

Turning

ARNO Werkzeuge lets you benefit from lasting quality, long tool life and versatile solutions for difficult-to-machine materials – for increased productivity.

OUTSTANDING

OUTSTANDING FOR GREATER PRODUCTIVITY IN YOUR BUSINESS.

Do you have challenging machining tasks? We have outstanding solutions. For three generations, we have been developing tool systems based on outstanding quality, long tool life and process reliability. As an ARNO customer, you benefit from a combination of experience and pioneering spirit that has been a cornerstone of our family-owned company's tradition since day one. Besides these values we are also influenced by the typical Swabian talent for inventiveness. We are proud to help our customers secure an extra competitive edge through clever new products and advancements, and we will continue along this path in the future.

TURNING WITH ARNO.

04	The ARNO added value
10	System highlights: Turning
12	KMH tool holders
14	Cutting inserts and carrier tools with through-tool coolant
16	Our range of indexable inserts
18	High-positive indexable inserts for long-chipping materials
20	Indexable inserts for exotic materials
22	Indexable inserts for hard turning
24	Indexable inserts for wheel machining
26	ARNO Grinding Shop – an interview with Thomas Zeiträg
28	ARNO systems for turning
30	Overview
32	External machining
34	Internal machining
36	ARNO AMS mini-system
38	SIM internal machining
40	SHARK-CUT multi-purpose tool
42	Thread cutting
44	Application overview
46	Success story
50	ARNO Services

EVERYTHING REVOLVES AROUND EFFICIENCY.

Extremely high-positive

Precise fit for any application: the largest portfolio of high-positive indexable inserts in the world is the solution for thin-walled parts and difficult-to-machine materials.

Optimal tip height

The ARNO AMS Mini-System always achieves immediate, perfect positioning at tip height.

Simply unique

From the coolant connection to the length of the tool holders – our ARNO Special Design range ensures you get customized products.



Multi-purpose

Turning and drilling with only one tool: SHARK-CUT is the ideal solution way to compensate for a lack of tool positions on the machine.

Lasting quality

Nickel-plated holders with a high tensile strength, meticulously ground indexable inserts and consequently a precise insert seat. These and many other quality factors ensure our products have a long tool life and deliver optimum results.

Fully equipped

Numerous holder variants, a large variety of coatings, sintered, ground and stocked inserts in various sizes and with different corner radii – at ARNO you will almost always find the right tool. And if not, simply ask us about our custom solutions.

All-inclusive package

We make your work easier all the way down the line through personal consulting, fast delivery and comprehensive documentation.

Grinding experience – 3 million parts per year

We process this number of inserts year in, year out. Since the 1990s we have been constantly expanding our in-house grinding shop and the associated know-how.



HIGH QUALITY LEADS TO HIGH PRODUCTIVITY.

Interview: Tobias Breitling, Sales Engineer at ARNO Werkzeuge discusses the ARNO solutions for turning.

Why should customers opt for ARNO for their turning applications?

Because with us, they have a single contact for pretty much all applications. We even make custom adjustments possible without significant expense. In addition, we offer consistently high quality across all product groups, which isn't something you find everywhere. Or sound technical advice from sales right through to product design and application engineering. This really makes a difference for customers who need support quickly.

So as a customer I not only benefit from innovative products, but also from the advice I receive from ARNO?

Exactly. We don't simply find our customers a product from our catalogue, instead we get to the bottom of their requirements. That can sometimes mean advising the customer not to buy a product. Our customers should feel looked after and well advised at ARNO. Accordingly, we have enjoyed trust-based partnerships with most of our customers for many years.

You said that ARNO can cover virtually turning applications – so is your product range very large?

Definitely. For our customers, this has the advantage that they can get everything, or at least a lot, from a single source. KMH holders with direct coolant transfer for all common machines, carrier tools with or without through-tool coolant for internal or external turning and, of course, our huge selection of inserts. Here we have a very wide range of products that you won't find even at the large tool manufacturers.

What, for example, does only ARNO offer?

Our variety of high-positive indexable inserts – that's unique. We not only offer different geometries and types, but also corner radii from 0.05 to 3 mm as well as intermediate sizes. All produced by us in-house – the quality of our inserts is world class. This makes us real specialists when it comes to machining challenging materials and workpieces. However, generally speaking, there's no doubt that ARNO offers excellent product quality.





"Our know-how contributes to our customers' success!"

But isn't high quality also very expensive? Is it really worth the cost?

Firstly, the value for money offered by ARNO is really excellent. And secondly, the cost of good tools is much lower than if I produce scrap by using inferior tools. Having the best machinery is no good if I then save money on cheaper tools. That's why at ARNO we feel it's so important to deliver outstanding quality across our entire product range. I already mentioned our ground inserts. However, our carrier tools are made of a high-quality material, are completely nickel-plated and have excellent tensile strength. This, in turn, provides a precise seat, even with a 35-degree VCGT. These holders are even impervious to falling chips. I could give you many more examples, it really applies to everything – high quality leads to high productivity.

A focus on productivity – to what extent can ARNO give its customers a head start over the competition?

As I said, through our extremely high quality. This allows our customers to produce faster, safer and with better surface qualities at the first attempt. And also, of course, thanks to our product diversity. Especially in the area of finishing and superfinishing, we have one of the most extensive and highest quality portfolios in the market. And then, naturally, there is our know-how and innovative strength that contributes to our customers' success. Because I can only achieve the optimum result by using a product correctly with an awareness of what is currently possible. To do this, I need people who know what they're talking about. And we have a lot of them at ARNO.

100% RELIABILITY – MAXIMUM SAVINGS.

The challenge

The machining of austenitic stainless steels can lead to chipping problems if sub-optimal tools are used. This can have serious consequences, especially when long chips get wound around the component. The surface of the workpiece can become damaged and the machine must be stopped to remedy the jammed chip – a double cost factor.

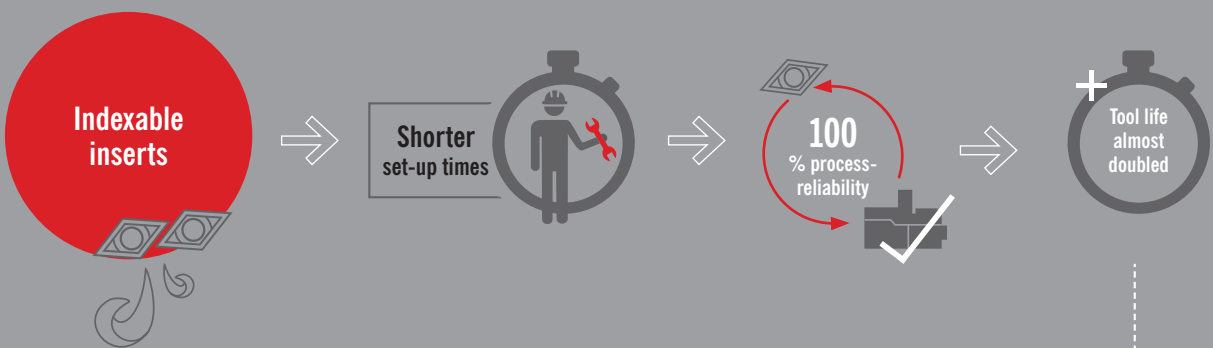
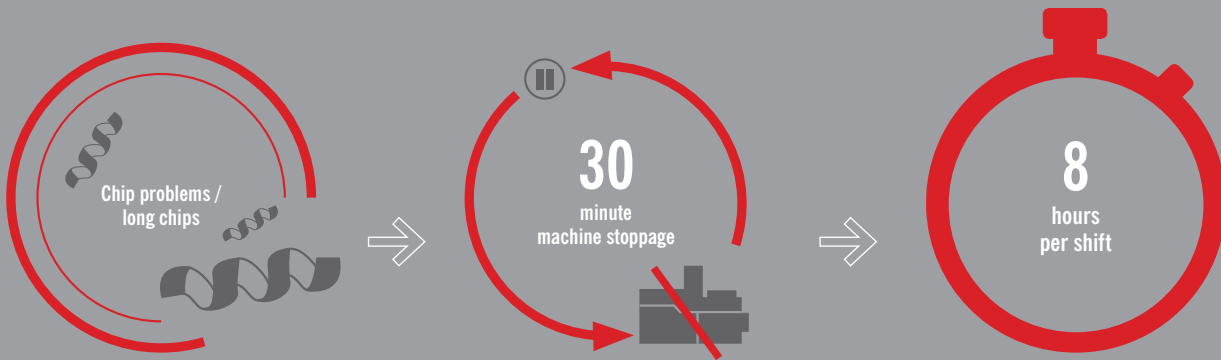
The solution

100% process reliability thanks to inserts with positive PM1 geometry in type AM2130 from ARNO – the perfect combination for stainless steel:

- **The tool life is increased by 90% through the use of the ARNO indexable insert – this reduces both tool costs and set-up times.**
- **The quality is improved across the board – thanks to the consistently high surface quality and dimensional accuracy of the workpieces.**
- **No more downtime caused by long chips – the indexable insert from ARNO ensures absolutely smooth processes and short chips, while remaining cost-effective.**

The result

Shorter set-up times, increased tool life and low tooling costs provide enormous savings potential. This example clearly shows that the use of indexable inserts whose geometries and types are optimally matched to the application is definitely worthwhile. Do you also want to benefit from our custom solutions? We'll be glad to advise you!



Savings per day in a 3-shift system 1.5 hours downtime

$250 \text{ working days} \times 1.5 \text{ hours} \times \text{€ } 70 \text{ hourly cost} = \text{€ } 26,250 \text{ total savings per machine per year}$

INNOVATIVE HIGHLIGHTS FOR MORE PRODUCTIVITY.

From finishing to roughing, from steel to superalloys, from thin-walled components to components for shipbuilding, no matter what conditions apply to your turning applications – ARNO always has an innovative solution to ensure smooth, profitable processes:

FLEXIBILITY GUARANTEED

KMH tool holders

Normal or overhead, with or without through-tool coolant – the KMH tool holders with VDI shank from ARNO are suitable for almost every application. If you opt for a variant with through-tool coolant, you not only benefit from our wide selection but also from direct, precise coolant transfer – for more information see page 12.

