



NL **Snijsnelheden draaien**
 FR **Vitesse de coupe de tournage**
 ES **Velocidades de corte para tornear**
 DE **Schnittgeschwindigkeit Drehen**

		HM															
ISO	Gr.	CM10	K10	K20	HC-K10	P25	HC-P10/ K10	HC-P15	HC-P15/ M15	HC-P25	HC-P25/ M20	HC-P25/ M20/ S15	HC-P25/ M25/ K20	HC-P35	HC-P35/ M25	HC-P35/ M30	HC-M20/ K30
		Vc (m/min)															
P	11	280-350			110-160	100-140			220-400		190-290					180-230	240-210
	12	260-300			90-120	90-120			100-280	200-320	100-250	170-250	90-250	60-130	80-150	130-150	220-120
	13	260-300			90-120	90-120			100-280	200-320	100-250	170-250	90-250	60-130	80-150	130-150	220-120
	14	160-200			80-110	60-100			120-280		130-210					70-130	80-110
H	15											60-120					
M	21	230-270			90-140				220-300		140-210	80-230	80-140		140-200	120-110	150-200
	22	170-240								70-100				80-150	100-90		90-160
K	31		120-160		180-220		250-450	90-300	140-370	90-300	130-210	100-280	80-150				120-160
	32		130-170		120-180		220-380		140-270		120-200						90-130
N	41		300-2500	100-500	300-3200												
	42		400-1500	100-300	400-2000												
	51		250-600	100-300	200-1000												
	52		250-600	100-300	200-1000												
	61		80-180	80-180	80-220												
S	71				20-40												
	72				80-140							60-150					

NL **Snijsnelheden steken**
 FR **Vitesse de coupe de tronçonnage**
 ES **Velocidades de corte para tronzar**
 DE **Schnittgeschwindigkeit Stechen**

		HM			
ISO	Gr.	K15	HC-P25/ M20	HC-P35/ M25	HC-P40/ M30
P	11			140-210	90-200
	12			100-160	90-180
	13			100-160	90-180
	14		60-140	80-160	70-140
H	15				
M	21		60-130	50-90	60-80
	22				
K	31	60-180			50-140
	32	60-150			120-180
N	41	500-2000		100-500	300-3200
	42	100-400		100-300	200-1000
	51	100-400		100-300	200-1000
	52	100-400		100-300	200-1000
	61	50-700		80-180	80-220
S	71				20-40
	72				80-140

NL **Snijsnelheden draadsnijden**
 FR **Vitesse de coupe de filetage**
 ES **Velocidades de corte para roscar**
 DE **Schnittgeschwindigkeit Gewindeschneiden**

		HM			
ISO	Gr.	P30	HC-P25	HC-P25/ M20	HC-P25/ M20/ K20
P	11	70-130	80-150		115-190
	12	70-120	70-130		85-145
	13	70-120	70-130		85-145
	14	50-80	60-110		70-110
H	15				45-60
M	21	75-110		70-150	70-130
	22	70-100		40-120	40-110
K	31				70-130
	32				125-160
N	41				100-365
	42				200-400
	51				80-225
	52				80-225
	61				
S	71				20-30
	72				50-70

NL **Snijsnelheden frezen**
 FR **Vitesse de coupe de fraisage**
 ES **Velocidades de corte para fresar**
 DE **Schnittgeschwindigkeit Fräsen**

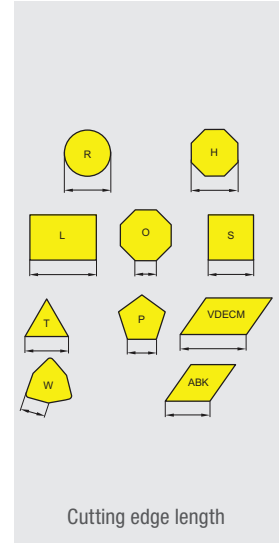
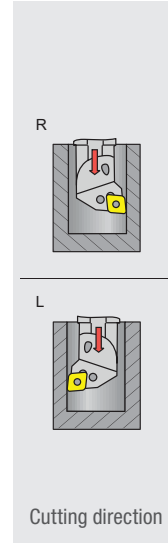
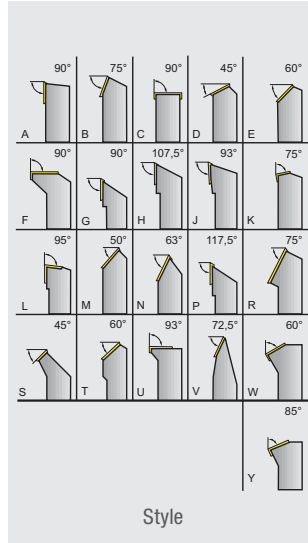
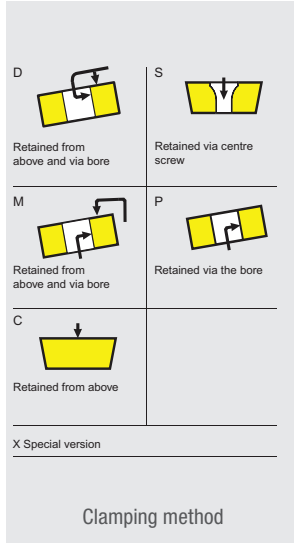
		HM				
ISO	Gr.	K10	HC-P25	HC-P20/ M20	HC-P25/ M25/ S15	HC-P30/ M25
P	11					190-280
	12		80-180	80-180	90-250	140-250
	13		80-180	80-180	90-250	140-250
	14					80-130
H	15			60-120	60-120	
M	21			80-200	80-230	
	22					
K	31				100-280	160-310
	32					130-200
N	41	100-600				
	42					
	51					
	52					
	61					
S	71			60-150	60-150	
	72					

