

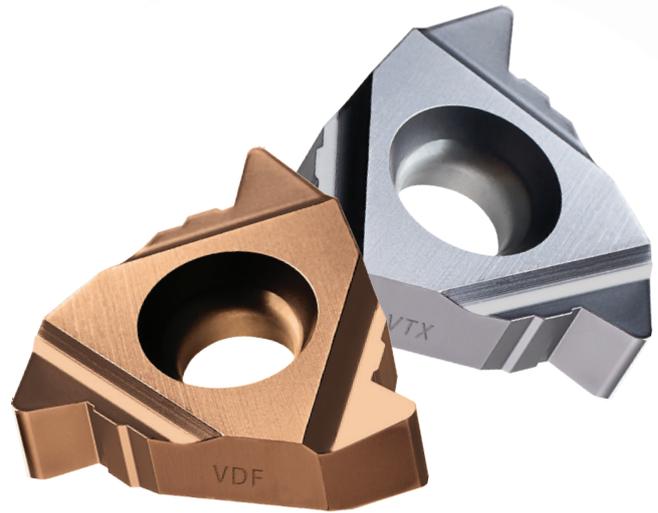
HPLINE

High Performance
Threading Inserts

METRIC

HP LINE

High Performance Threading Inserts



HP-Line System Advantages

When can you use the new HP-Line?

- **When you are facing significant problems with burr formation**
 - This eliminates the need for costly reworking such as deburring!
- **When you need a sharp yet stable cutting edge, for example with stainless materials, aluminum, etc**
 - This results in longer tool life, maximum process reliability, and increased productivity!
- **When you need to produce threads with high or above-standard quality requirements**
 - You won't need expensive special inserts, as the HP-Line is perfectly suited for tight tolerances!
 - In addition, HP-Line indexable inserts are available immediately from stock with no lead time.

Indexable Insert Sizes

HP-Line indexable inserts are available in:

- External: 3/8" (16mm), 1/2" (22mm)
- Internal 1/4" (11mm), 3/8" (16mm), 1/2" (22mm), 5/8" (27 mm)

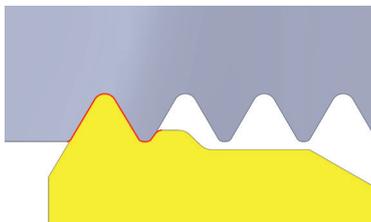
* Left-hand and Multi+ inserts are available upon request.

Thread Standards

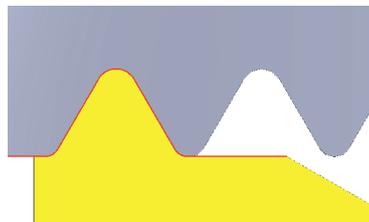
- ISO Metric
- American UN
- Whitworth BSP (G)
- NPT
- MJ
- Round Thread (RD)

*Additional thread standards are available upon request.

Profile of the HP Inserts



Profile of the Standard Inserts



The HP insert generates and overlaps the complete thread profile for improved surface finish.

HP-Line Katalog

Threading Inserts

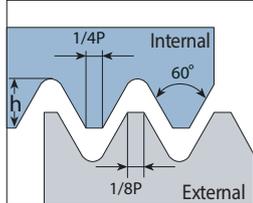
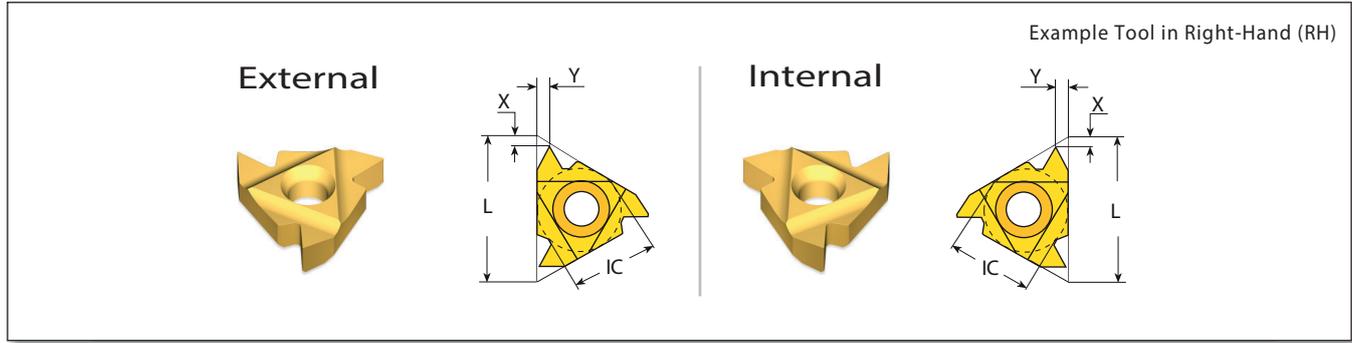
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■ Whithworth External & Internal	Page 6
■ NPT External & Internal	Page 7
■ NPTS Internal	Page 7
■ MJ External & Internal	Page 7
■ Round Thread (RD) Internal	Page 7

Toolholder

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Technical Data

■ Thread Turning Process, Helix Angle and Anvils	Page 12-13
■ Recommended Coatings and Cutting Speeds for the HP-Line	Page 14

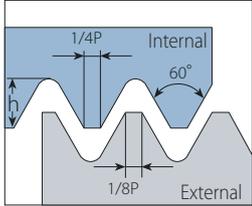
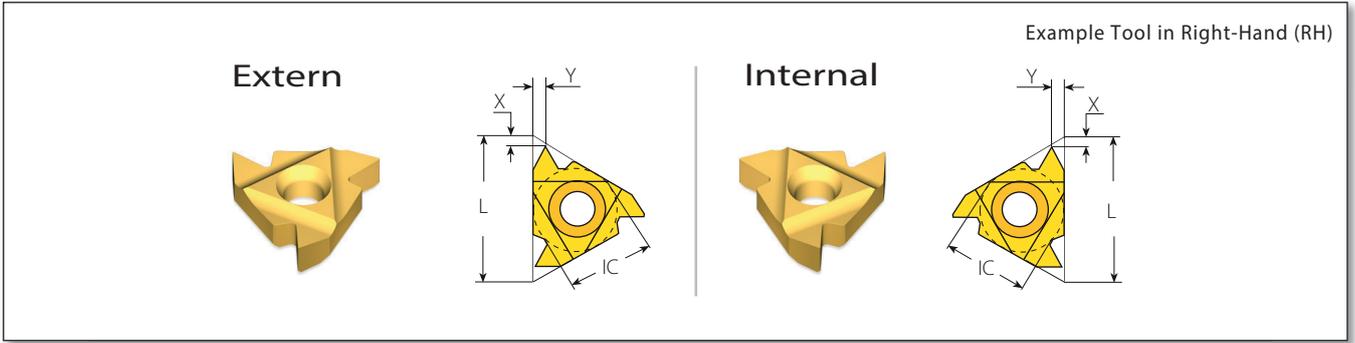