COOL BENEFITS

Cutting inserts and carrier tools with through-tool coolant

For external machining, ARNO carrier tools guarantee optimal tool life via three coolant supplies. Cutting inserts with coolant channels provide optimum wear protection for the ARNO AMS Mini-System. For more details, see page 14.

ATTENTION PAID TO EVERY DETAIL

Indexable inserts from ARNO

Huge selection and outstanding quality down to the smallest detail – with ARNO inserts you are guaranteed to find the optimum model – especially for challenging materials. For more details, see page 16.

30 YEARS OF EXPERIENCE

Grinding expertise at ARNO

When it comes to the quality of our indexable inserts, we leave nothing to chance – and give them the finishing touch in our large grinding shop. For more details, see page 26.

"At ARNO, the bar is set really high."

My training revolves around precision tools. Of course, I'm in the perfect place in ARNO's grinding shop. I especially like the modern machinery here. The possibilities with computer-controlled systems are really fascinating. Of course, we also have to consider a lot of things – and stay within very tight tolerances. We pay close attention to ensure a perfect fit and would rather grind another blank than deliver a less-than-perfect tool. The bar is set really high at ARNO – but that's exactly what I like. And because the working atmosphere here is so good, it makes the work even more fun.

Lara Sprenger, apprentice in precision tool technology at ARNO.



FLEXIBLE SEAT FOR EVERY SITUATION.

**Well thought-out for a wide variety of applications:
KMH tool holders with VDI shank from ARNO.**

You simply can't go wrong with KMH tool holders from ARNO. And not just because they fit almost every machine type with VDI holding tools. But also because they can be mounted both normally and overhead. Whether with or without through-tool coolant – at the interface to the machine you can completely dispense with hoses and interference edges on which chips could get caught.

The coolant supply with direct transfer from the holder to the tool holder is made simple and safe via scaling. This ensures that you benefit from repeat accuracy, stability and flexibility in every case.



SOLID BENEFITS

of KMH tool holders from ARNO

Varied – available for almost every machine type with a VDI shank and mountable in the normal or overhead position

Easy – precise coolant transfer from the machine via the holder to the carrier tool

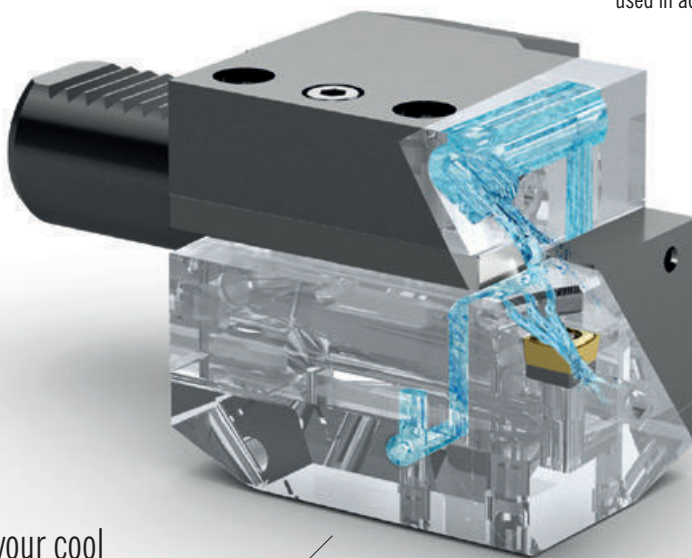
Practical – machine interface without hoses or interference edges



ARNO DIGITAL // All benefits of KMH tool holders in a video on our YouTube channel.

Versatile stability

- Optimally adapted holders ensure maximum stability and safety. Thanks to special holders or clamping blocks, grooving modules and grooving blades can be used in addition to monoblock holders.



Always keep your cool

- The coolant transfer defined within the scaling guarantees effective cooling. For holders without through-tool coolant, the adjustable, external coolant supply from above ensures safe processes.

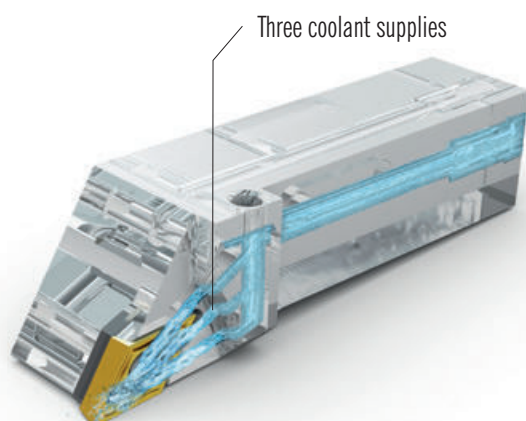
COOL, WHERE IT REALLY MATTERS.

Optimal cooling, even when space is tight – thanks to cutting inserts with coolant channel for the ARNO AMS Mini-System.

Accurate coolant supply for maximum wear protection is easily achieved thanks to the AMS cutting inserts with coolant channel. For through-bores, coolant channels from above are ideal (IKO), as they move the chips forward away from the flute. For blind holes, however, coolant channels from the bottom (IKU) are the right choice, since they allow the chips to be guided behind the flute and flushed out.

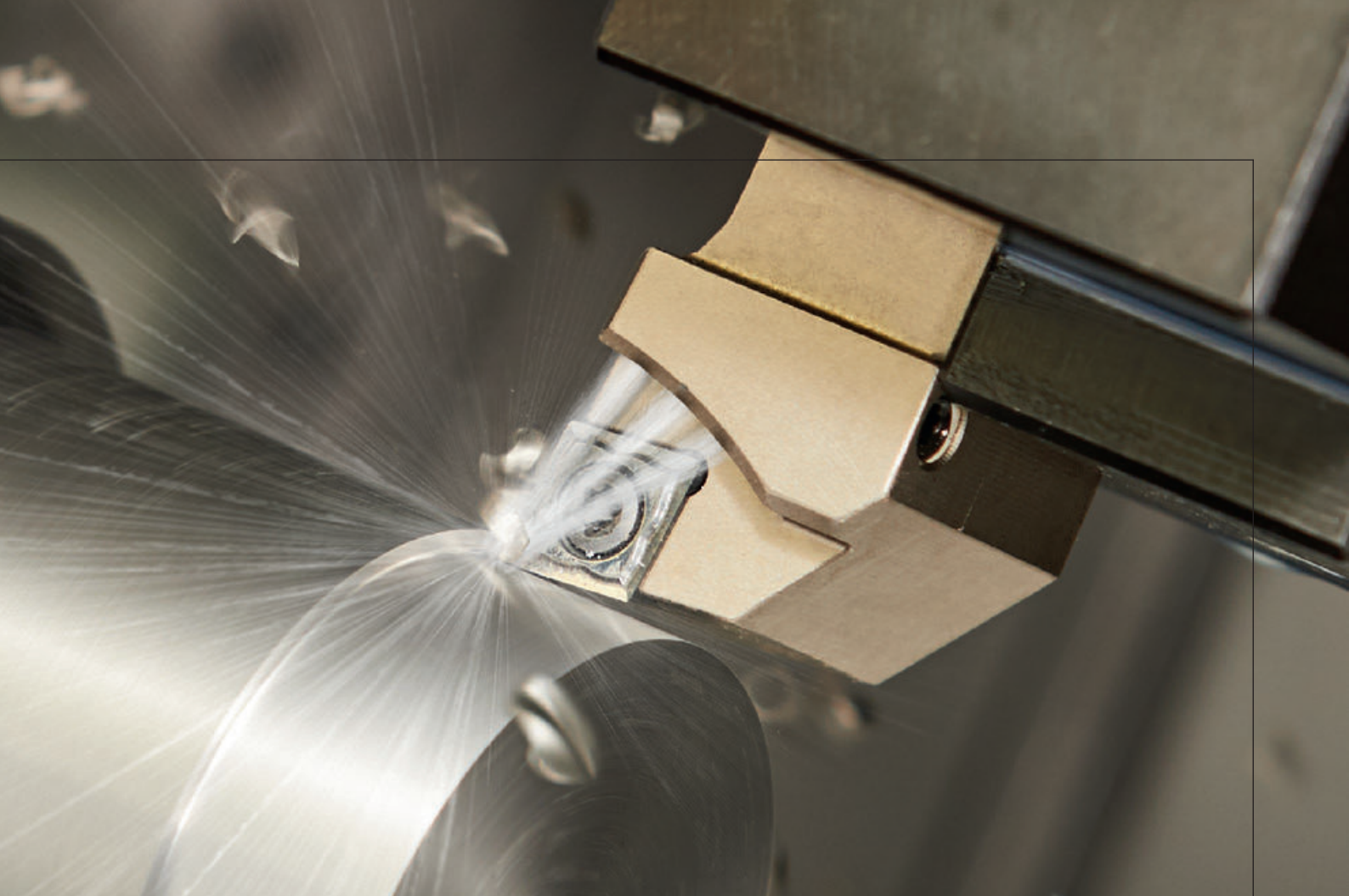
Triple coolness: ARNO carrier tools for external machining with three coolant supplies.

Threefold cooling of the insert is guaranteed – three coolant supplies direct the coolant to the cutting zone, the chips are efficiently removed and the tool life is extended. Thanks to scaling, the coolant transfer together with the KMH tool holders from ARNO is easier than ever – without any troublesome hose connections and with absolute precision. If required, the coolant transfer can also be customised.

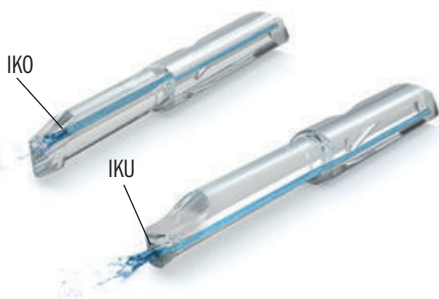


Three nozzles for smooth processes

No less than three nozzles on the ARNO carrier tools for external machining ensure efficient cooling of the insert and optimum chip evacuation. Thanks to scaling, the coolant transfer from the ARNO KMH tool holder is extremely simple. The result: long tool life and reliable processes.



ARNO INFO // Three coolant holes on tool holes optimise chip evacuation.