NL ISO Wisselplaatouder inwendig draaien
 FR Porte-plaquette ISO tournage intérieur
 ES Portaplaquita ISO torneado interior
 DE ISO Klemmhalter innen drehen



S	Steel shank	E	As C with coolant hole
A	Steel shank with coolant hole	F	As C with anti-vibration system
B	Steel shank with anti-vibration system	G	As C with coolant hole and anti-vibration system
D	Steel shank with coolant hole and anti-vibration system	H	Heavy metal
C	Carbide shank with steel head	J	Heavy metal with coolant hole

Shank version



S 32 U - D C L N R 12

Shank Ø

d ₁ mm
08
10
12
16
20
25
32
40
50
60

Tool length

l ₁ mm	F
80	H
100	J
110	K
125	L
140	M
150	N
160	P
170	Q
180	R
200	S
250	T
300	U
350	V
400	W
450	Y
500	
Special length	X

Insert shape

Included angle	35°	V				
	55°	D				
	75°	E				
	80°	C				
	86°	M				
Included angle	55°	K				
	82°	B				
	85°	A				
Other shapes	90°	L	—	●	R	
	108°	P	●	90°	●	S
	120°	H	●	60°		T
	135°	O	●	80°		W

Clearance angle

3°	A	25°	F
5°	B	30°	G
7°	C	0°	N
15°	D	11°	P
20°	E		

Clearance angles not included within the standard for which particular information is necessary





NL ISO Wisselplaatouder uitwendig draaien
 FR Porte-plaquette ISO tournage extérieur
 ES Portaplaquita ISO torneado exterior
 DE ISO Klemmhalter außen drehen



D

Retained from above and via bore

M

Retained from above and via bore

C

Retained from above

X Special version

Clamping method

S

Retained via centre screw

P

Retained via the bore

A 90° **B** 75° **C** 90° **D** 45° **E** 60°

F 90° **G** 90° **H** 107,5° **J** 93° **K** 75°

L 95° **M** 50° **N** 63° **P** 117,5° **R** 75°

S 45° **T** 60° **U** 93° **V** 72,5° **W** 60°

Y 85°

Style

R

L

N

Cutting direction

B

Shank width

R **H**

L **O** **S**

T **P** **VDECM**

W **ABK**

Cutting edge length

D C L N R 25 25 - M 12

Insert shape

Included angle		35°	V				
		55°	D				
Included angle		75°	E				
		80°	C				
		86°	M				
		55°	K				
		82°	B				
Other shapes		90°	L	—	●	R	
		108°	P	●	90°	■	S
		120°	H	●	60°		T
		135°	O	●	80°		W

Clearance angle

3°	A	25°	F
	5°	B	30°
7°	C	0°	N
	15°	D	11°
20°	E		

Clearance angles not included within the standard for which particular information is necessary } O

Shank height

Tool holder	
Cartridge	
Round shank	00

Tool length

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

NL ISO Wisselplaten
FR Plaquettes ISO
ES Plaquetas ISO
DE ISO Wendeplatten



Included angle	35°	V
	55°	D
Included angle	75°	E
	80°	C
Included angle	86°	M
	55°	K
Included angle	82°	B
	85°	A
Other shapes	90°	L
	108°	P
Other shapes	120°	H
	135°	O
Other shapes	90°	S
	60°	T
Other shapes	80°	W

Insert shape

3°	A	25°	F
5°	B	30°	G
7°	C	0°	N
15°	D	11°	P
20°	E		

Clearance angle

	d ±	m ±	s ±
A	0,025	0,005	0,025
F	0,013	0,005	0,025
C	0,025	0,013	0,025
H	0,013	0,013	0,025
E	0,025	0,025	0,025
G	0,025	0,025	0,13
J	0,05-0,15*	0,005	0,025
K	0,05-0,15*	0,013	0,025
L	0,05-0,15*	0,025	0,025
M	0,05-0,15*	0,08-0,20	0,13
N	0,05-0,15*	0,08-0,20	0,025
U	0,08-0,25*	0,13-0,38	0,13

