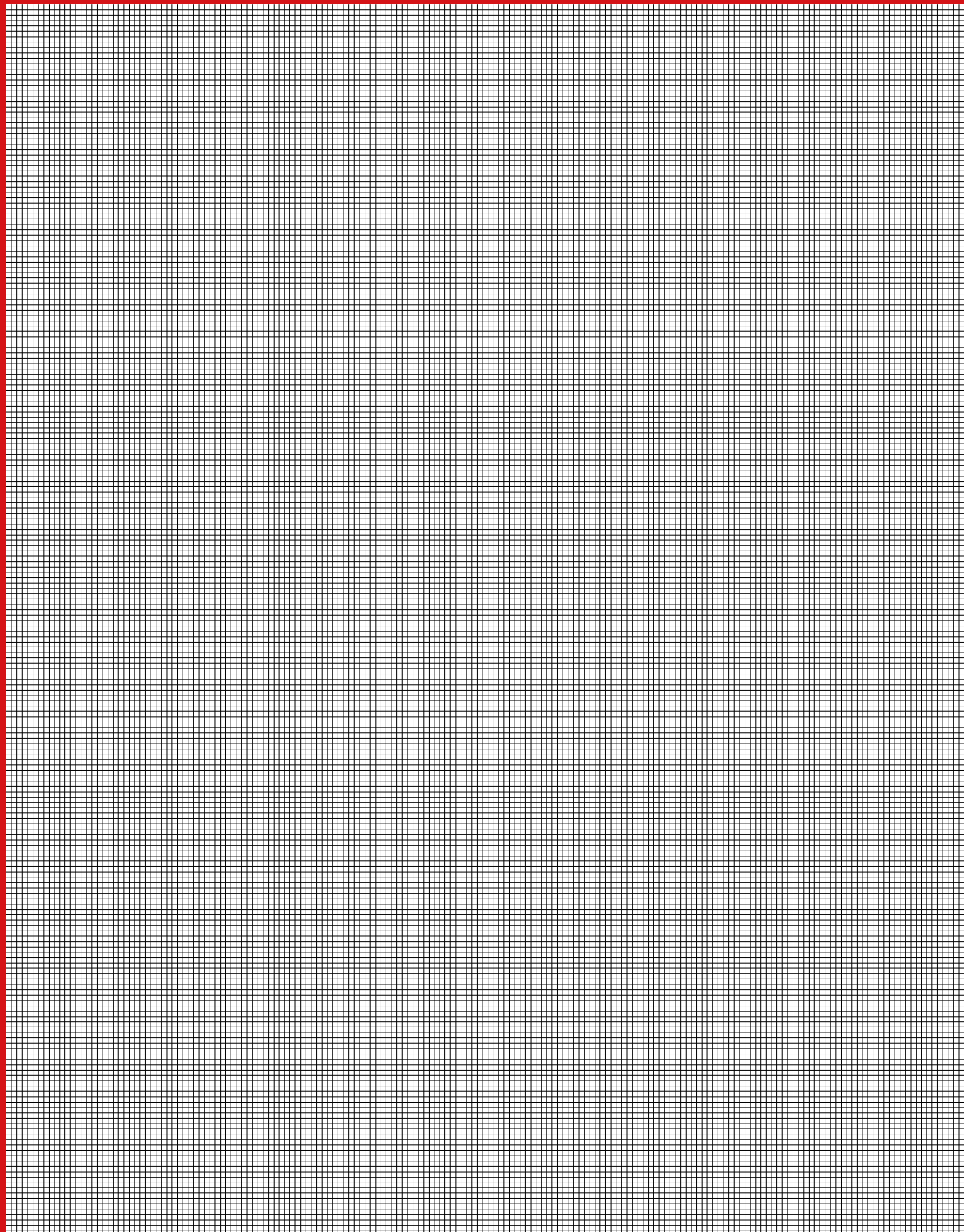
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