Optimum chip evacuation for safe drilling

Thanks to two possible positions for the coolant holes – either above (IKO) or below (IKU). This means the right cutting insert for optimum wear protection is always available for every application.



COOL BENEFITS

of ARNO carrier tools and cutting inserts with through-tool coolant

Guided coolant supply – requires no adjustment, eliminates errors

Longer tool life thanks to reduced wear

Optimal chip breakage and targeted chip evacuation

MEGA SELECTION – AND EVERY INSERT IS A CHAMP.

From precision machining of thin-walled workpieces to roughing of large components, ARNO has the optimum indexable insert for every application.

Are you looking for a specific indexable insert? Just ask us! ARNO offers a variety of geometries and types – negative, positive or high-positive, (precision) sintered or ground, made of carbide, cermet or brazed. As different as they are, you can be sure that every indexable insert from ARNO has one thing in common – consistent top quality.



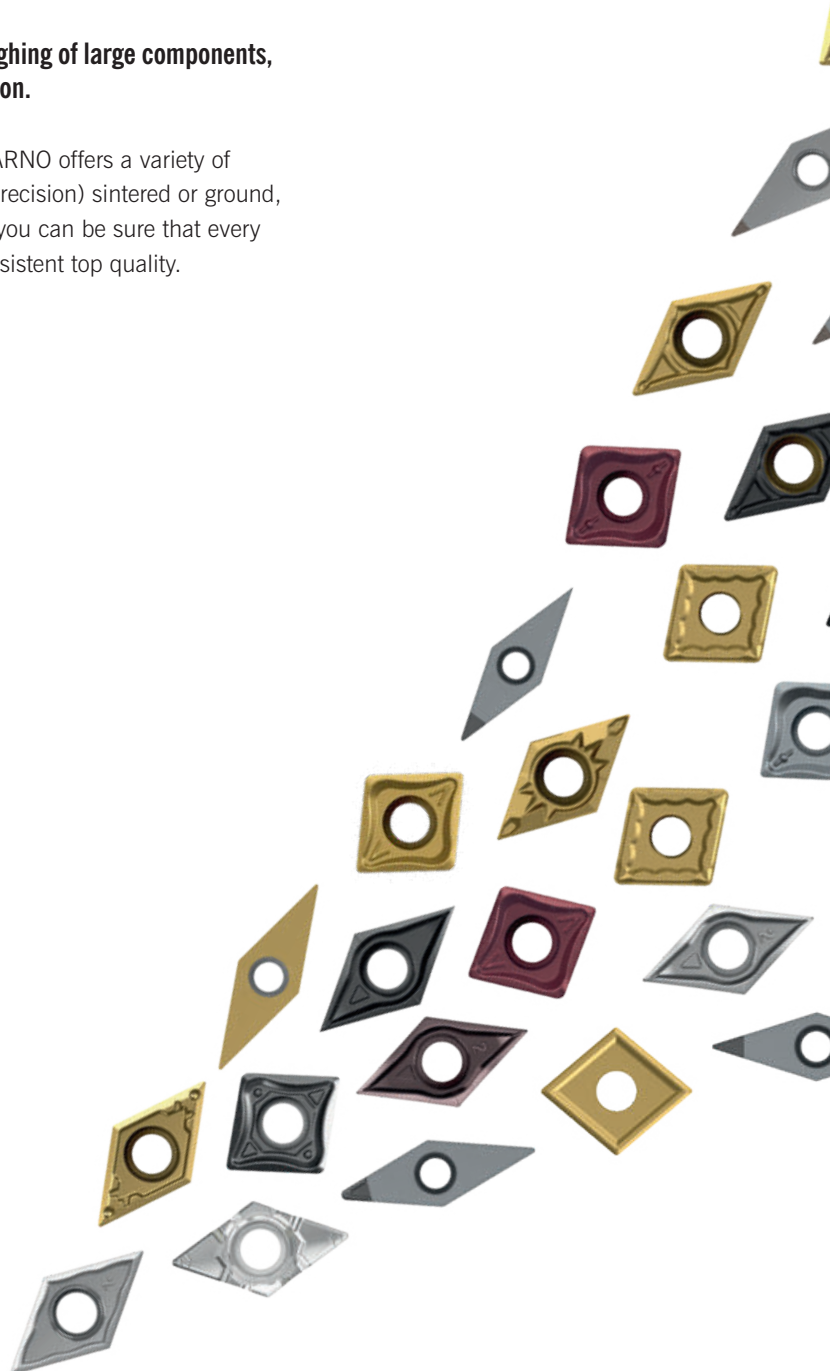
NUMEROUS BENEFITS

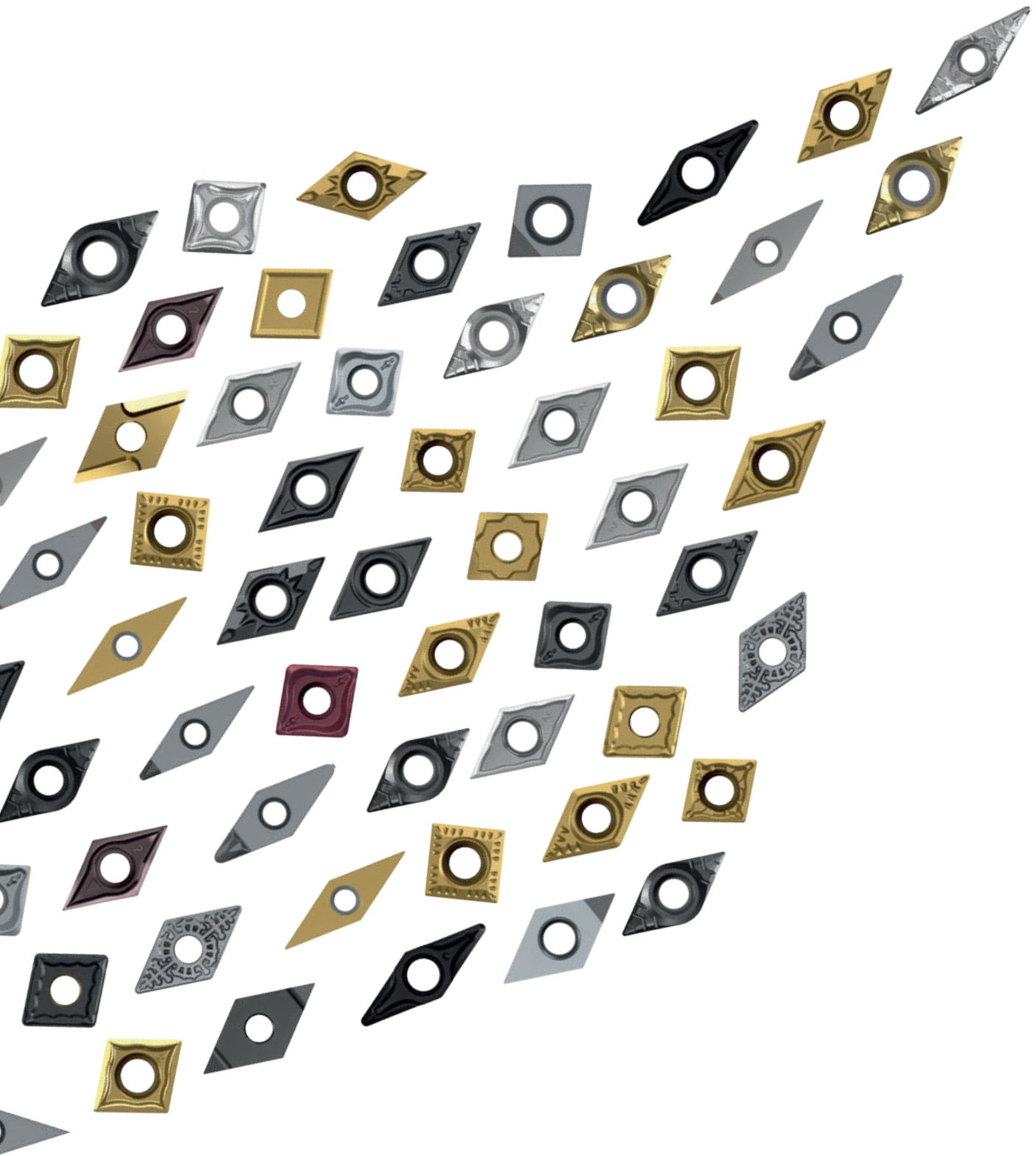
of indexable inserts from ARNO.

Everything from a single source – as a complete supplier, ARNO has the right insert for every task

Top quality with every insert – ARNO's promise from day one

Consulting included – our expert staff are always available to answer your questions





SOFT MATERIALS – SHARP EDGES.

Ideal for long-chipping materials, thin-walled components and optimal surface qualities – high-positive indexable inserts with sharp edge executions from ARNO.

Are you looking for extremely easy-cutting inserts? Then you've come to the right place! The variety of high-positive indexable inserts offered by ARNO is unique anywhere in the world. As is the quality. All our high-positive indexable inserts are made from an ultrafine grain substrate, precision ground and feature a polished chip-breaker.

For tailor-made machining of soft materials such as aluminium you can choose between different coated or uncoated types, geometries, standard and intermediate sizes and corner radii from 0.05 to 3.0 mm. Additional coatings are also available for the machining of steels and stainless steels and, if required, we also offer rounded variants with an extremely long tool life. No matter which of our high-positive indexable inserts you opt for, unsurpassed surface qualities and precise results are guaranteed.



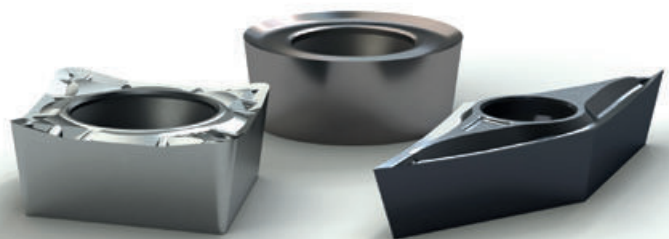
CUTTING-EDGE BENEFITS

of our high-positive indexable inserts (sharp version)

Largest range of high-positive geometries in the world

Top quality thanks to precision grinding

Extremely sharp and smooth flutes for low cutting forces



High-positive indexable inserts for additional applications.