Tolerances

N	
R	
F	
A	
M, P	
G, P	
W	
T	
Q	
U	
B	
H	
C	
J	
X	Special version

Form of top surface

d mm			
mm		Inch	
06	5/32	16	3,96
08	3/8	20	5,08
10	7/16	25	6,35
12	1/2	32	8,00

Cutting edge length

Inch	mm	Index
1/16	1,59	01
3/32	2,38	02
1/8	3,18	03
5/32	3,97	T3
3/16	4,76	04
7/32	5,56	05
1/4	6,35	06
5/16	7,94	07
3/8	9,52	09

Insert thickness

Code	Corner radius mm
00	≤ 0,05
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
24	2,4
32	3,2

Corner radius

⊙ RN 00
⊙ RC MO

C N M G 12 04 08

N Negative	F Fine	1	ALU Uncoated	P Steel	10 Hard
P Positive	M Medium	6	HC Coated	M INOX	35 Tough
	R Roughing			K Cast NF	
	A Aluminium Non-Ferro			S Super Alloys	

Insert Type

Insert Index

Chipbreaker Index

Surface

ISO Index

Carbide Grade

N M 3 HC P 25






N

F

NL **Negatieve wisselplaten voor draaien**
 FR **Plaquettes négatives pour tournage**
 ES **Plaquitas negativas para torneado**
 DE **Negative Wendepplatten zum drehen**

NL **Fijn/nadraaien**
 FR **Tournage fin**
 ES **Torneado fino**
 DE **Schlichten**


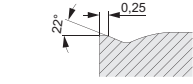
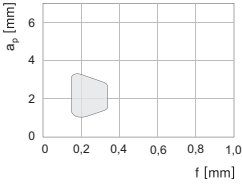




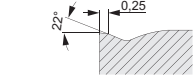
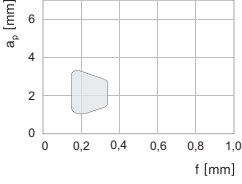




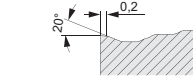
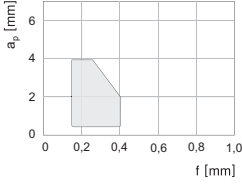




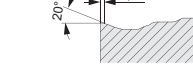
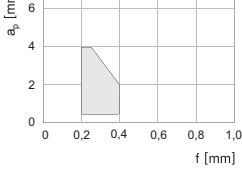



<p>NF2</p> 	 			
		HC-P15/M15 HC-P35/M25	HC-P35/M25	
		HC-P15/M15 HC-P35/M25	HC-P35/M25	
<p>NF2E</p> 	 			
		HC-P25/M20/S15 HC-P15	HC-P25/M20/S15	
		HC-P25/M20/S15	HC-P25/M20/S15	
<p>NF3</p> 	 			
		HC-P25/M20	HC-P25/M20	
		HC-P25/M20	HC-P25/M20	
		HC-P25/M20	HC-P25/M20	
<p>NF4</p> 	 			
		HC-M20/K30		
		HC-M20/K30		
		HC-M20/K30		
		HC-M20/K30		
		HC-M20/K30		

NL **Negatieve wisselplaten voor draaien**
 FR **Plaquettes négatives pour tournage**
 ES **Plaquetas negativas para torneado**
 DE **Negative Wendepplatten zum drehen**

N

NL **Middelmatige bewerking negatieve wissplaat**
 FR **Tournage semi-finition**
 ES **Torneado medio**
 DE **Mittlere Zerspantung**

M

<p>NM3E</p> 	 			
		<p>HC-P25/M20/S15</p>	<p>HC-P25/M20/S15</p>	
		<p>HC-P25/M20/S15</p>	<p>HC-P25/M20/S15</p>	
		<p>HC-P25/M20/S15</p>	<p>HC-P25/M20/S15</p>	
<p>NM3</p> 	 			
		<p>HC-P25/M20</p>	<p>HC-P25/M20 HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P15/M15</p>	<p>HC-P25/M20 HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P25/M20</p>	
<p>NM4</p> 	 			
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
<p>NM5</p> 	 			
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>




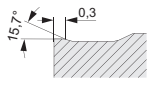
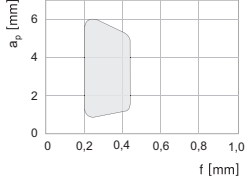




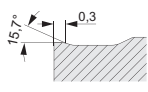
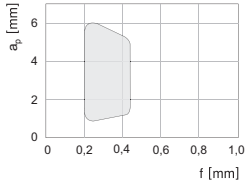