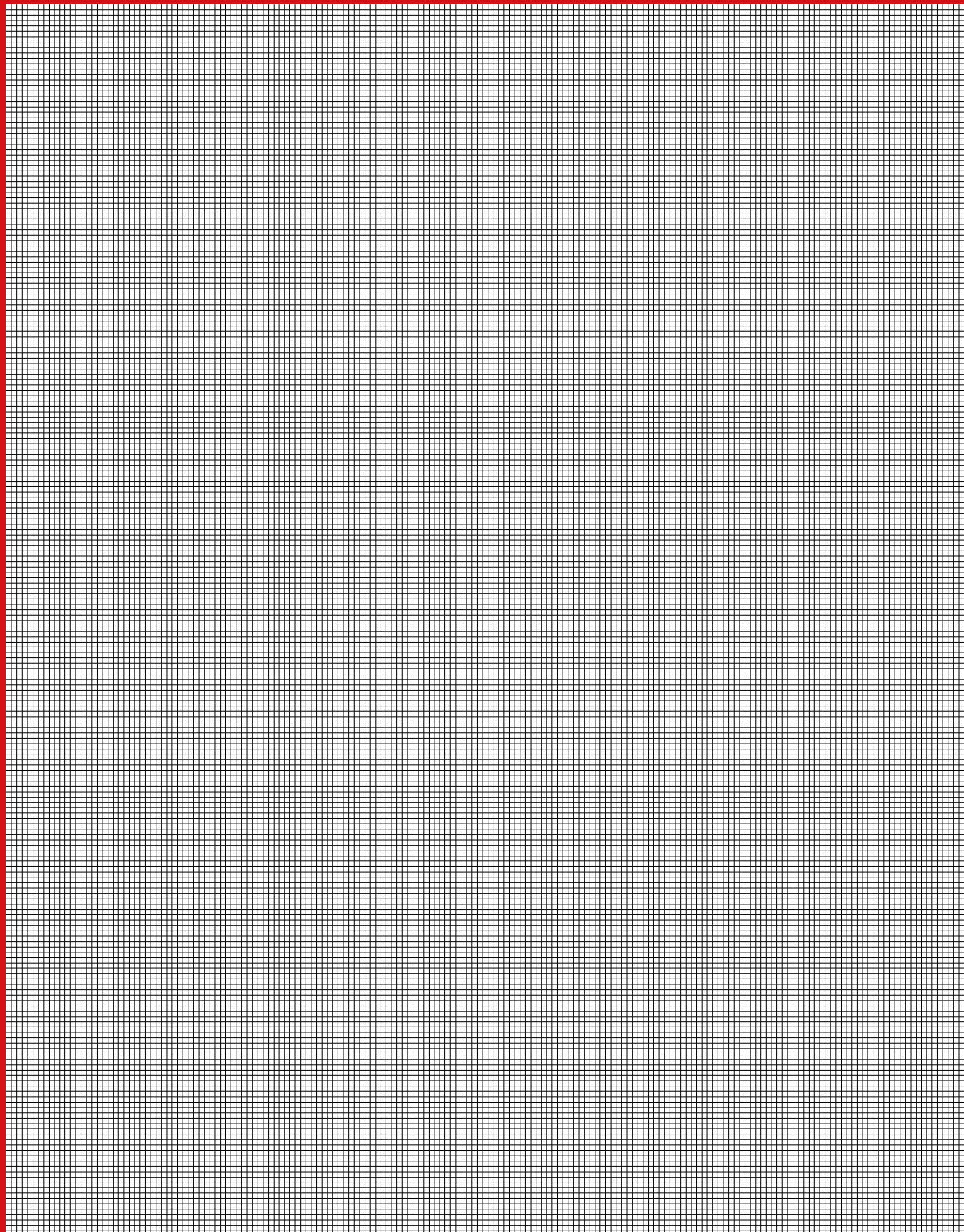
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