ASF, ACB, AWI and ALU inserts are not only the solution for long-chipping materials. With the right coating, they are perfect for finishing steel and stainless steel. For exotic materials, the inserts can be additionally edge-honed.



ARNO INFO // Discover our high-positive indexable inserts in our new Turning catalogue.

Grinding experts for 30 years

Around 3 million indexable inserts are precision ground every year at ARNO. We even edge-hone the inserts in-house. The know-how we have built up over decades in this field is reflected through uncompromising cutting quality.

EXOTIC MATERIALS – SHARP SOLUTIONS.

Ideal for fine machining of high-temperature materials and stainless steels: high-positive indexable inserts with edge-honed executions from ARNO.

Do you need to process difficult-to-cut materials such as titanium and superalloys efficiently and with high precision? We have the solution: our high-positive indexable inserts with edge-honed executions. They are sharp enough to minimise the cutting force and, thanks to edge-honing, they also offer excellent edge stability. They are also optimally prepared for the poor thermal conductivity of exotic materials by means of suitable high-tech coatings.

The alternative for exotic materials: sintered inserts with special geometries from ARNO.

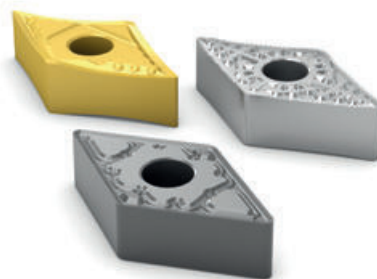
The negative NFT, NMT and NMT1 geometries are reliable, cost-effective problem-solvers for easier cutting and even roughing. The positive PMT1 geometry is optimised for the medium machining of super alloys. The new PSF geometry in AM5115 and AM5125 is for finishing thin-walled components. All are ideal for tough material thanks to excellent notch-wear and heat resistance. The special geometries ensure excellent chip control and thus absolute process reliability.

Always a sound choice for long tool life when working with exotic materials: ARNO carrier tools with through-tool coolant – the edge is effectively cooled and chips are optimally removed.



Keep things nice and smooth when it comes to exotic materials

The high-positive ASF, ACB, AWI and ALU geometries with edge-honed inserts in combination with appropriate coatings are ideal for difficult-to-machine materials such as titanium and high-temperature super alloys. superalloys.



The specialists for when things get rough

Whether Inconell or Hasteloy – high-temperature alloys and superalloys can be machined safely with our NFT, NMT and NMT1 geometries. These inserts shine even at high temperatures and with tough materials due to their extreme endurance.



ARNO INFO // Precision-sintered indexable inserts with PSF geometry for thin-walled components.



EFFICIENT BENEFITS

of ARNO indexable inserts for exotic materials

Long tool life thanks to excellent heat and notch-wear resistance

Avoidance of waste via safe processes and precise machining

Large selection – negative specialists for finishing to roughing, high-positive indexable inserts for superfinishing

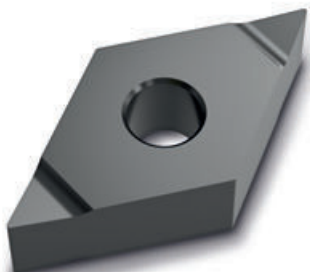
THIS IS WHERE HARD MEETS HARD.

For highest quality surfaces and maximum productivity with hardened materials: CBS indexable inserts from ARNO.

Why hard turning? Because it is very efficient, guarantees extreme tool life and excellent surface qualities, and protects the environment. Why ARNO? Firstly, because our coated CBN inserts stand out due to their incredible hardness (up to 65 HRC) and heat resistance, which is achieved via an even distribution of CBN grain and binder as well as a high degree of purity. And secondly, because ARNO offers the optimum solution for every application via seven insert types and two chamfer designs – even for extremely hard materials and the highest cutting speeds.

Ideal for hardened steel up to 52 HRC: the AH4205 type from ARNO.

If you are looking for a cost-effective alternative for hard turning, look no further – the type AH4205 is ideal for steels up to 52 HRC. Especially when combined with the NFS geometry, this type achieves the highest surface qualities down to RA 0.2 μm with excellent tool life. This is due to the very hard base substrate, a PVD multilayer coating, excellent wear and temperature resistance as well as optimum chip breakage and evacuation.



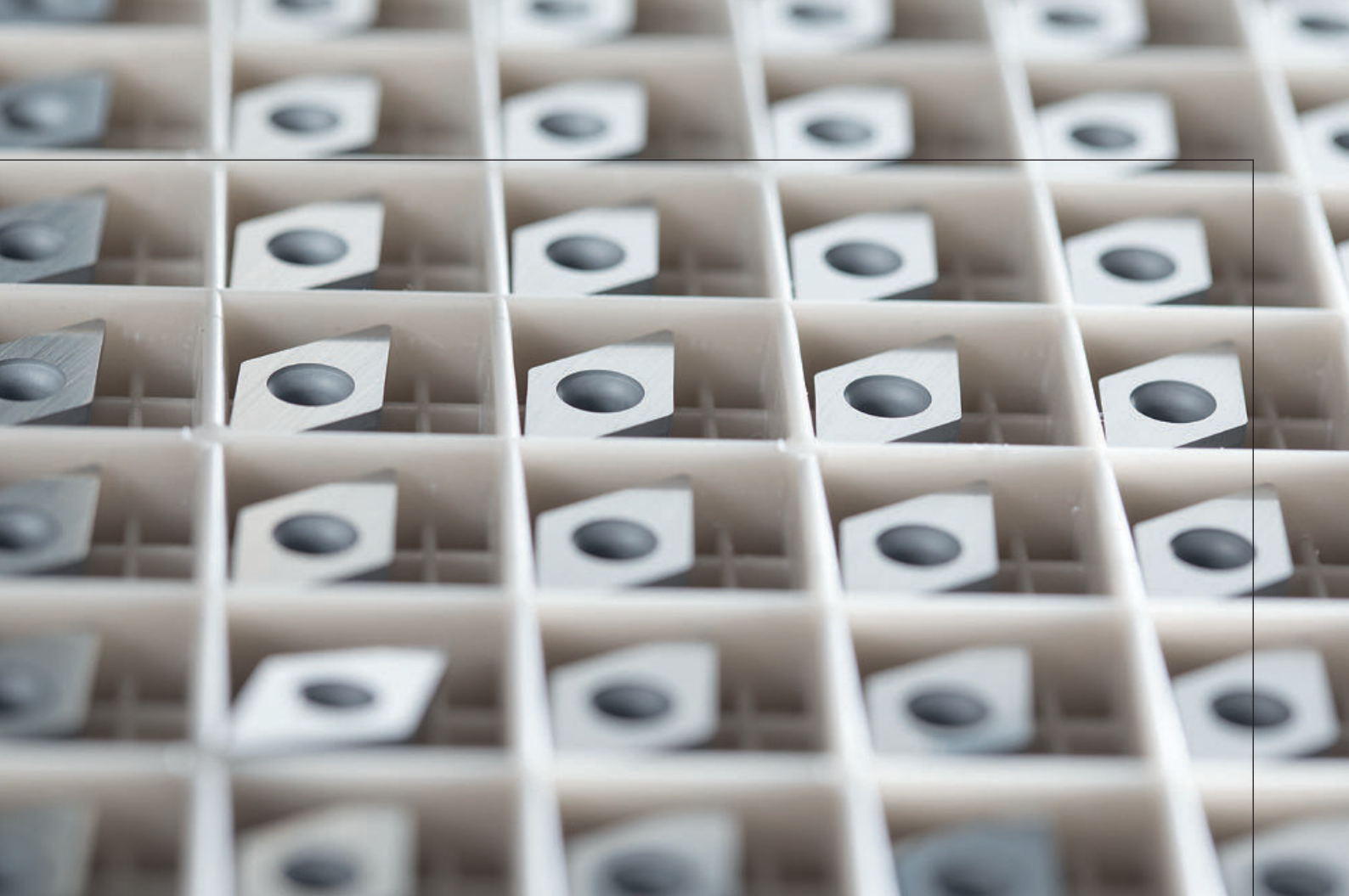
The alternative to finishing hardened steels

For perfect surface finishes on steels up to 52 HRC, we also offer a combination of the NFS chip-breaker and AH4205 type.



Coated CBN types – yes, we've thought of everything

From high-speed to varied cutting speeds and interrupted cuts – anything is possible with ARNO's CBN indexable inserts.



ARNO DIGITAL // We'll be glad to advise you on selecting the right insert to meet you requirements.



STRONG BENEFITS

of CBS indexable inserts from ARNO

Harder – different cutting depths or interrupted cuts are processed efficiently and maximum tool life is achieved

Faster – excellent surface finish and the tightest dimensional tolerances in record time

More flexible – with seven CBN types and the AH4205, we have the right cutting material for every challenge

GLEAMING PROSPECTS.

The optimum solution for greater speed when processing non-ferrous metals – PKD indexable inserts from ARNO.

Perfect for challenging applications such as alloy wheels – diamond indexable inserts from ARNO. They are consistently accurate, even at high cutting speeds or with interrupted cuts. The material is extremely resistant to abrasion and prevents the formation of built-up edges. With the corresponding laser-cut chip-breakers, all application steps can be carried out, from roughing to polish turning.