Defined by: R262
(DIN 13) Tolerance
class: 6g/6H

ISO Metric - External

Insert Size	Pitch	Ordering Code		Dimensions mm			Coatings			Anvil		Toolholder		
		IC	L mm	mm	RH	LH	h min	X	Y	VDF	VTX		VK2P	RH
1/4"	11	0.40	2HPER0.4ISO			0.23	0.6	0.3	•	•	○	-	-	NL...-2
		0.50	2HPER0.5ISO			0.30	0.6	0.3	•	•	○			
		0.60	2HPER0.6ISO			0.35	0.6	0.5	•	•	○			
		0.70	2HPER0.7ISO			0.43	0.7	0.6	•	•	○			
		0.75	2HPER0.75ISO			0.44	0.7	0.6	•	•	○			
		0.80	2HPER0.8ISO			0.45	0.6	0.4	•	•	○			
		1.00	2HPER1.0ISO			0.59	0.6	0.4	•	•	○			
		1.25	2HPER1.25ISO			0.73	0.8	0.8	•	•	○			
		1.50	2HPER1.5ISO			0.89	0.8	0.8	•	•	○			
		1.75	2HPER1.75ISO			1.10	0.6	0.9	•	•	○			
3/8"	16	0.50	3HPER0.5ISO			0.30	1.2	0.4	•	•	•	YE3	YI3	AL...-3(LH)
		0.70	3HPER0.7ISO			0.42	1.2	0.6	•	•	○			
		0.75	3HPER0.75ISO			0.45	1.2	0.6	•	•	○			
		0.80	3HPER0.8ISO			0.46	1.2	0.6	•	•	○			
		1.00	3HPER1.0ISO	3HPEL1.0ISO		0.60	1.2	0.7	•	•	•			
		1.25	3HPER1.25ISO			0.74	1.2	0.8	•	•	•			
		1.50	3HPER1.5ISO	3HPEL1.5ISO		0.90	1.2	1.0	•	•	•			
		1.75	3HPER1.75ISO			1.12	1.2	1.0	•	•	•			
		2.00	3HPER2.0ISO	3HPEL2.0ISO		1.20	1.2	1.3	•	•	•			
		2.50	3HPER2.5ISO			1.50	1.2	1.3	•	•	•			
1/2"	22	3.00	3HPER3.0ISO			1.80	1.2	1.6	•	•	○	YE4	YI4	AL...-4
		3.50	3HPER3.5ISO			2.10	1.2	1.8	•	•	○			
		3.50	4HPER3.5ISO			2.10	1.2	2.5	•	•	○			
		4.00	4HPER4.0ISO			2.40	1.2	2.5	•	•	○			
		4.50	4HPER4.5ISO			2.70	1.2	2.5	•	•	○			
		5.00	4HPER5.0ISO			3.00	1.2	2.5	•	•	○			
6.00	4HPER6.0ISO			3.60	1.2	2.7	•	•	○					

• on stock ○ Available on request

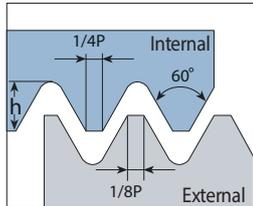
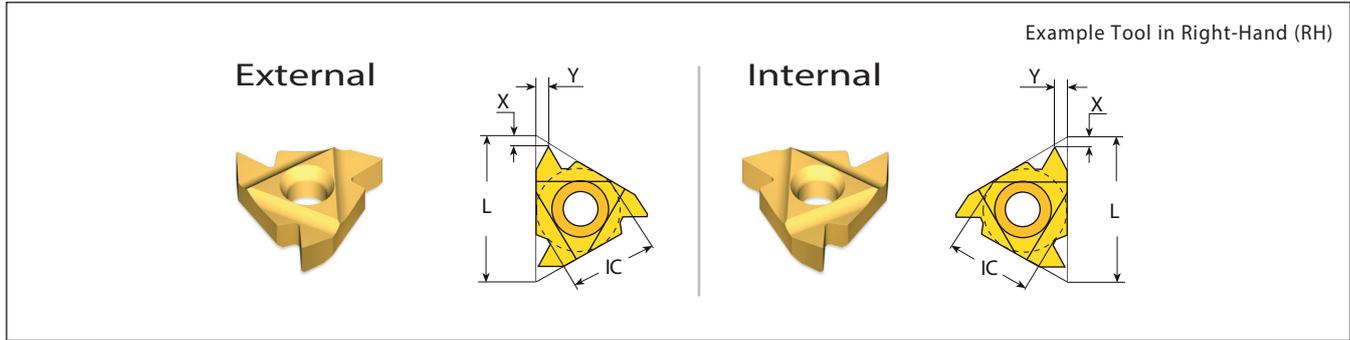


Defined by: R262
(DIN 13) Tolerance
class: 6g/6H

ISO Metric - Internal

Insert	Size	Pitch	Ordering Code		Dimension mm			Coating			Anvil		Toolholder
			RH	LH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
1/4"	11	0.50	2HPIR0.5ISO		0.27	0.8	0.4	•	•	○	-	-	NVR...-2
		0.70	2HPIR0.7ISO		0.34	0.8	0.6	•	•	○			
		0.75	2HPIR0.75ISO		0.41	0.8	0.6	•	•	○			
		0.80	2HPIR0.8ISO		0.44	0.8	0.6	•	•	○			
		1.00	2HPIR1.0ISO		0.55	0.8	0.7	•	•	○			
		1.50	2HPIR1.5ISO		0.82	0.8	0.8	•	•	○			
		2.00	2HPIR2.0ISO		1.10	0.8	1.0	•	•	○			
3/8"	16	0.50	3HPIR0.5ISO		0.27	1.2	0.4	•	•	•	Y13	YE3	AVR...-3(LH)
		0.70	3HPIR0.7ISO		0.34	1.2	0.6	•	•	○			
		0.75	3HPIR0.75ISO		0.45	1.2	0.6	•	•	○			
		0.80	3HPIR0.8ISO		0.44	1.2	1.0	•	•	○			
		1.00	3HPIR1.0ISO	3HPIL1.0ISO	0.56	1.2	0.7	•	•	•			
		1.25	3HPIR1.25ISO		0.69	1.2	1.0	•	•	○			
		1.50	3HPIR1.5ISO	3HPIL1.5ISO	0.83	1.2	1.0	•	•	•			
		1.75	3HPIR1.75ISO		0.94	1.2	1.0	•	•	•			
		2.00	3HPIR2.0ISO		1.10	1.2	1.0	•	•	•			
		2.50	3HPIR2.5ISO		1.38	1.2	1.5	•	•	○			
		3.00	3HPIR3.0ISO		1.65	1.2	1.5	•	•	○			
1/2"	22	3.50	3HPIR3.5ISO		1.90	1.2	1.5	•	•	•	Y14	YE4	AVR...-4
		3.50	4HPIR3.5ISO		2.17	1.6	2.5	•	•				
		4.00	4HPIR4.0ISO		2.21	1.6	2.5	•	•				
		4.50	4HPIR4.5ISO		2.48	1.6	2.5	•	•				
		5.00	4HPIR5.0ISO		2.76	1.6	2.5	•	•				
		5.50	4HPIR5.5ISO		2.85	1.6	2.4	•	○				
		6.00	4HPIR6.0ISO		3.31	1.6	2.5	•	•				