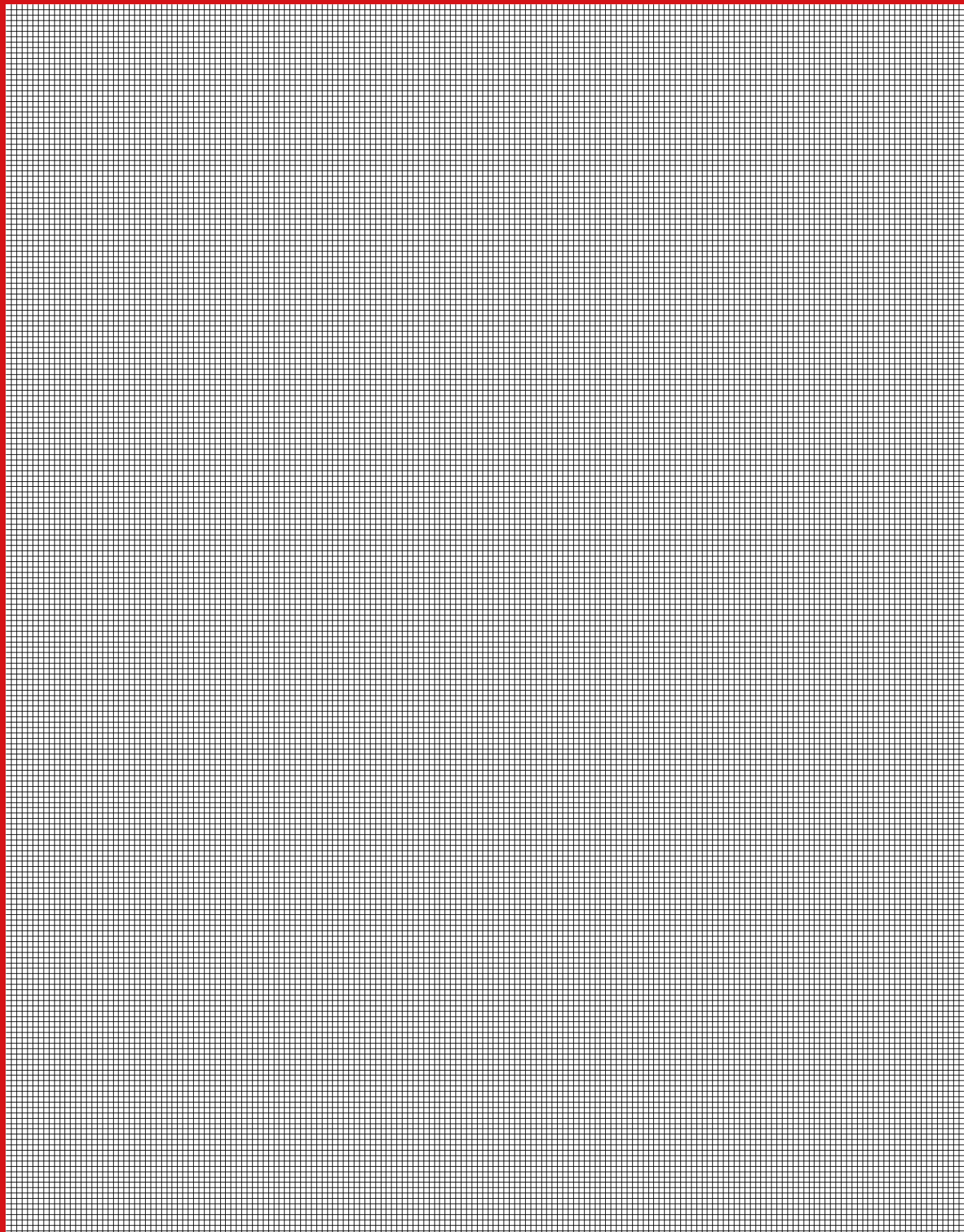
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