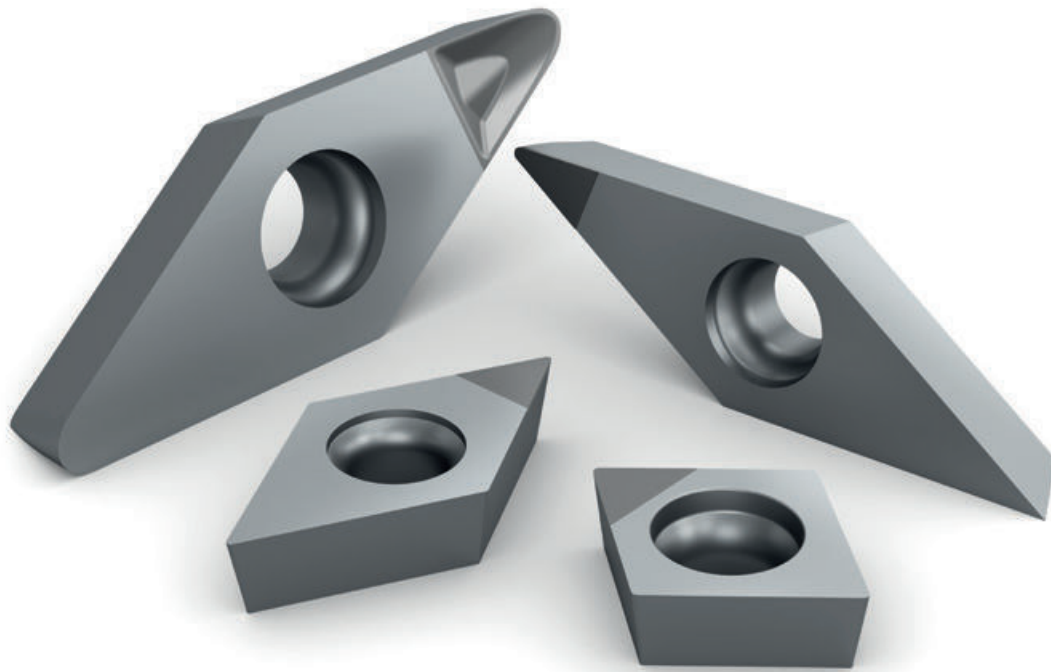


With diamond and laser for the perfect finish

Easy and efficient step-by-step machining of alloy wheels? No problem with the PKD indexable inserts with laser-cut chip-breaker from ARNO.

Everything you need for wheel machining

In cooperation with OCHEL Werkzeugproduktions GmbH, ARNO Werkzeuge offers a complete tool system for machining alloy wheels. For more info, visit drehen.arno.de



ARNO DIGITAL // Refer to our Turning catalogue for all coated inserts.



RAPID BENEFITS

of PKD indexable inserts from ARNO.

Time – extreme speeds of up to V_c 4000 are achievable

Strength – extremely abrasion-resistant material for maximum tool life

Mirror finish – excellent surface qualities

THE GOAL IS **A**LWAYS THE PERFECT EDGE!

Interview: Thomas Zeiträg, Head of Carbide Processing at ARNO Werkzeuge, discusses the finer points of grinding inserts.

For a medium-sized tool manufacturer, ARNO has a really large grinding shop. Why is this topic so important at ARNO?

We are specialists in demanding machining tasks where excellent inserts are required. We focus on this in the grinding shop – we give each edge the finishing touch, as it were. This fine tuning has a huge impact on the quality of the tools. That's why we do it ourselves. When we started doing this 30 years ago, we did the same thing. At the time, most of the other tool manufacturers weren't focusing on this issue and certainly didn't work with the kind of precision that we demand.

Does that mean that ARNO's standards for its inserts are particularly high?

Absolutely. For us, the requirement is to achieve a maximum chipping depth of 4–6 µm. I'm not aware of any other manufacturer that follows equally stringent criteria. We offer corner radii from 0.05 mm – which is hard to find elsewhere. To achieve this, you have to work very, very precisely and that is expensive. Most of them are afraid of it. It's different with us, our goal is always the perfect edge. We don't want to be the biggest, we want to deliver the best quality. That's why we have such an excellent reputation in medical technology, for example. We leave nothing to chance and, in addition to our precise processes, we also implement 100%

quality control. Every single insert that leaves our company is put through its paces using state-of-the-art measuring technology. Only if everything is just right do we let our tools prove their worth to our customers.

How does the customer benefit from such a perfect edge?

In a nutshell: less waste and optimum surfaces on the workpiece – at the first attempt. Wherever accuracy is a priority, the customer benefits from precision-ground inserts. In addition, the tool life of the inserts is increased, there is reduced formation of built-up edges and the edges are more stable overall. As a result, this also reduces both tooling costs and set-up times.

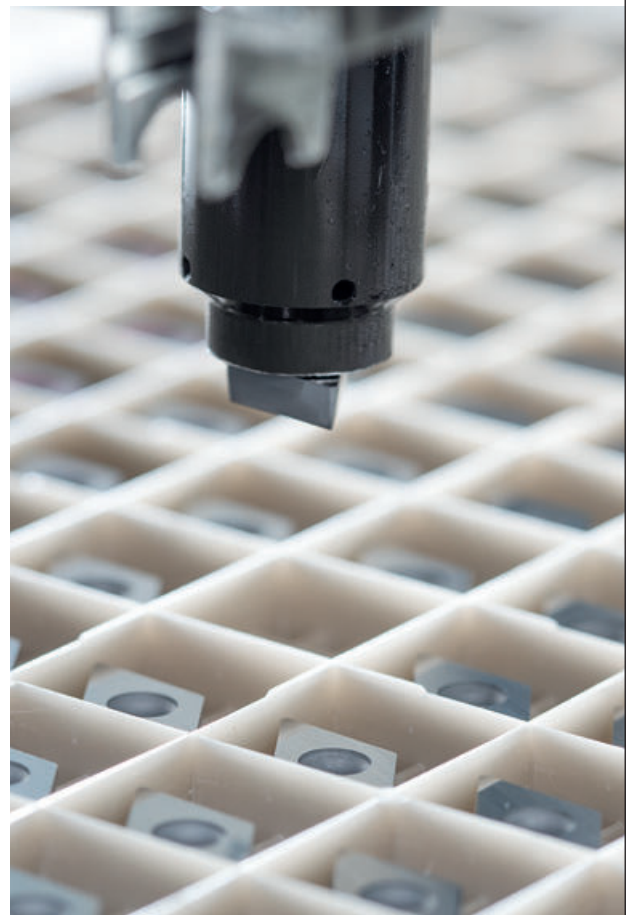
What are the key factors when grinding to ensure a perfect insert?

The optimal interaction of all parameters. In other words, which machine do I have, which program is running, which grinding wheel is being used with which grain size, how often and how much should I dress, how fast are the dressing and grinding wheels, and so on. I can only achieve an optimal edge finish and surface roughness if everything is correct. It takes a lot of know-how and experience to know which set screws you need to adjust. That's why we train ourselves to ensure we are optimally prepared, both now and in the future.



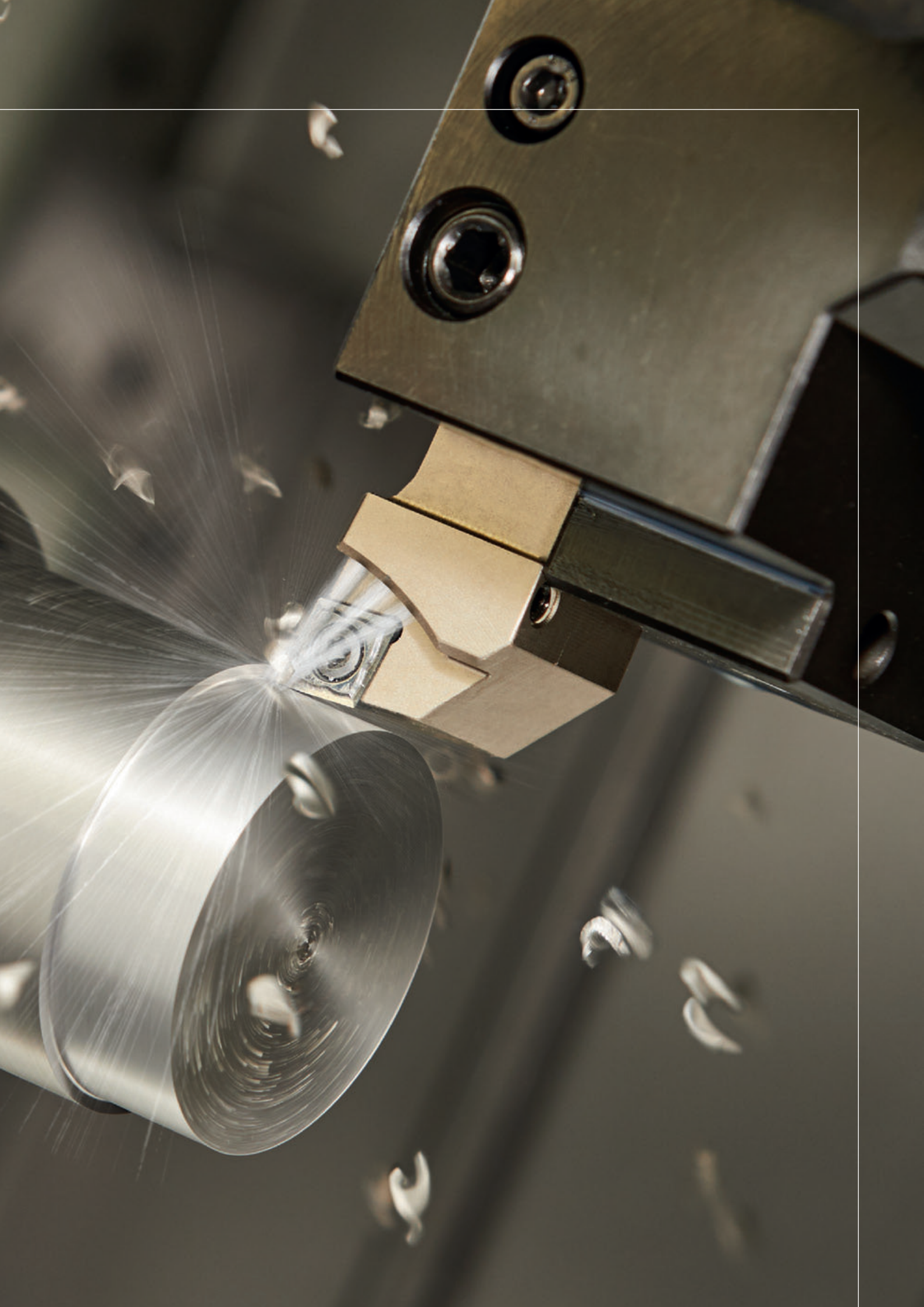
Are there innovations in the grinding sector that customers can benefit from?