• on stock ○ Available on request



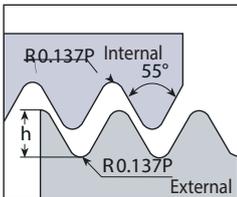
Defined by: ANSI B1.1
Tolerance class: 2A/2B

American UN | External

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	Tool Holder
3/8"	16	8	3HPER8UN	1.91	1.2	1.50	•	•	○	YE3	YI3	AL...-3(LH)
		11	3HPER11UN	1.46	1.2	1.20	•	•	○			
		12	3HPER12UN	1.27	1.2	1.20	•	•	○			
		14	3HPER14UN	1.15	1.2	1.00	•	•	○			
		16	3HPER16UN	1.02	1.2	1.00	•	•	○			
		18	3HPER18UN	0.90	1.2	1.00	•	•	○			
		20	3HPER20UN	0.81	1.2	0.80	•	•	○			

American UN | Internal

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	Tool Holder
1/4"	11	12	2HPIR12UN	1.12	0.765	1	•	•	○	-	-	NVR...-2
		14	2HPIR14UN	1.06	0.765	1	•	•	○			
3/8"	16	11	3HPIR11UN	1.28	1.56	1	•	•	○	YE3	YI3	AVR...-3(LH)
		12	3HPIR12UN	1.12	1.15	1	•	•	○			
		14	3HPIR14UN	1.06	1.15	1	•	•	○			
		16	3HPIR16UN	0.93	1.15	0.8	•	•	○			
		18	3HPIR18UN	0.83	1.15	1	•	•	○			
		20	3HPIR20UN	0.70	0.87	0.6	•	•	○			



Defined by: B.S.84:1956,
DIN 259, ISO228/1:1982
Tolerance class:
Medium class A

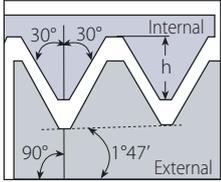
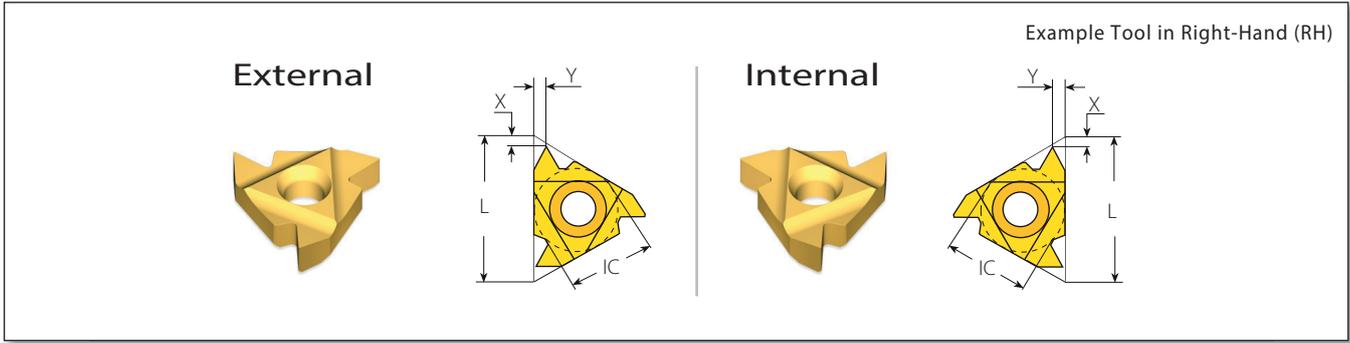
Whitworth | External

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	Tool Holder
3/8"	16	11	3HPER11W	1.44	1.2	1.5	•	•	○	YE3	YI3	AL...-3(LH)
		12	3HPER12W	1.40	1.17	1.2	•	•	○			
		14	3HPER14W	1.40	1.17	1.2	•	•	•			
		16	3HPER16W	1.06	1.17	1.2	•	•	○			
		18	3HPER18W	0.89	1.17	1.1	•	•	○			
		19	3HPER19W	0.83	1.17	1	•	•	•			
		28	3HPER28W	0.61	1.17	0.75	•	•	○			

Whitworth UN | Internal

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	Tool Holder
1/4"	11	12	2HPIR12W	1.37	0.86	1.1	•	•	○	-	-	NVR...-2(LH)
		14	2HPIR14W	1.10	1.15	1.1	•	•	○			
		16	2HPIR16W	1.03	0.96	1.1	•	•	○			
		18	2HPIR18W	0.86	0.86	0.8	•	•	○			
		19	2HPIR19W	0.81	1.15	1	•	•	○			
3/8"	16	11	3HPIR11W	1.41	1.15	1.5	•	•	•	YE3	YI3	AVR...-3(LH)
		12	3HPIR12W	1.37	1.15	1.1	•	•	○			
		14	3HPIR14W	1.10	1.2	1.2	•	•	•			
		16	3HPIR16W	1.03	1.15	1.1	•	•	○			
		18	3HPIR18W	0.86	0.85	0.85	•	•	○			
		19	3HPIR19W	0.81	1.15	1	•	•	•			

• On stock ○ Available on request



Defined by:
USAS B2.1:1968
Tolerance class:
Standard NPT

NPT | External

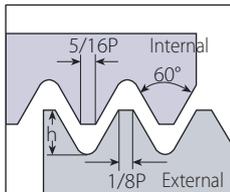
Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
3/8"	16	8	3HPER8NPT	2.39	1.17	1.65	•	•	○	YE3	YI3	AL...-3
		11.5	3HPER11.5NPT	1.67	1.17	1.2	•	•	○			
		14	3HPER14NPT	1.37	1.17	1	•	•	○			
		18	3HPER18NPT	1.06	1.17	0.8	•	•	○			
		27	3HPER27NPT	0.71	1.17	0.8	•	•	○			

NPT | Internal

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
3/8"	16	8	3HPIR8NPT ○	2.38	1.3	1.65	•	•	○	YI3	YE3	AVR...-3
		11.5	3HPIR11.5NPT	1.63	1.15	1.2	•	•	○			
		14	3HPIR14NPT	1.34	1.15	1.2	•	•	○			
		18	3HPIR18NPT	1.01	0.87	1	•	•	○			
		27	3HPIR27NPT	0.68	0.85	0.6	•	•	○			

NPTS | Internal

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
3/8"	16	11.5	3HPIR11.5NPS	1.66	0.97	1.2	•	○	○	YI3	YE3	AVR...-3
		14	3HPIR14NPS	1.32	0.87	1	•	○	○			



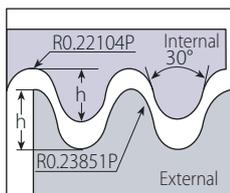
Defined by: ISO 5855
Tolerance class:
4h/6h-4H/5H