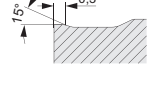
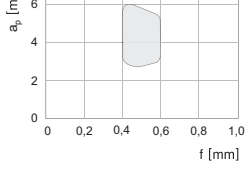




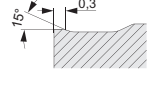
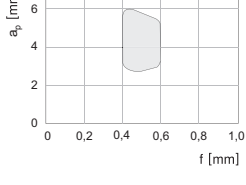





N

R

NL **Negatieve wisselplaten voor draaien**
 FR **Plaquettes négatives pour tournage**
 ES **Plaquetas negativas para torneado**
 DE **Negative Wendepplatten zum drehen**

NL **Ruwen negatieve wisselplaat**
 FR **Usinage d'ébauche**
 ES **Mecanizado en desbaste**
 DE **Schruppen**


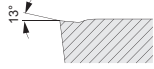
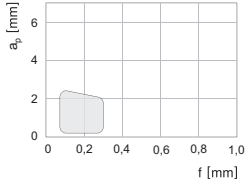




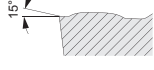
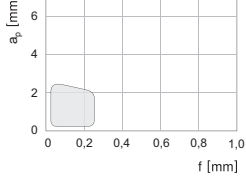




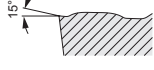
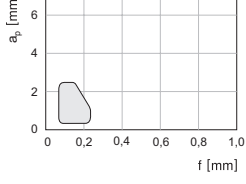



<p>NR4E</p> 	 	 HC-P15	 HC-P15	 HC-P15
<p>NR4</p> 	 	 HC-P25/M20 HC-P35/M25	 HC-P25/M20	 HC-P35/M25
<p>NR5E</p> 	 	 HC-P25	 HC-P25	 HC-P25
<p>NR5</p> 	 	 HC-P25/M20 HC-P15/M15	 HC-P25/M20	 HC-P15/M15

NL **Positieve wisselplaten voor draaien**
 FR **Plaquettes positives pour tournage**
 ES **Plaquetas positivas para torneado**
 DE **Positive Wendepplatten zum drehen**

NL **Fijn/nadraaien**
 FR **Tournage fin**
 ES **Torneado fino**
 DE **Schlichten**

P

F

<p>PF2</p> 	 			
<p>PF3</p> 	 			
<p>PF4</p> 	 			
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>CM10</p>	<p>CM10</p>	<p>CM10</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P25/M20</p>	<p>HC-P35/M25</p>	<p>HC-P35/M25</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>
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		<p>HC-P35/M30</p>	<p>HC-P35/M30</p>	<p>HC-P35/M30</p>




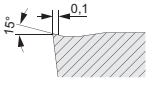
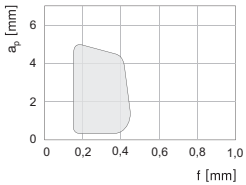




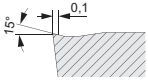
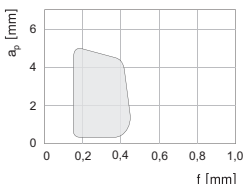





NL **Positieve wisselplaten voor draaien**
 FR **Plaquettes positives pour tournage**
 ES **Plaquetas positivas para torneado**
 DE **Positive Wendepplatten zum drehen**

NL **Middelmatige bewerking**
 FR **Tournage semi-finition**
 ES **Torneado medio**
 DE **Mittlere Zerspantung**

P

M


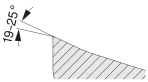
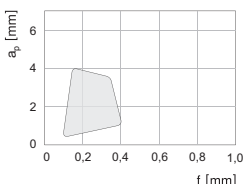



<p>PM3E</p> 	 			
		HC-P15 HC-P25/M20/S15	HC-P25/M20/S15	
<p>PM3</p> 	 			
		HC-P25/M20	HC-P25/M20 HC-P35/M25	HC-P35/M25

NL **Positieve wisselplaten voor draaien**
 FR **Plaquettes positives pour tournage**
 ES **Plaquetas positivas para torneado**
 DE **Positive Wendepplatten zum drehen**

NL **Aluminium/Non-Ferro**
 FR **Aluminium/Non-Ferro**
 ES **Aluminio/Non-Ferro**
 DE **Aluminium/Nichteisenmetall**