Of course, a lot is happening in the field of grinding. We work closely with machine and grinding-wheel manufacturers to further expand our know-how advantage and also to work more efficiently. The demand for ground inserts is constantly increasing as ever more sophisticated materials are being used. We already grind around three million inserts per year. So we need solutions that allow us to achieve our perfect ARNO edge in as short a time as possible. That's why we recently expanded our fleet of machines. With the new generation of machines, the grinding wheel remains permanently clean while at the same time the removal rates are doubled. Of course, this will ultimately benefit our customers – through consistent top quality at fair prices and fast shipping, despite growing demand.

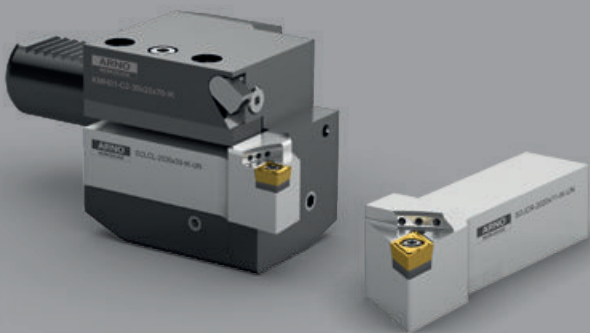


"100% quality control: every insert that leaves our company is inspected."

**ALWAYS RUNNING
SMOOTHLY – ARNO
SYSTEMS FOR TURNING.**



AT A GLANCE: OUR SOLUTIONS FOR TURNING.



Turning holders | External machining
Page 32



Boring bars | Internal machining
Page 34



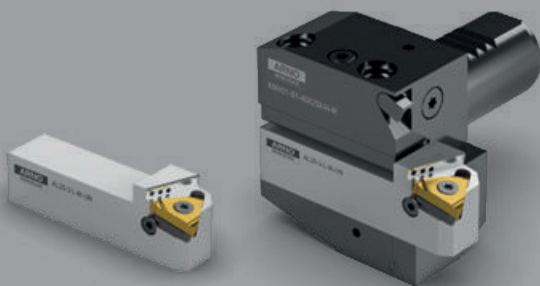
SHARK CUT | Multi-purpose tool
Page 40



AMS – ARNO Mini-System | Internal machining
Page 36



SIM | Internal machining
Page 38



Thread cutting
Page 42

VAST SELECTION, OUTSTANDING DURABILITY.

Wide variety and high quality with a precise fit – tool holders from 8x8 to 32x32 mm.

Look no further for the right KMH holders and tool holders for your requirements – with or without through-tool coolant, for almost every machine type, with different clamping systems and angles, in many sizes and with variably positionable coolant connections for all products in the ARNO SpecialDesign range. Special holders are also available.

Despite all these options one thing always remains the same: the quality. All ARNO holders are fully nickel plated and made from high quality, extremely tensile, carefully processed material. This means they are particularly robust and durable. At the same time, the tool life of these indexable inserts is significantly increased thanks to the associated precise and stable insert seat. Special markings make it easier to install the holders with through-tool coolant, thus ensuring reproducible processes and an optimal chip flow.



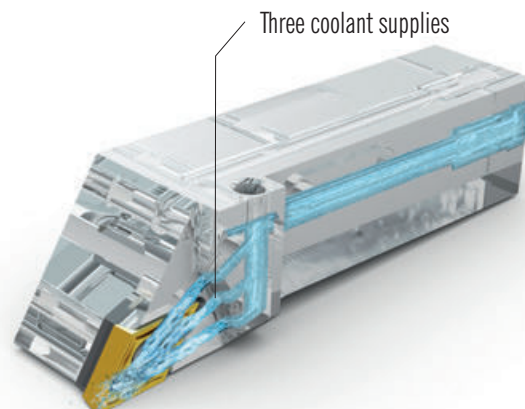
MULTIPLE BENEFITS

with ARNO tool holders

Large selection – suitable for almost every machine and requirement

Nickel plated, high tensile strength, precisely machined – top quality guarantees longevity

Process reliability through simple mounting of holders with through-tool coolant



Quality & comfort

- Completely nickel plated for increased longevity and precision
 - Scaling for length adjustment
 - **Ideal for Swiss type machining:** simple and fast tool changes with AFC – ARNO Fast Change Holders.
- Visit langdrehen.arno.de/en for more details



Flexible, down to the last detail

- Diverse clamping systems
- Available with or without through-tool coolant
- Sizes from 8x8 to 32x32 mm
- Huge range of work angles
- ARNO SpecialDesign: for easy adjustment of the length and coolant supply



Indexable inserts

- From roughing to super-fine finishing
- The right insert for all material types
- Different geometries and types for every application
- The world's largest range of high-positive indexable inserts

DIVERSE INNER QUALITIES.

Whether small or large diameter, the ARNO system for internal grooving guarantees smooth processes and high quality.

For internal grooving you can always depend on ARNO quality. Whether you need boring bars made of steel or solid carbide, with or without through-tool coolant, ARNO has you covered. With a wide variety of clamping holders and work angles, we have the optimum solution for every requirement. And of course, for every diameter – our ISO boring bars are available with shank diameters from 8 mm to 40 mm. In combination with the matching mini indexable inserts from ARNO, you can effortlessly machine down to D_{\min} 4.8 mm.

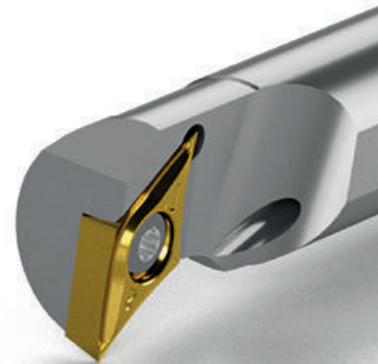


COMPREHENSIVE BENEFITS of the ARNO internal grooving system

Versatile – solutions for a wide range of diameters and materials

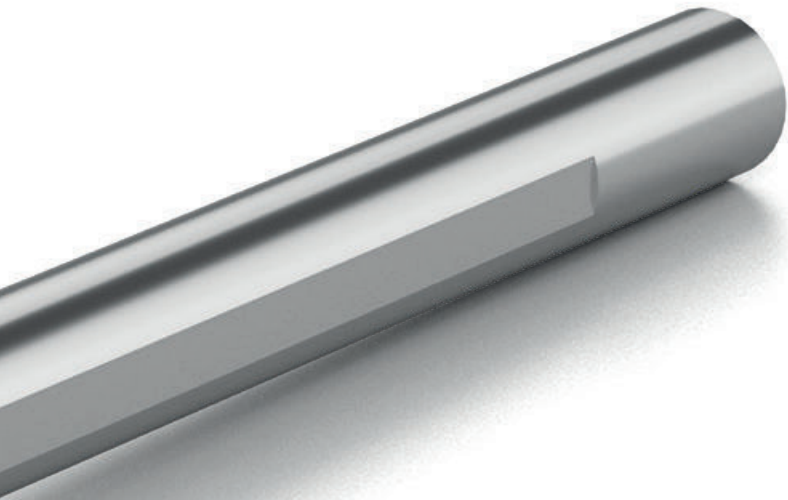
Durable – all ARNO boring bars are nickel plated and precision machined with high tensile strength

Mini dimensions – down to D_{\min} 4.8 can be machined using the products in ARNO's standard range



Boring bars

- Shanks with \varnothing 8 mm to \varnothing 50 mm
- In right or left design
- From D_{\min} \varnothing 4.8 mm
- With or without through-tool coolant
- Steel or solid carbide boring bars
- With claw clamping / toggle clamping or screw clamping
- For indexable inserts with positive or negative shape



CENTRING MADE EASY.

Modular and precise: the ARNO Mini-System AMS for internal machining starts at a diameter of 0.7 mm and reaches drilling depths of up to 50 mm.

Rigid centring, guaranteed tip height and absolute dimensional accuracy – it's so easy with AMS for flexible drilling operations with small diameters.

Here's how it works: the insert is clamped rigidly in a central position by a chamfer on the shank and a conical threaded pin. A fixed stop guarantees repeatable positioning at tip height. Besides tool holders, we also offer inserts with through-tool coolant 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

For every application we can offer ten different tool holders: standard or offset, hydraulic or polygon shank, for multi spindle or Swiss type machines. They are also available with through-tool coolant for a longer tool life.



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.

UNRIVALLED STABILITY AND PRECISION.

**The optimal solution for internal machining from bore diameters of 6.7 mm:
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 the cutting forces. At the same time, you benefit from absolute repeatability of the insert positioning. Inserts are easy and fast to replace as there is only one screw.

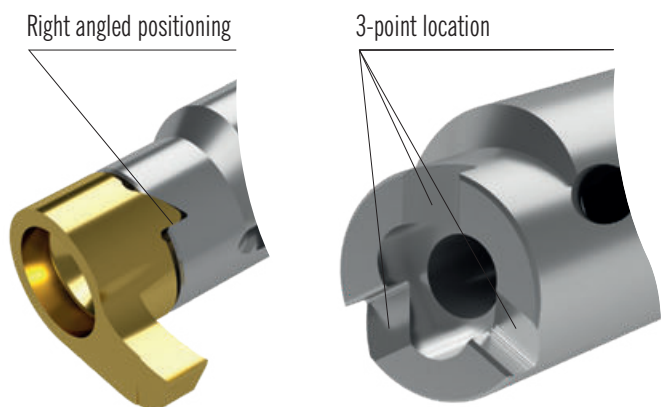


RELIABLE BENEFITS of the ARNO SIM System

Excellent rigidity and optimised force transfer
thanks to oval-shaped shank and patented 3-point
location

Absolute repeatability of cutter-head positioning

Simple and fast – replace inserts via a single
screw

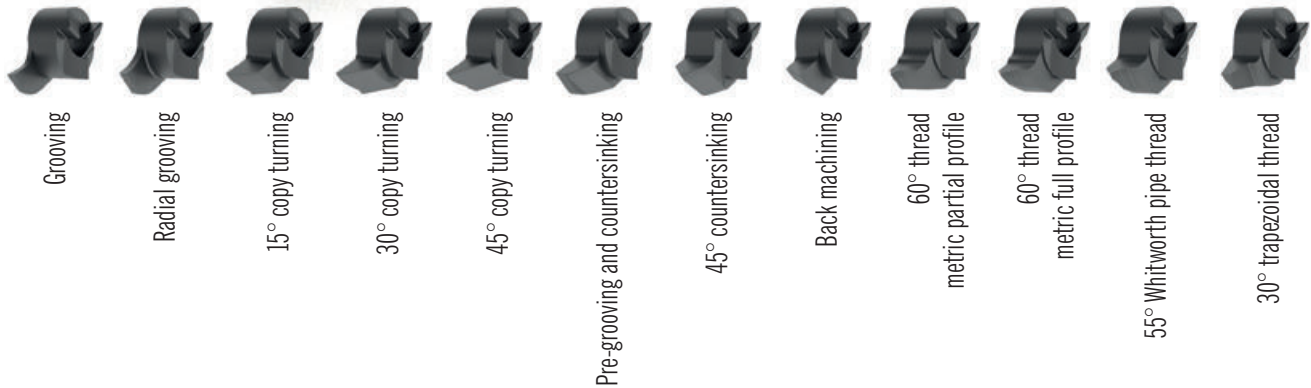


Precision strength – 3-point location with 90° positioning

Optimised force transfer guaranteed via right-angled positioning – the same applies for repeatability during insert positioning.