MJ | External

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
3/8"	16	1.0	3HPER1.0MJ	0.55	1	0.7	•	•	○	YE3	YI3	AL...-3
		1.5	3HPER1.5MJ	0.82	1	1	•	•	○			

MJ | Internal

Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
3/8"	16	1.0	3HPIR1.0MJ	0.50	1	0.7	•	•	○	YI3	YE3	AVR...-3
		1.5	3HPIR1.5MJ	0.76	1	1	•	•	○			



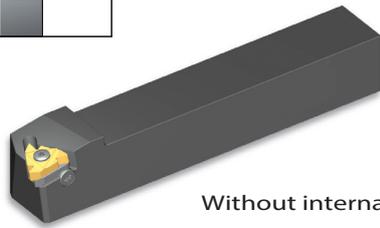
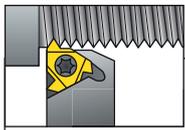
Defined by: DIN 405
Tolerance class: 7h/7H

RD | Internal

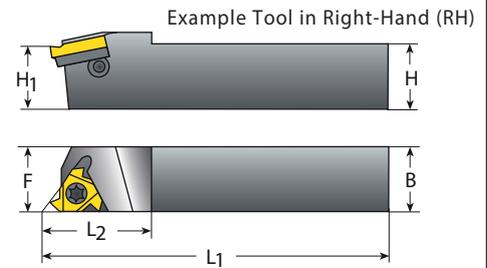
Insert Size		Pitch	Ordering Code	Dimension mm			Coating			Anvil		Tool Holder
IC	L mm	TPI	RH	h min	X	Y	VDF	VTX	VK2P	RH	LH	
1/2"	22	6	4HPIR6RD	2.07	1.96	1.4	•	○	○	YI3	YE3	AVR...-3
		8	4HPIR8RD	1.52	1.39	1	•	○	○			
5/8"	27	4	5HPIR4RD	3.04	2.74	2.1	•	○	○	YI3	YE3	AVR...-5

On stock ○ Available on request

External Toolholders



Without internal cooling



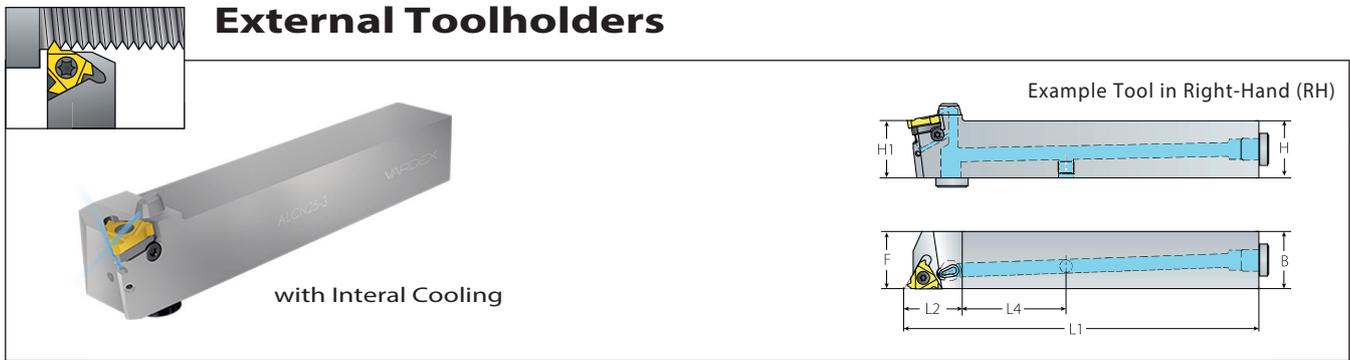
Standard | Without internal cooling

Spare Parts

Insert	Ordering Code		Dimensions in mm				Spare Parts					
	IC	RH	LH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Tox Key	Anvil RH	Anvil LH
1/4"	NL12-2	NL12-2LH		25	25	155.7	36	SN2T	–	K2T	–	–
	NL12-3	NL12-3LH		25	25	155.7	36	SA3T	–	K3T	–	–
3/8"	AL12-3	AL12-3LH		25	25	155.7	36	SA3T	SY3T	K3T	YE3	YI3
	AL16-3	AL16-3LH		32	32	175.7	36					
	AL20-3	AL20-3LH		32	34	170	30					
	AL25-3	AL25-3LH		40	40	205.7	36					
	AL32-3	AL32-3LH		12	12	83.2	22					
1/2"	AL32-4	AL32-4LH		16	16	100	20.5	SA4T	SY4T	K4T	YE4	YI4
	AL40-4	AL40-4LH		32	32	173.6	30	SA5T	SY5T	K5T	YE5	YI5
5/8"	AL25-5	AL25-5LH		25	25	155.7	30.2					
	AL32-5	AL32-5LH		25	25	153.6	30					
	AL40-5	AL40-5LH		20	20	128.6	25.1					
3/8"	AL16-3C			32	32	175.7	36					
	AL20-3C	AL20-3CLH		32	32	178.4	38					
	AL25-3C	AL25-3CLH		40	40	205.7	36					
	AL32-3C	AL32-3CLH		12	12	83.2	22					
1/2"	AL25-4C	AL25-4CLH		32	32	178.4	37	C4	SY4T	K4T	YE4	YI3
	AL32-4C	AL32-4CLH		20	20	128.6	30					
5/8"	AL40-4C	AL40-4CLH		32	32	173.6	30	C5	SY5T	K5T	YE4	YI4
	AL25-5C	AL25-5CLH		25	25	155.7	30.2					
	AL32-5C	AL32-5CLH		25	25	153.6	30					
	AL40-5C	AL40-5CLH		20	20	128.6	25.1					
	AL50-5C			12	12	125	23.9	C6	SY5T	K5T	YE5	YI5

- The above tool holders have a lead angle of 1.5°. For other lead angles, please refer to the main catalog.
- Tool holders with the prefix "N" cannot be used with a shim plate.