P

A

<p>PA2</p> 	 			
		HC-K10 K10	HC-K10	

NL **Draadsnijden**
 FR **Filetage**
 ES **Roscar**
 DE **Gewindedrehen**

<table border="1"> <thead> <tr> <th>mm</th> <th>Inch</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>09</td> <td>7/32</td> <td>5,56</td> </tr> <tr> <td>11</td> <td>1/4</td> <td>6,35</td> </tr> <tr> <td>16</td> <td>3/8</td> <td>9,52</td> </tr> <tr> <td>22</td> <td>1/2</td> <td>12,7</td> </tr> <tr> <td>27</td> <td>5/8</td> <td>15,8</td> </tr> </tbody> </table> <p>Insert size</p>	mm	Inch	mm	09	7/32	5,56	11	1/4	6,35	16	3/8	9,52	22	1/2	12,7	27	5/8	15,8	<table border="1"> <tr> <td>E</td> <td>External</td> </tr> <tr> <td>I</td> <td>Internal</td> </tr> <tr> <td>EI</td> <td>Ex- & Internal</td> </tr> </table> <p>Type of Insert</p>	E	External	I	Internal	EI	Ex- & Internal	<table border="1"> <tr> <td>R</td> <td>Right Hand</td> </tr> <tr> <td>L</td> <td>Left Hand</td> </tr> </table> <p>RH/LH Insert</p>	R	Right Hand	L	Left Hand	<table border="1"> <thead> <tr> <th colspan="2">Full Profile - Pitch Range</th> </tr> <tr> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td>0.35-25.0</td> <td>72-1</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Partial Profile - Pitch Range</th> </tr> <tr> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td>A 0.5-1.5</td> <td>48-16</td> </tr> <tr> <td>AG 0.5-3.0</td> <td>48-8</td> </tr> <tr> <td>G 1.75-3.0</td> <td>14-8</td> </tr> <tr> <td>N 3.5-5.0</td> <td>7-5</td> </tr> </tbody> </table> <p>Pitch</p>	Full Profile - Pitch Range		mm	tpi	0.35-25.0	72-1	Partial Profile - Pitch Range		mm	tpi	A 0.5-1.5	48-16	AG 0.5-3.0	48-8	G 1.75-3.0	14-8	N 3.5-5.0	7-5	<table border="1"> <thead> <tr> <th colspan="2">Partial Profile</th> </tr> </thead> <tbody> <tr> <td>60°</td> <td>60° Partial profile</td> </tr> <tr> <td>55°</td> <td>55° Partial profile</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Full Profile</th> </tr> </thead> <tbody> <tr> <td>ISO</td> <td>ISO Metric</td> </tr> <tr> <td>UN</td> <td>American UN</td> </tr> <tr> <td>W</td> <td>Whitworth BSW/BSP</td> </tr> <tr> <td>TR</td> <td>Trapez</td> </tr> </tbody> </table> <p>Thread Standard</p>	Partial Profile		60°	60° Partial profile	55°	55° Partial profile	Full Profile		ISO	ISO Metric	UN	American UN	W	Whitworth BSW/BSP	TR	Trapez	<table border="1"> <tr> <td>B</td> <td>With chipbreaker</td> </tr> <tr> <td>-</td> <td>Without</td> </tr> </table> <p>Chipbreaker</p>	B	With chipbreaker	-	Without
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16

E

R

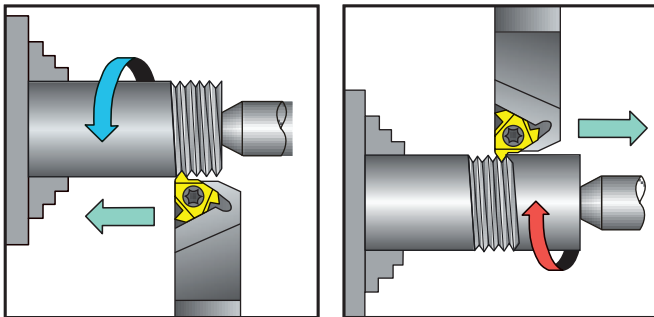
175

ISO

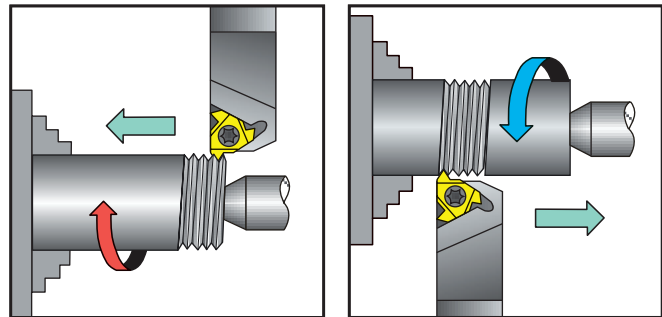
B

NL **Schroefdraadsnij methodes**
 FR **Méthodes de filetage en tournage**
 ES **Métodos de torneado de roscas**
 DE **Gewindedrehverfahren**