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 clamping flats on the shank
- Long tool life thanks to the coolant supply
- Available in steel and carbide designs – the carbide shank with its brazed steel head is vibration-damped
- Overhangs of up to 80 mm



Inserts

- Cutting depths up to 6 mm, groove widths from 0.5 to 4 mm
- PVD coating optimised for each application
- Fast and simple handling – only one screw to replace inserts

Versatile

- Copy turning
- Grooving
- Countersinking
- Back machining
- Threading
- Grooving
- Radial grooving
- SEEGER rings to DIN 471/472

MULTI-PURPOSE. MEGA PROFITABLE.

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 drilling operations without changing tool. This means you need fewer tool positions on the machine and saves space in your storage facility. In addition, programming work and presetting time are reduced – you also benefit from a flat bottom face and high surface quality.

With three variants, you are equipped for every requirement. SHARK-CUT Mini made from solid carbide from 4 mm, SHARK-CUT Standard with inserts in various geometries from 8 mm diameters, and SHARK-CUT Rebore is available with two or three cutting edges with different insert geometries from diameters of 12 or 24 mm.



VERSATILE BENEFITS

with SHARK-CUT

Economical – lower tool costs and fewer machine positions

Fast – fewer tool changes and less programming work

High quality – flat bottom surface and high surface quality



3 variants for every diameter

- SHARK-CUT Mini – carrier tool for solid-carbide tools:
ø 4 to 8 mm, 2.25 x D and 4 x D
- SHARK-CUT Standard – carrier tool for indexable inserts:
ø 8 to 32 mm, 1.5 x D, 2.25 x D and 3 x D
- SHARK-CUT Rebore – carrier tool for indexable inserts:
double-edged from ø 12 or triple-edged from ø 24, each
2.25 x D

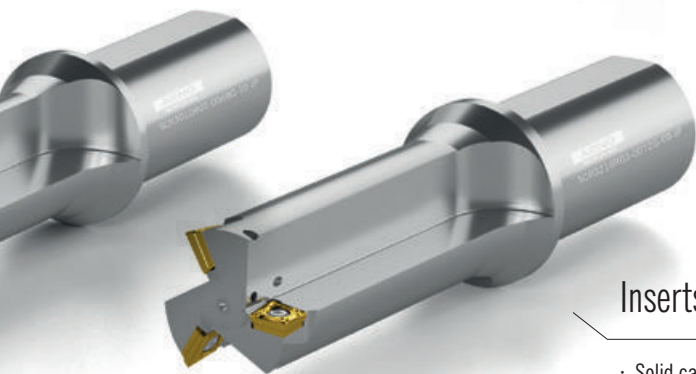


Multi-purpose

- Drilling into solid material with a flat bottom face
- Facing operations
- Turning of internal profiles
- Turning of external profiles

Inserts and indexable inserts

- Solid carbide tools: coated and uncoated
- Indexable inserts in three geometries and twelve types:
coated and uncoated, periphery ground and polished or sintered,
simple tool change with only one screw



THE BEST TOOLS FOR HIGH-ACHIEVERS.

Reliable and versatile – the ARNO thread-cutting system for all types of threads, pitches and dimensions from a core diameter of 3.2 mm.

Unsurpassed quality, process reliability and versatility – this is the promise behind the ARNO thread-cutting system. With typical ARNO quality right down to the last detail, you benefit from a long tool life and maximum precision. Whether an internal or external thread, trapezoidal or round thread, Whitworth or conical pipe thread – with the appropriate clamp holders, boring bars, indexable inserts and support plates, success is possible at the first attempt.



PRECISE BENEFITS

of the ARNO thread-cutting system

Versatile – one system that lets you create all types of threads, gradients and dimensions

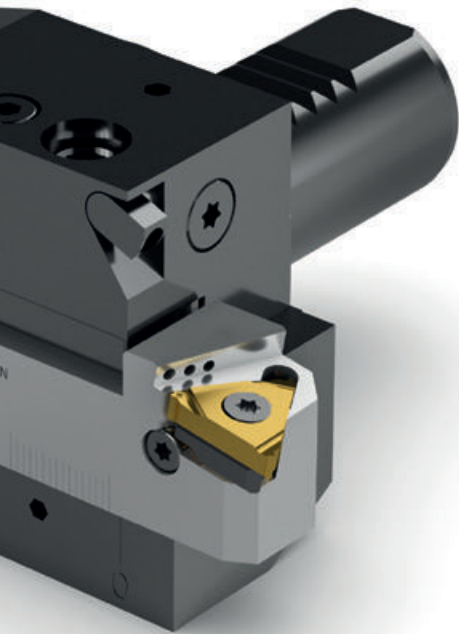
High quality – all system components in the usual ARNO quality

Economical – long tool life and precise results from the first attempt



Tool holders

- Standard design for all thread profiles / U-design for more stable indexable inserts / V-design for vertical indexable inserts
- Available with or without through-tool coolant
- Sizes from 8x8 to 50x50 mm



Boring bars

- Shanks with \varnothing 8 mm to 40 mm
- Standard design for all thread profiles / U-design for more stable indexable inserts / V-design for vertical indexable inserts / Mini 3 for D_{\min} from 9.3 mm / Mini 2 for D_{\min} from 7.3 mm
- With or without through-tool coolant
- Steel or solid carbide boring bars

Suitable for every thread

- Metric threads (ISO)
- Metric partial profile threads (60°, 55°)
- Unified ISO coarse threads (UN)
- Whitworth pipe threads (BSW, BSP)
- Conical pipe threads (BSPT)
- Trapezoidal threads (DIN 103)
- American trapezoidal threads (ACME)
- Aerospace threads (UNJ)
- Tapered (fine) pipe threads (NPT)
- Armoured steel conduit threads (DIN 40430)
- Round threads (DIN 405), custom-made

Support plates

- Tool holder with helix angle $\lambda = 1.5^\circ$
- In case of deviations in the rising angle, a corresponding support plate must be selected
- The tip height of the indexable insert remains the same regardless of the chosen support plate

Indexable inserts

- Standard version with three edges for all thread profiles
- MINI 3 with three edges for internal machining of small diameters from 9.3 mm
- MINI 2 with two edges for internal machining of small diameters from 7.3 mm
- U-design with three edges, particularly stable for threads with steep pitches
- V-design with three edges, vertical arrangement for machining large profiles, for pitches of 6–10 mm and external machining behind the collar
- SB design with three edges, sintered chip-breaker, TiAlN-coated (Al 100) for long-chipping materials

EQUIPPED FOR EVERY CHALLENGE.



Turning Systems	External machining	Internal machining	Indexable inserts
Application	ISO turning holders	ISO turning holders	Solid carbide / Cermet / CBN and PKD coated Coated or uncoated
Machining application	External machining	Internal machining	External and internal machining
Holder types	Monoblock holders	Boring bars	–
Design	R / L / neutral	R / L / neutral	Negative / Positive / High-positive
Cooling	without/with through-tool coolant	without/with through-tool coolant	–
Square shank	8 x 8 mm to 40 x 40 mm	–	–
Boring bars Ø	–	Ø 4 mm to Ø 50 mm	–
Diameter (min.)	–	as of Dmin. 4.8 mm	–
Inserts for	P / M / K / N / S / H	P / M / K / N / S / H	P / M / K / N / S / H
Others	HSK-T tool holders	HSK-T tool holders	High-positive geometries



AMS	SIM	SHARK-Cut	Thread turning
Turning / Grooving / Copy turning / Chamfering / Thread turning	Turning / Grooving / Copy turning / Chamfering / Thread turning	Multi-purpose tool for turning and drilling	For all thread types
Internal machining	Internal machining	External and internal machining	External and internal machining
Tool holder	Boring bars and square holders	Boring bars	Monoblock holders and boring bars
R / L	R / L	R / L	R / L
without/with through-tool coolant	without/with through-tool coolant	with through-tool coolant	without/with through-tool coolant
12 x 12 mm	12 x 20 mm	-	8 x 8 mm to 50 x 50 mm
Ø 12 mm to Ø 25 mm	Ø 12 mm to Ø 16 mm	Ø 6 mm to Ø 40 mm	Ø 10 mm to Ø 50 mm
as of Dmin. 0.7 mm	as of Dmin. 6.7 mm	as of Dmin. 4 mm	as of Dmin. 7.3 mm
P / M / K / N / S / H	P / M / K / N / S / H	P / M / K / N / S	P / M / K / N / S
PSC / Machine-specific holders	CBN at customer's request	Boring tools	Thread holders with UN interface



The challenge lies in maintaining the required accuracy for each and every gear wheel.

High-quality print products can only be produced with a high-precision printing machine. This begins with the internal fit of the gear wheels. Each printing unit is connected to the next printing unit via the gear wheel, which is optimally adjusted via the gear train. Unless the internal fit is exact to within one-thousandth of a millimetre, the toothing will not mesh correctly with the next gear wheel. Machines containing a larger number of printing units require a correspondingly larger number of gears, making the degree of precision even more important. This has a decisive effect on the quality of the high-gloss magazines with print finishing and high-quality printed packaging that are produced using Heidelberg sheet-offset printing machines. Unless the gears fit exactly into one another, positional deviations of the passing paper sheets will negatively affect the print quality.