External Toolholders

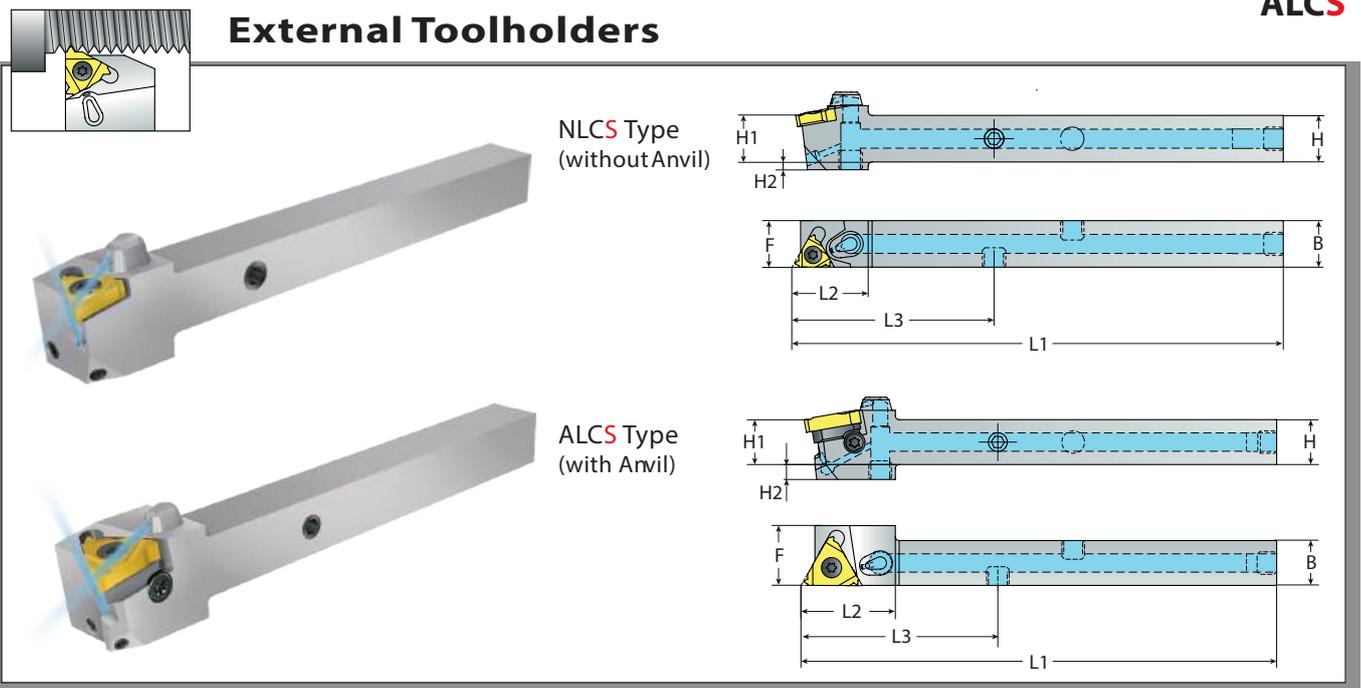


Standard | with Internal Cooling

Insert Size	Ordering Code		Dimensions mm					Spare Parts								
	IC	RH	LH	H=H1=B	F	L1	L2	L4	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	Coolant Jet	Anvil Screw	
3/8"	ALCN16-3	ALCN16-3LH		16	16	100.0		25	25.1	SA3T	SY3T	K3T	YE3	YI3	G1/8"	M6x5
	ALCN20-3	ALCN20-3LH		20	20	127.0		30								
	ALCN25-3	ALCN25-3LH		25	25	155.0		35								
	ALCN32-3	ALCN32-3LH		32	32	175.0		40								
1/2"	ALCN25-4	ALCN25-4LH		25	25	155.0		35	30.2	SA4T	SY4T	K4T	YE4	YI4	G1/8"	M6x5
	ALCN32-4	ALCN32-4LH		32	32	175.0		40								
5/8"	ALCN25-5	ALCN25-5LH		25	25	155.0		35	35.1	SA5T	SY5T	K5T	YE5	YI5	G1/8"	M6x5
	ALCN32-5	ALCN32-5LH		32	32	175.0		40								

ALCS

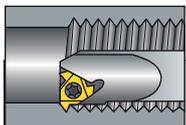
External Toolholders



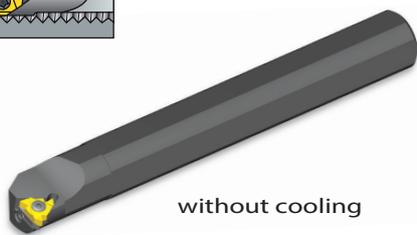
Standard with Coolant

Insert Size	Ordering Code		Dimensions mm					Market Description		Spare Parts							
	IC	RH	LH	H=H1=B	F	L1	L2	L3	H2	RH	LH	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	Plug* x 4
1/4"	NLCS10-2	NLCS10-2LH		10	12	110.7	18.8	36.7	4	NLCS10-11	NLCS10-11LH	SN2T	-	K2T	-	-	Plug M6x5
	NLCS12-2	NLCS12-2LH		12	12	125.7	18.8	51.7	2	NLCS12-11	NLCS12-11LH						
3/8"	ALCS12-3	ALCS12-3LH		12	16	125.7	23.8	51.7	4	ALCS12-16	ALCS12-16LH	SA3T	SY3T	K3T	YE3	YI3	

The above tool holders have a lead angle of 1.5°. For other lead angles, please refer to the main catalog.
 • Tool holders with the prefix "N" cannot be used with a shim plate.

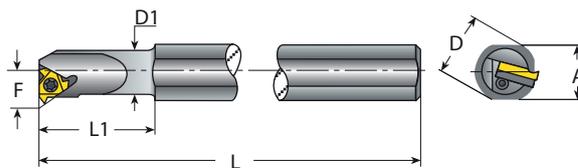


Internal Toolholders



without cooling

Example Tool in Right-Hand (RH)