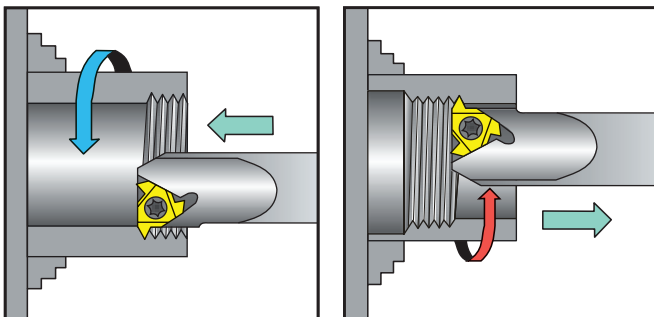
External RH Thread



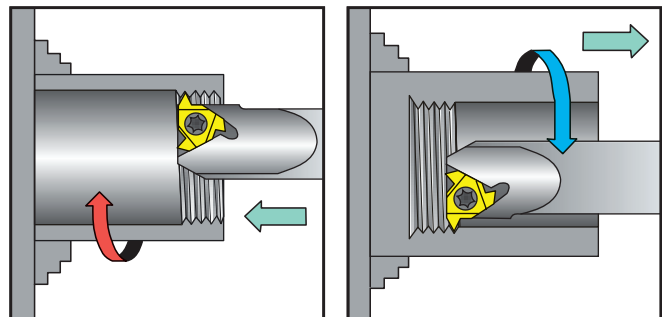
External LH Thread



Internal RH Thread

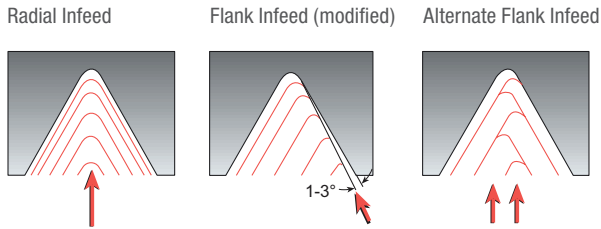


Internal LH Thread

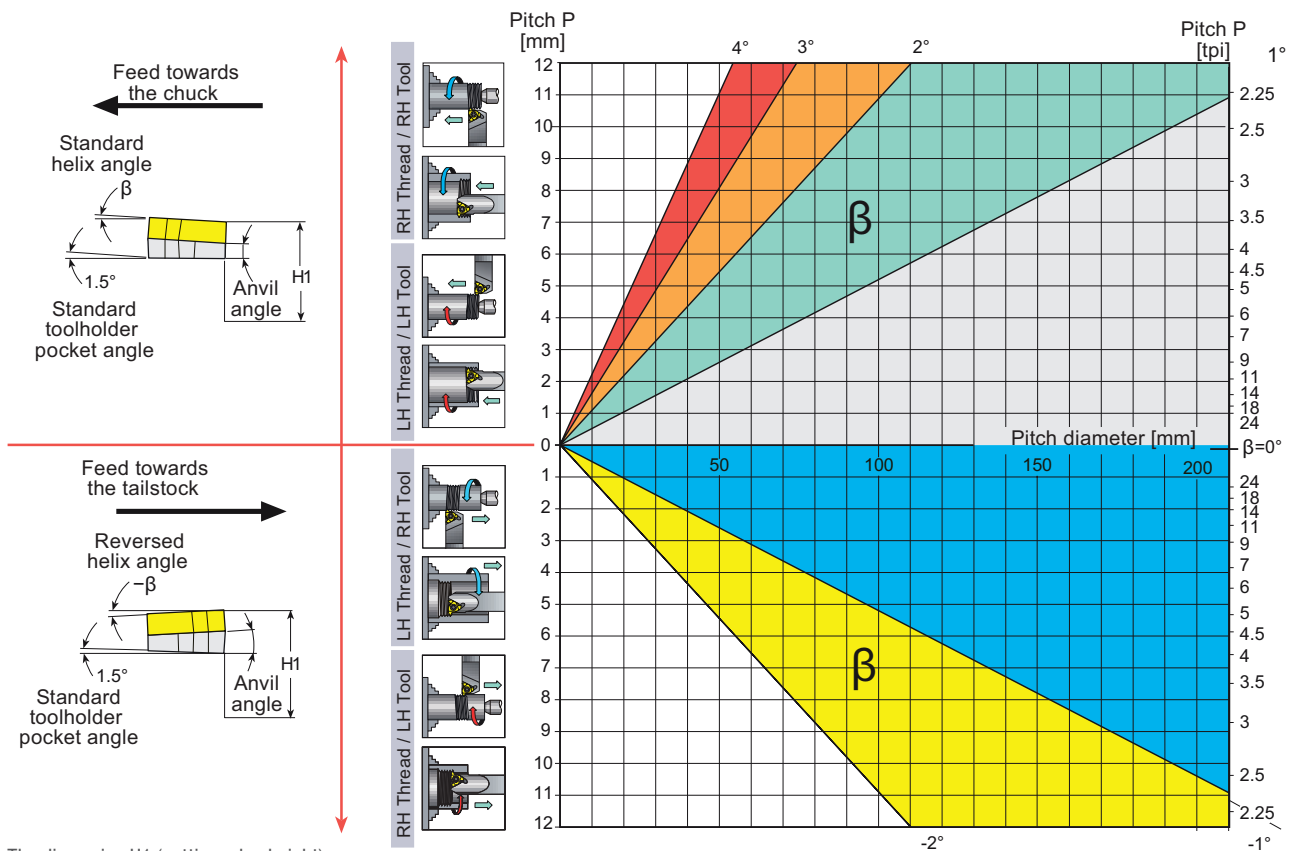




NL Invoer methoden
 FR Méthode angle d'attaque
 ES Métodos de ataque de la rosca
 DE Gewindestellverfahren



NL Schroefdraadhelingshoek diagram
 FR Diagramme de l'angle d'hélice
 ES Diagrama del ángulo de hélice
 DE Teilungswinkel Diagramm

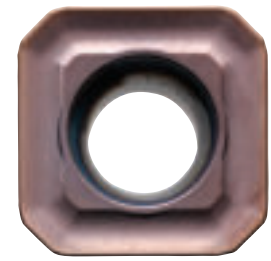


The dimension H1 (cutting edge height) remains constant with every insert / anvil combination.

NL Onderlegplaten
 FR Sous-plaquettes
 ES Placa base
 DE Unterlegplatten

Resultant Helix Angle		β Holder	3.5°	2.5°	1.5°	0.5°	0°	-0.5°	-1.5°
Insert Size	L mm		Ordering Code						
3/8"	16	ER / IL	743980170	743980175	Standard	74398180	-	743980190	743980195
		EL / IR	743980265	743980270	743980260	743980275	-	743980280	743980285
1/2"	22	ER / IL	743980205	743980210	743980200	743980215	-	743980220	743980225
		EL / IR	743980295	743980300	743980290	743980305	-	743980310	743980315
3/8" Groove	16	ER / IL	-	-	-	-	743980400	-	-
		EL / IR	-	-	-	-	743980500	-	-

NL ISO Wisselplatten
 FR Plaquettes ISO
 ES Plaquitas ISO
 DE ISO Wendepplatten



<p>A 85° B 82° K 55°</p> <p>H 120°</p> <p>L 90°</p> <p>O 135°</p> <p>P 108°</p> <p>C 80° D 55° E 75° M 86° V 35°</p> <p>R -</p> <p>S 90°</p> <p>T 60°</p> <p>W 80°</p> <p>X Special shapes</p> <p>Insert shape</p>	<p>Clearance angle</p> <p>α</p> <p>A 3° B 5° C 7° D 15° E 20° F 25° G 30° N 0° P 11° O Special version</p>	<p>Tolerances</p> <table border="1"> <tr> <td>d (±mm)</td> <td>m (±mm)</td> <td>s (±mm)</td> <td>U=6,35/9,52</td> <td>U=12,7</td> <td>U=15,8/19,05</td> </tr> <tr> <td>A .025 .005 .025</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>C .025 .013 .025</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>E .025 .025 .025</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>F .013 .005 .025</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>G .025 .025 .13</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>H .013 .013 .025</td> <td>●</td> <td>●</td> <td>●</td> 