The gear wheels of a printing machine can have diameters of up to 1.20 m. In terms of manufacturing, the partners intend to continue their development work in the future in order to optimise the use of cutting tools.

Photo: Andreas Knopf and Niklas Kellner from Heidelberg on the gear wheel, Thomas Ament and Volker Gaber from ARNO Werkzeuge.



MAXIMUM PRECISION – FOR PERFECTLY MESHED GEARS

High-precision turning operations using high-positive indexable inserts from ARNO Werkzeuge deliver the required accuracy. The gear wheels used by the company Heidelberger Druckmaschinen mesh precisely with one another, yet are produced more economically thanks to optimised processes. The new indexable inserts have also increased tool life by up to 100%.

Heidelberger Druckmaschinen AG (Heidelberg) manufactures high-precision and reliable digital and offset printing machines. For many years, it has been a major supplier and partner for the global printing industry with several production sites in Germany. The manufacturer has set itself the goal of integrating and automating its entire value-added chain for its customers, the print shops, thereby increasing their competitiveness. Heidelberg has around 11,500 employees worldwide. In Germany, highly automated and versatile high-tech machines in all format classes are manufactured in accordance with customer requirements. Heidelberg also wants to offer the best possible price/performance ratio for its customers. Its employees are encouraged to systematically review the technologies and cost-effectiveness of the components used in production. The goal is to keep workpiece costs as low as possible without affecting quality. In this context, Heidelberg only works with partners who are also constantly pushing forward further developments in this direction – partners such as ARNO Werkzeuge.

Indexable inserts as a cost-cutting tool

Harald Johann, head of work planning for cams, gears and model parts, and Andreas Knopf, technical expert for turning and tools at the company's Wiesloch-Walldorf location near Heidelberg, are responsible for the production of gear wheels for the offset printing presses. As part of an integral review of the existing production process for gear wheels, Heidelberg examined the indexable inserts being used in the turning process in detail. It concluded that these are certainly a cost-reducing factor due to their potential for increased tool life with a corresponding reduction in tool-change and calibration times. As a result of this investigation, Andreas Knopf was looking for an economically attractive alternative to the previously used indexable insert. ARNO Werkzeuge appeared to be a suitable partner – above all due to its expertise and product variety in the field of high-positive indexable inserts, which require only a minimum cutting force due to their particularly large rake angle and sharp execution. Supported by ARNO application technician Thomas Ament, Andreas Knopf attempted to use indexable insert TCGT16T308FN-ALU AL10 to carry out inside turning and finishing of gear wheels made from cast steel. The results were convincing – high-precision workpieces with good surface qualities.

Quality and know-how for tool-life increases of up to 100%

In the shortest possible time frame, the two companies developed an improved and cost-optimised workflow. Andreas Knopf feels the need to mention here that ARNO does not make empty promises. "The results we achieved in the field matched those that had been previously promised. In production, you quickly realise whether someone can actually put the theory into practice." This laid the foundation for further collaboration between Heidelberg and ARNO. A wide range

of parts were inspected and new ARNO indexable inserts tested. This necessitated the machining of parts with extremely challenging tolerances. The quality achieved was not only very good, but the new indexable inserts also increased tool lifetimes by up to 100%, even with difficult-to-produce workpieces. "From the beginning, we concentrated on the specific applications. Thanks to our many years of experience, we were confident of one thing right from the start: we can solve these problems!" says Thomas Ament.

The excellent results are mainly due to the excellent surface quality and edge finish of the indexable inserts. These are achieved by ARNO thanks to very strict quality standards during the grinding process. If necessary, the cutting edges of some insert types are edge-honed after grinding to increase their stability. Depending on the application, further increases in tool life and smoother running are achieved. A 100% inspection of all manufactured indexable inserts further underpins the quality standards at ARNO.

Enormous savings with on parts with diameters of up to 1.20m made from 600 kilos of cast iron

Quality and reliability are also important criteria at Heidelberg. With a weight of around 600 kilos, the cast iron gear wheels have a material value of several hundred euros. For this reason alone, particular attention was paid to ensuring process reliability during the testing phase. Although the previously used inserts delivered good process reliability, ARNO Werkzeuge stepped it up a gear. "This really showed us that this tool manufacturer has a lot of experience, takes particular care and applies high quality standards," says Andreas Knopf. The new indexable insert runs without problems: "We are also receiving positive feedback from the workshop about the ARNO insert. For me, it's important that new products are approved by our employees and also prove themselves in actual practice!" From his extensive experience with indexable inserts, he knows that they are prone to damage caused by cavities. This costs additional time and money – a key factor given the lot sizes at Heidelberg, which range from 50 to 500 pieces.

Fast delivery and on-site consulting are standard practice at ARNO

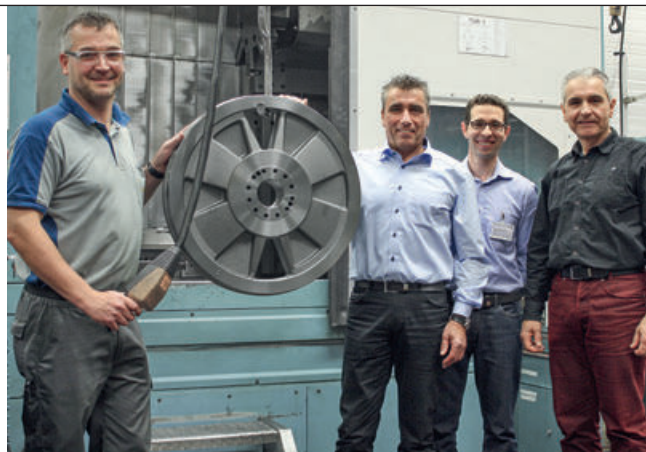
One major advantage of this particular indexable insert is that, as a standard item, it is always in stock at ARNO with only a small minimum order quantity. By contrast, the special inserts that were used previously were subject to relatively large minimum purchase quantities. Punctual delivery, the stocking of enough indexable inserts to be able to react quickly to Heidelberg's requirements, as well as generally shorter delivery times – these were all important additional factors. One month's supply of the indexable inserts can usually be delivered within three days, thanks to precise coordination be-

tween the business partners. And thanks to the proximity of ARNO as well as its flat hierarchies and uncomplicated internal structures, it is sometimes even possible to drop off a few extra inserts directly to the customer.

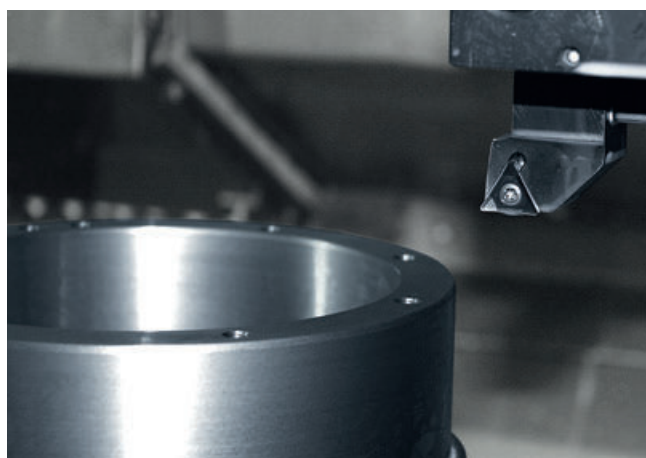
However, Harald Johann emphasises: "Even if we are already good, we want to continue to develop. How can we explore new approaches together with ARNO?" The sheer variety of high-positive indexable inserts they offer creates plenty of room for manoeuvre here. In recent years, ARNO has repeatedly introduced new coatings to the market that successfully meet the requirements for a wide variety of materials and new alloys. "Coatings and cutting-edge alignment are two areas that can still be improved in terms of the end result," explains Volker Gaber, a Sales Engineer at ARNO Werkzeuge who works closely with Heidelberg. "We have our own in-house design and development processes as well as testing machines that are used daily." New indexable inserts must first prove themselves before they are placed on the market or used in customer tests.

Together, the course is being set towards an optimised future

A broad usage range is very important for Harald Johann when it comes to developing the machines. A reduction in complexity is also a major focus. This means using fewer indexable inserts for a wider range of applications. Understandably, he also wants to minimise both the degree of utilisation and downtimes. Furthermore, for both Harald Johann and Andreas Knopf it is fundamentally important to have a partner who works alongside you on the machine on site in the search for optimisation potential. The technical expertise of its internal and field sales staff and application engineers allows ARNO to more than meet these requirements and, in collaboration with Heidelberg, to lay the optimal foundations for the future. Both companies have already demonstrated their ability to master the challenges of process and cost optimisation. Andreas Knopf emphasises the openness of all parties involved in the face of both praise and constructive criticism. Finding solutions remains everyone's focus – which is why the partnership is so successful.



Perfect teamwork: Heidelberg and ARNO Werkzeuge find solutions even for difficult-to-manufacture tolerances in the μ -range.



The high-positive TCGT indexable inserts with ALU geometry from ARNO Werkzeuge ensure optimum process reliability when machining cast steel.



ARNO SUCCESS FACTORS

for Heidelberg Druckmaschinen AG

Up to 100% longer tool life thanks to high-positive indexable inserts

Short delivery times without large minimum-order quantities

Expert advice on site for excellent results

OUTSTANDING SERVICE.

We do our utmost to help you achieve success – from comprehensive consulting by our machining experts and fast turnaround 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 your investment pays off via outstandingly efficient, reliable and straightforward production processes.



PERSONAL

At ARNO you are assigned a personal contact who provides all-round support to help optimise your production processes. An honest and fair consultation offers you genuine added value – either via regular visits to your premises or by telephone.



FAST

When time is an issue, you can rely on ARNO. If you place your order by 17.00 (on Friday by 16.00), you will receive your tool the next working day. Subject to availability. But in all cases, we achieve very short turnaround times for our custom 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.

Working for you – all over the world

Our tools are in use around the globe – that's why we are close to you no matter where you are located. You can reach us easily through our subsidiaries and distributors in many countries.



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For detailed information about our innovative systems, visit www.arno.de