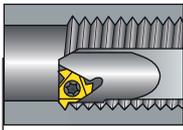


Standard | without cooling

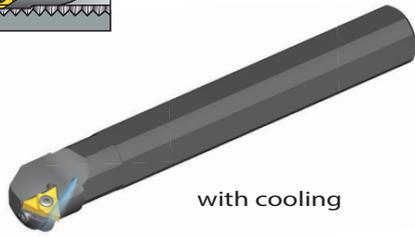
Spare Parts

Insert Size	Ordering Code		Dimension mm				Bore Dia.		Spare Parts					
	IC	RH	LH	A	L	L1 (max)	D	D1	mm	Srew	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/4"	NVR10-2	NVR10-2LH		18	180	64	10	10	13	SN2T	-	K2T	-	-
	NVR13-2	NVR13-2LH		18	180	64	20	13	16					
3/8"	NVR13-3	NVR13-3LH		18	180	150	20	13	17	SN3T	-	K3T	-	-
	NVR16-3	NVR16-3LH		18	180	100	16	16	20					
5/8"	NVR20-4	NVR20-4LH		18	180	125	20	20	27	SN4T	-	K4T	-	-
3/8"	AVR20-3	AVR20-3LH		18	180	0.98	20	20	24	SA3T	SY3T	K3T	YI3	YE3
	AVR25-3	AVR25-3LH		29	250	1.57	25	25	29					
	AVR25D-3	AVR25D-3LH		22.6	200	100	25	25	29					
	AVR32-3	AVR32-3LH		29	250	1.97	32	32	36					
	AVR40-3	AVR40-3LH		36	300	160	40	40	44					
1/2"	AVR25-4	AVR25-4LH		29	250	60	32	25	32	SA4T	SY4T	K4T	YI4	YE4
	AVR25D-4	AVR25D-4LH		22.6	200	100	25	25	32					
	AVR32-4	AVR32-4LH		29	250	128	32	32	39					
	AVR40-4	AVR40-4LH		36	300	197	40	40	47					
5/8"	AVR50-4	AVR50-4LH		45	350	200	50	50	57	SN5T	SY5T	K5T	YI5	YE5
	AVR32-5	AVR32-5LH		29	250	128	32	32	40					
	AVR40-5	AVR40-5LH		36	300	160	40	40	48					
	AVR50-5	AVR50-5LH		45	350	200	50	50	58					
3/8"	AVR20-3C	AVR20-3CLH		18	180	80	20	20	24	C3	SY3T	K3CT	YI3	YE3
	AVR25-3C	AVR25-3CLH		28	250	60	32	25	29					
	AVR25D-3C	AVR25D-3CLH		22.6	200	100	25	25	29					
	AVR32-3C	AVR32-3CLH		29	250	128	32	32	36					
	AVR40-3C	AVR40-3CLH		36	300	160	40	40	44					
1/2"	AVR25-4C	AVR25-4CLH		29	250	60	32	25	32	C4	SY4T	K4T	YI4	YE4
	AVR25D-4C	AVR25D-4CLH		22.6	200	128	25	25	32					
	AVR32-4C	AVR32-4CLH		29	250	128	32	32	39					
	AVR40-4C	AVR40-4CLH		36	300	160	40	40	47					
5/8"	AVR32-5C	AVR32-5CLH		29	250	128	32	32	40	C5	SY5T	K5T	YI5	YE5
	AVR40-5C	AVR40-5CLH		36	300	160	40	40	48					
	AVR50-5C	AVR50-5CLH		45	350	200	50	50	58					
	AVR60-5C	AVR60-5CLH		54	400	240	60	60	69					

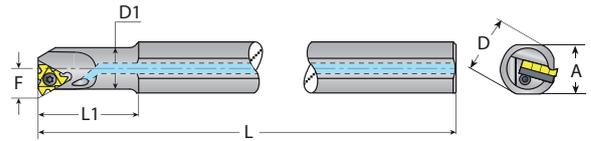
- The above tool holders have an angle of inclination of 1.5°.
- For further angles of inclination: see main catalog.
- For additional clamp holders, please refer to the main catalog.
- Clamp holders with the prefix "N" cannot be used with a shim plate.



Internal Toolholders



Example Tool in Right-Hand (RH)



Standard | with cooling

Spare Parts

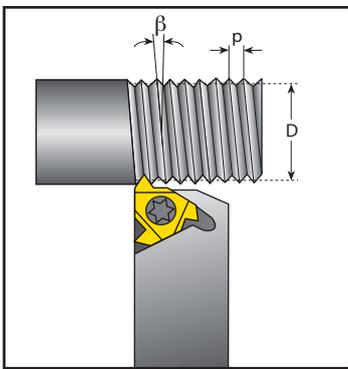
Insert Size	Ordering Code		Dimension mm						Bore Dia. mm	Spare Parts				
	IC	RH	LH	A	L	L1 (max)	D	D1		Screw	Schraube für Unterlegplatte	Torx Schlüssel	Unterlegplatte RH	Unterlegplatte LH
1/4"	NVRC10-2	NVRC10-2LH		18	180	50	10	10	13	SN2T	-	K2T	-	-
	NVRC13-2	NVRC13-2LH		18	180	150	20	13	13					
3/8"	NVRC13-3	NVRC13-3LH		18	180	100	20	13	17	SN3T	-	K3T	-	-
	NVRC16-3	NVRC16-3LH		18	180	120	16	16	24					
5/8"	NVRC20-4	NVRC20-4LH		18	180	150	20	20	27	SN4T	-	K4T	-	-
3/8"	AVRC20-3			18	180	125	20	20	24	SA3T	SY3T	K3T	YI3	YE3
	AVRC25-3	AVRC25-3LH		29	250	100	32	25	29					
	AVRC25D-3	AVRC25D-3LH		22.6	200	100	25	25	29					
	AVRC32-3	AVRC32-3LH		29	250	128	32	32	36					
	AVRC40-3	AVRC40-3LH		36	300	160	40	40	44					
1/2"	AVRC25-4	AVRC25-4LH		29	250	60	32	25	32	SA4T	SY4T	K4T	YI4	YE4
	AVRC32-4	AVRC32-4LH		29	250	128	32	32	39					
	AVRC40-4	AVRC40-4LH		36	300	160	40	40	47					
	AVRC50-4	AVRC50-4LH		45	350	60	50	50	57					
5/8"	AVRC32-5	AVRC32-5LH		29	250	160	32	32	40	SA5T	SY5T	K5T	YI5	YE5
	AVRC40-5	AVRC40-5LH		36	300	160	40	40	48					
	AVRC50-5	AVRC50-5LH		45	350	200	50	50	58					
	AVRC60-5	AVRC60-5LH		54	400	1.5	60	60	69					
3/8"	AVRC20-3C	AVRC20-3LH		18	180	80	20	20	24	C3	SY3T	K3CT	YI3	YI3
	AVRC25-3C			28	250	8	25	25	29					
	AVRC32-3C			29	250	80	32	32	36					
	AVRC40-3C			36	300	160	40	40	44					
1/2"	AVRC25D-4C			22.6	200	160	25	25	32	C4	SY4T	K4T	YI4	YE4
	AVRC32-4C	AVRC32-4CLH		29	250	8	32	32	39					
	AVRC40-4C	AVRC40-4CLH		36	300	160	40	40	47					
5/8"	AVRC40-5C			36	300	160	40	40	48	C4	SY4T	K4T	YI4	YE4
	AVRC60-5C			54	400	40	60	60	69					

- The above tool holders have an angle of inclination of 1.5°.
- For further angles of inclination: see main catalog.
- For additional clamp holders, please refer to the main catalog.
- Clamp holders with the prefix "N" cannot be used with a shim plate.

Thread Turning Methods for Symmetrical Inserts

Thread	Inserts & Toolholder	Rotation	Feed Direction	Helix Method	Drawing No.
Right Hand External	EX RH	Counterclockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN RH	Counterclockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counterclockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counterclockwise	From chuck	Reversed	8