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<td>06</td> <td>04</td> </tr> <tr> <td>9.57</td> <td>15</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>10.00</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>10</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.00</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>12</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.70</td> <td>22</td> <td>12</td> <td>07</td> <td>20</td> <td>08</td> <td>05</td> <td>10</td> <td>06</td> </tr> <tr> <td>15.87</td> <td>27</td> <td>15</td> <td>09</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>16.00</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>16</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>16.74</td> <td>-</td> <td>16</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>19.05</td> <td>33</td> <td>19</td> <td>11</td> <td>-</td> <td>-</td> <td>-</td> <td>13</td> <td>07</td> </tr> <tr> <td>20.00</td> <td>-</td> 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<td>7.94</td> </tr> <tr> <td></td> <td>O9</td> <td>9.52</td> </tr> </table>	s (mm)	01	1.59		T1	1.98		O2	2.38		O3	3.18		T3	3.97		O4	4.76		O5	5.56		O6	6.35		O7	7.94		O9	9.52	<p>Facet corner radius</p> <table border="1"> <tr> <td>1st sign k_c</td> <td>2nd sign α'</td> </tr> <tr> <td>A 45°</td> <td>A 3°</td> </tr> <tr> <td>D 60°</td> <td>B 5°</td> </tr> <tr> <td>E 75°</td> <td>C 7°</td> </tr> <tr> <td>F 85°</td> <td>D 15°</td> </tr> <tr> <td>P 90°</td> <td>E 20°</td> </tr> <tr> <td>Z Others</td> <td>F 25°</td> </tr> <tr> <td></td> <td>G 30°</td> </tr> <tr> <td></td> <td>N 0°</td> </tr> <tr> <td></td> <td>P 11°</td> </tr> <tr> <td></td> <td>Z Others</td> </tr> </table> <p>Radius r (mm)</p> <table border="1"> <tr> <td>M0*</td> <td>02</td> <td>0.2</td> </tr> <tr> <td></td> <td>04</td> <td>0.4</td> </tr> <tr> <td></td> <td>08</td> <td>0.8</td> </tr> <tr> <td></td> <td>12</td> <td>1.2</td> </tr> </table> <p>* Shape R only</p>	1st sign k _c	2nd sign α'	A 45°	A 3°	D 60°	B 5°	E 75°	C 7°	F 85°	D 15°	P 90°	E 20°	Z Others	F 25°		G 30°		N 0°		P 11°		Z Others	M0*	02	0.2		04	0.4		08	0.8		12	1.2	<p>Cutting edge</p> <p>F Sharp E Honed S Chamfered and honed T Chamfered</p>	<p>Cutting direction</p> <p>R L N</p>
d (±mm)	m (±mm)	s (±mm)	U=6,35/9,52	U=12,7	U=15,8/19,05																																																																																																																																																																																																																																																																																																																																																																						
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S E H T 12 03 AE SN