Calculating the Helix Angle β



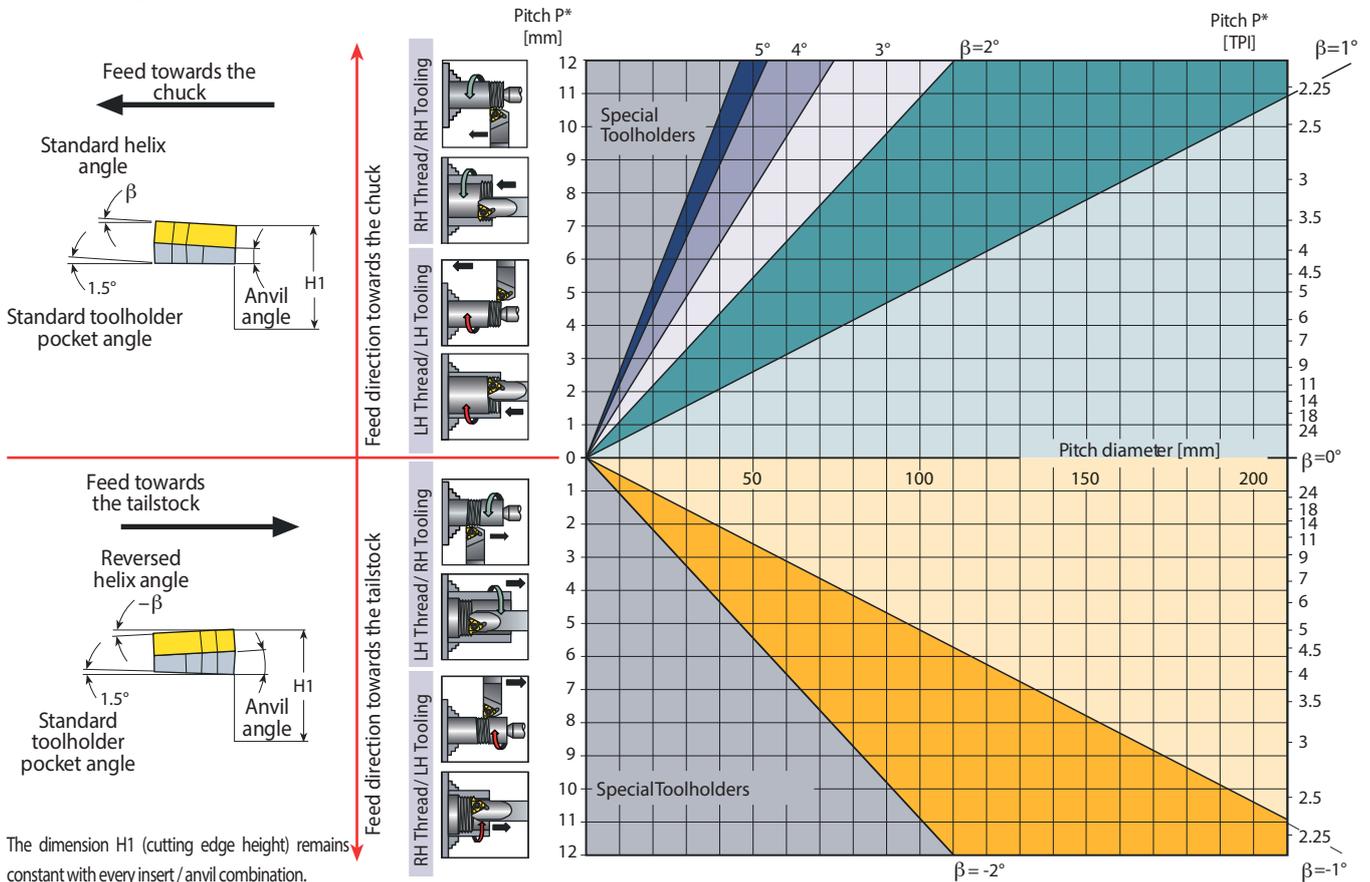
The helix angle is calculated by the following formula:

$$\beta = \arctan \frac{P \times N}{\pi \times D}$$

β - Helix angle [°]
 P - Pitch [mm]
 N - No. of starts
 D - Pitch diameter [mm]
 Lead = P x N

The helix angle can also be found from the diagram below.

Helix Angle Diagram

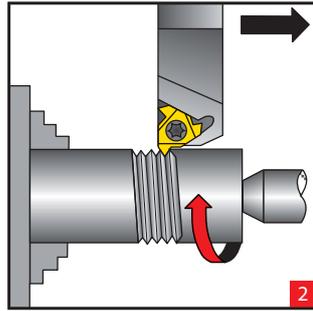
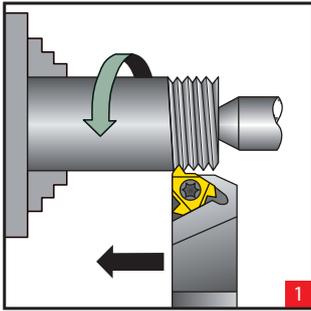


* For Multi-start threads, use the lead value instead of the pitch

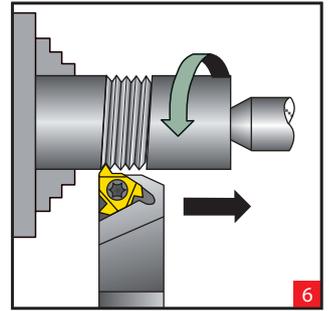
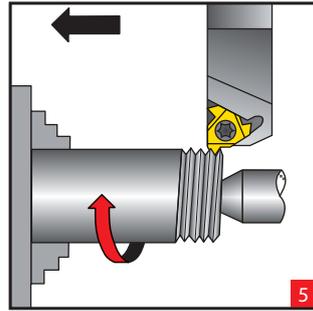
Thread Turning Methods for Symmetrical Inserts

(Continuation)

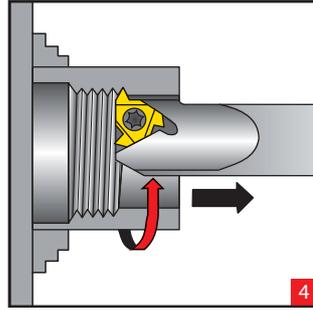
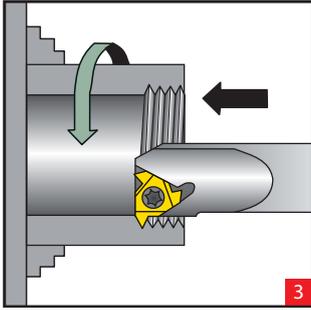
External RH Thread



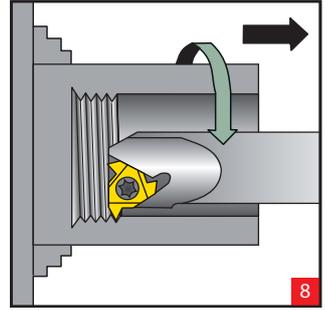
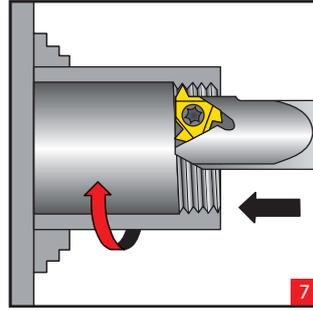
External LH Thread