<p>ALU Uncoated</p> <p>HC Coated</p> <p>Surface</p>	<p>P ■ Steel</p> <p>M ■ INOX</p> <p>K ■ Cast ■ NF</p> <p>S ■ Super Alloys</p> <p>ISO Index</p>	<p>10 ↑ Hard</p> <p>↕</p> <p>35 ↓ Tough</p> <p>Carbide Grade</p>
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HC P 25





NL Slijtage soorten
 FR Types d'usure
 ES Tipos de desgaste
 DE Verschleißarten

	<p>Built-up edge (Adhesive wear)</p>	
	<p>Notching (Adhesive/Mechanic)</p>	
	<p>Crater (Chemical wear)</p>	
	<p>Flank wear (Abrasive wear)</p>	
	<p>Plastic deformation (Thermal wear)</p>	
	<p>Thermal cracks (Thermal wear)</p>	
	<p>Breakage (Mechanic wear)</p>	

NL **Maatregelen bij draaiproblemen**
 FR **Problèmes de tournage et solutions**
 ES **Problemas de torneado y soluciones**
 DE **Maßnahmen bei Drehproblemen**

Type of problem													
Build up edge	Notching	Cratering	Flank wear	Plastic deformation	Breakage	Edge chipping	Surface quality	Vibration	Formation of burrs and pips	Long chips (tangled swarf)	Short chips (fragmented chips)	Corrective measures	
↑	↓	↓	↓	↓			↑	↓				Cutting speed	
			■							↑	↓	Feed rate	
		↓				↓			↓			Feed - center area	
↓		↓	■	■		↑		■	↓	↓		Chip groove ↓ R M ↑ F	
			↑	↑		↑			↓			Corner radius Larger ↓ ↑ smaller	
		↑	↑	↑	↓	↓						Cutting material wear resistance ↓ ↑ toughness	
			■	■	■	■	■					Clamping of tool	
			■	■	■	■	■					Clamping of workpiece	
□			□	□			□		□	□		Coolant	

↑ Raise, increase ↓ Avoid, reduce ■ Check, optimize □ Use





NL **Maatregelen bij freesproblemen**
 FR **Problèmes de fraisage et solutions**
 ES **Problemas de fresado y soluciones**
 DE **Maßnahmen bei Fräsproblemen**

Type of problem											Corrective measures
Build up edge	Notching	Cratering	Flank wear	Plastic deformation	Thermal cracks	Breakage	Edge chipping	Bad workpiece surface	Chattering vibration	Edge chipping on the workpiece	
↑	↓	↓	↓	↓	↓		↑	↑	■		Cutting speed
↑	↓	↓	↑	↓	↓	↓	↓	↓	■		Feed rate per tooth
	↑				■	↑	↑				Toughness of cutting material
		↑	↑	↑							Wear resistance of cutting material
■	↓				↓				↓	↓	Approach angle
↑	■			↑		■	■		↑		Rake angle
■	↑						↑	↓		↓	Cutting edge facet
						↑	↑	↑			Stability
								↑	↑		Precision of axial & radial run-out
			■	■		■	■			■	Wear of cutting edge
↑	↑	↑		■	↑			■			Cooling, chipremoval
	■					■	■	■	■	↓	Dept of cut

↑ Raise, increase

↓ Lower, decrease

■ Check, optimize