Internal RH Thread



Internal RH Thread



Anvils

Resultant Helix Angle		4.5°		3.5°		2.5°		1.5°		0.5°		0°		-0.5°		-1.5°	
Insert Size		Holder		Ordering Code													
IC	L mm																
3/8"	16	ER / IL	YE3-3P	YE3-2P	YE3-1P	YE3	YE3-1N	YE3-1.5N	YE3-2N	YE3-3N							
		EL / IR	YI3-3P	YI3-2P	YI3-1P	YI3	YI3-1N	YI3-1.5N	YI3-2N	YI3-3N							
3/8" V6	16	ER	YE3-6C-3P	YE3-6C-2P	YE3-6C-1P	YE3-6C	YE3-6C-1N	YE3-6C-1.5N	YE3-6C-2N	YE3-6C-3N							
		IR	YI3-6C-3P	YI3-6C-2P	YI3-6C-1P	YI3-6C	YI3-6C-1N	YI3-6C-1.5N	YI3-6C-2N	YI3-6C-3N							
1/2"	22	ER / IL	YE4-3P	YE4-2P	YE4-1P	YE4	YE4-1N	YE4-1.5N	YE4-2N	YE4-3N							
		EL / IR	YI4-3P	YI4-2P	YI4-1P	YI4	YI4-1N	YI4-1.5N	YI4-2N	YI4-3N							
1/2" ^F	23	ER	YE4F-3P	YE4F-2P	YE4F-1P	YE4F	YE4F-1N	YE4F-1.5N									
		IR	YI4F-3P	YI4F-2P	YI4F-1P	YI4F	YI4F-1N	YI4F-1.5N									
1/2" ^U	22	ER / IL	YE4U-3P	YE4U-2P	YE4U-1P	YE4U	YE4U-1N	YE4U-1.5N	YE4U-2N	YE4U-3N							
		EL / IR	YI4U-3P	YI4U-2P	YI4U-1P	YI4U	YI4U-1N	YI4U-1.5N	YI4U-2N	YI4U-3N							
5/8"	27	ER / IL	YE5-3P	YE5-2P	YE5-1P	YE5	YE5-1N	YE5-1.5N	YE5-2N	YE5-3N							
		EL / IR	YI5-3P	YI5-2P	YI5-1P	YI5	YI5-1N	YI5-1.5N	YI5-2N	YI5-3N							
5/8" ^U	27	ER / IL	YE5U-3P	YE5U-2P	YE5U-1P	YE5U	YE5U-1N	YE5U-1.5N	YE5U-2N	YE5U-3N							
		EL / IR	YI5U-3P	YI5U-2P	YI5U-1P	YI5U	YI5U-1N	YI5U-1.5N	YI5U-2N	YI5U-3N							
3/8" ^{M+}	16	ER / IL				YE3M-1P	YE3M	YE3M-1N	YE3M-1.5N	YE3M-2N							
		EL / IR				YI3M-1P	YI3M	YI3M-1N	YI3M-1.5N								
1/2" ^{M+}	22	ER / IL				YE4M-1P	YE4M	YE4M-1N	YE4M-1.5N	YE4M-2N							
		EL / IR				YI4M-1P	YI4M	YI4M-1N	YI4M-1.5N								
1/2" ^F 2M+	23	ER				YE4M2F-1P	YE4M2F	YE4M2F-1N	YE4M2F-1.5N								
1/2" ^F 3M+						YE4M3F-1P	YE4M3F	YE4M3F-1N	YE4M3F-1.5N								
1/2" ^F 2M+						YI4M2F-1P	YI4M2F	YI4M2F-1N	YI4M2F-1.5N								
5/8" ^{M+}	27	ER / IL				YE5M	YE5M-1N	YE5M-1.5N									
		EL / IR				YI5M	YI5M-1N	YI5M-1.5N									
1/2" ^{Z+}	22	ER / IL				YE4Z-1P	YE4Z	YE4Z-1N									
		EL / IR				YI4Z-1P	YI4Z	YI4Z-1N									
1/2" ^{T+}	22	ER / IL EL / IR							Y4T								

HP-LINE Recommended Grades and Cutting Speeds Vc [m/min] Not Including MiniPro Line

Material Group	Vargus	Material	Hardness Brinell HB	Vc [m/min]		
				Coated		Uncoated
				VTX	VDF	VK2(P)
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	130-210	140-230
	2		Medium Carbon (C=0.25-0.55%)	150	110-190	120-210
	3		High Carbon (C=0.55-0.85%)	170	100-180	110-200
	4	Low Alloy Steel (alloying elements ≤5%)	Non Hardened	180	110-200	120-215
	5		Hardened	275	80-150	90-170
	6		Hardened	350	75-150	85-160
	7	High Alloy Steel (alloying elements >5%)	Annealed	200	85-130	95-145
	8		Hardened	325	55-110	60-120
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	75-140	85-155
	10		High Alloy (alloying elements <5%)	225	65-130	70-145
M Stainless Steel	11	Stainless Steel Ferritic		200	75-140	85-155
	12		Hardened	330	65-130	70-140
	13	Stainless Steel Austenitic	Austenitic	180	100-155	110-170
	14		Super Austenitic	200	45-120	50-130
	15	Stainless Steel Cast Ferritic	Non Hardened	200	100-130	110-145
	16		Hardened	330	70-120	80-130
	17	Stainless Steel Cast Austenitic	Austenitic	200	95-120	100-130
	18		Hardened	330	65-110	70-120
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	65-75	70-85
	29		Pearlitic (long chips)	230	65-160	70-170
	30	Grey Cast Iron	Low Tensile Strength	180	75-140	85-155
	31		High Tensile Strength	260	65-125	70-135
	32	Nodular Sg Iron	Ferritic	160	140-180	150-190
	33		Pearlitic	260	100-130	110-145
N Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	110-400	120-440
	35		Aged	100	90-240	100-265
	36	Aluminium Alloys	Cast	75	220-440	240-480
	37		Cast & Aged	90	220-310	240-340
	38		Cast Si 13-22%	130	65-200	70-215
	39	Copper and Copper Alloys	Brass	90	90-250	100-270
	40		Bronze And Non Leaded Copper	100	90-280	100-310
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	50-65	55-75
	20		Aged (iron based)	280	35-55	35-60
	21		Annealed (nickel or cobalt based)	250	20-30	25-35
	22		Aged (nickel or cobalt based)	350	15-25	20-30
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	155-190	170-205
	24		α+β Alloys	1050Rm	55-75	60-85
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	50-65	55-75
	26			51-55HRc	45-55	50-60

Coating	Application	VTX
VTX	Universal coating with special strengths in machining alloyed and high-alloy steels.	

Coating	Application	VDF
VDF	Universal coating with special strengths in machining Cr-containing steels as well as stainless steels.	

Coating	Application	VK2P
VK2P	High-gloss polished version of VK2, uncoated grade for premium surface finishing in aluminum.	

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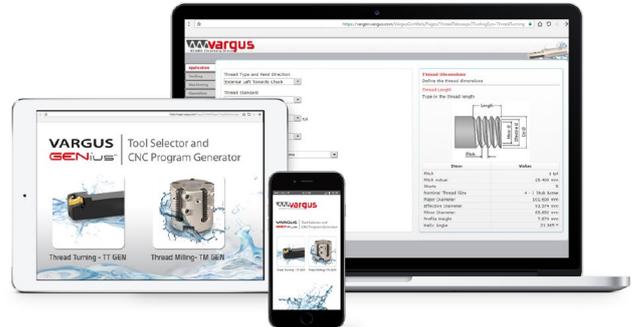


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