



CARBIDE CUTTING TOOLS

GENERAL CATALOG

2018



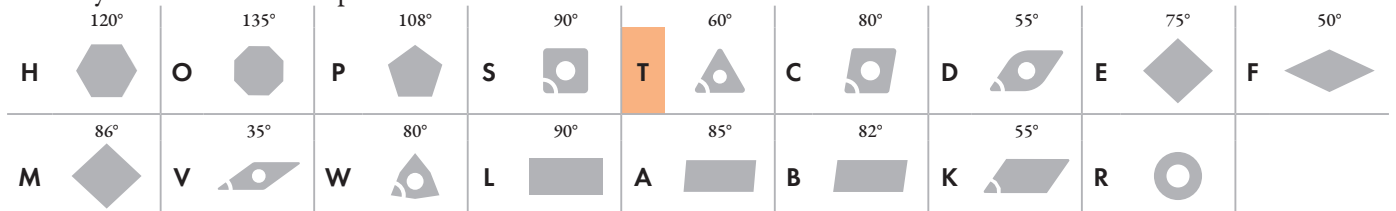
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Turning inserts

1. **T** 2. **N** 3. **M** 4. **G** 5. **16** 6. **03** 7. **08** 7b. **AN** 8. **E** 9. **N** 10. **ST**

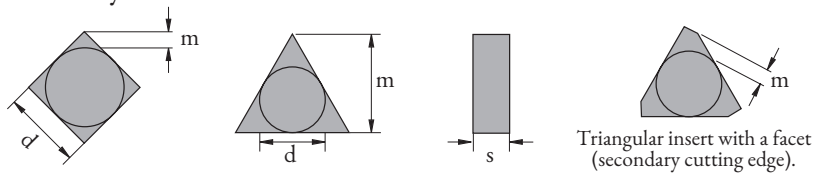
1. **T**— Symbol for insert shape



2. **N**— Symbol for normal clearance



3. **M**— Symbol for tolerances



Symbol (mm)	A	F	C	H	E	G	J	K*	L*	M*	N*	U*
m	±0.005	±0.005	±0.013	±0.013	±0.025	±0.025	±0.005	±0.013	±0.025	±0.08~±0.20	±0.08~±0.20	±0.13~±0.38
d	±0.025	±0.013	±0.025	±0.013	±0.025	±0.025	±0.05~±0.13	±0.05~±0.13	±0.05~±0.13	±0.05~±0.13	±0.05~±0.13	±0.08~±0.25
s	±0.025	±0.025	±0.025	±0.025	±0.025	±0.013	±0.025	±0.025	±0.025	±0.013	±0.025	±0.013

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size, for the accuracy of Class M, refer to the table on the right.

Inscribed circle	T ▲	S ■	C ▱	D ▱	V ▱
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.08	±0.11	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle	T ▲	S ■	C ▱	D ▱	V ▱	R ●
6.35	±0.05	-	-	-	-	-
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	-	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	-	±0.10
19.05	-	-	-	-	-	±0.10
25.40	-	±0.13	-	-	-	±0.10
31.75	-	±0.20	-	-	-	±0.12

4. **G**— Type of chip breaker and/or clamping (Metrical)

Symbol	Type	Type of hole	Chip-breaker	Shape	Symbol	Type	Type of hole	Chip-breaker	Shape	Symbol	Type	Type of hole	Chip-breaker	Shape
W	With hole	Round hole / one countersink (40°~60°)	Without chipbreaker		H	With Hole	Round hole / double countersink (70°~90°)	Chip-breaker on one side		G	With Hole	Round hole	Chipbreaker on both sides	
T	With hole	Round hole / one countersink (40°~60°)	Chipbreaker on one side		C	With Hole	Round hole / double countersink (70°~90°)	Without chipbreaker		N	With Hole	-	Without chipbreaker	
Q	With hole	Round hole / double countersink (40°~60°)	Without chipbreaker		J	With Hole	Round hole / double countersink (70°~90°)	Chip-breaker on one side		R	Without Hole	-	Chipbreaker on one side	
U	With hole	Round hole / double countersink (40°~60°)	Chipbreaker on both sides		A	With Hole	Round hole	Without chipbreaker		F	Without Hole	-	Chipbreaker on both sides	
B	With hole	Round hole / double countersink (70°~90°)	Without chipbreaker		M	With Hole	Round hole	Chip-breaker on one side		X	-	-	-	On request

5. 16 — Symbol for insert size

								Ø IC		ANSI Symbol
	R's	V's	D's	C's	S's	T's	W's	mm	inch	
–	06	04	–	03	06	02	–	3,97	5/32	1,20
–	08	05	04	04	04	08	L3	4,76	3/16	1,50
–	09	06	05	05	05	09	03	5,56	7/32	1,80
06**	–	–	–	–	–	–	–	6,00	0,236	–
06*	11	07	06	06	06	11	04	6,35	1/4	2,00
07*	13	09	08	07	07	13	05	7,94	5/16	2,50
08*	–	–	–	–	–	–	–	8,00	0,315	–
09*	16	11	09	09	09	16	06	9,525	3/8	3,00
10**	–	–	–	–	–	–	–	10,00	0,394	–
12**	–	–	–	–	–	–	–	12,00	0,472	–
12*	22	15	12	12	12	22	08	12,70	1/2	4,00
15*	27	19	16	15	15	27	10	15,875	5/8	5,00
16**	–	–	–	–	–	–	–	16,00	0,63	–
19*	33	23	19	19	19	33	13	19,05	3/4	6,00
20**	–	–	–	–	–	–	–	20,00	0,787	–
25**	–	–	–	–	–	–	–	25,00	0,984	–
25*	44	31	25	25	25	44	17	25,40	1,00	8,00
31*	54	38	32	31	31	54	21	31,75	1 1/4	10,00
32**	–	–	–	–	–	–	–	32,00	1,26	–

*ANSI designation only (Radius Designation is 00)
According to International Standard ISO 1832-2012 (E)

**Metric designation only (Radius Designation is M0)
"Indexable inserts for cutting tools – Designation"

6. 03 — Symbol for insert thickness

ISO	01	T1	02	03	T3	04	05	06	07	09	12
mm	1.59	1.98	2.38	3.18	3.97	4.76	5.56	6.35	7.94	9.52	12.70
ANSI	1	1.2	1.5	2	2.5	3	3.5	4	5	6	6
inch	0.062	0.078	0.094	0.125	0.156	0.188	0.219	0.250	0.312	0.375	0.500

7. 08 — Symbol for insert corner configuration

ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/metric)	Round insert		0

7b. AN — Symbol for insert with secondary edges

For inserts having secondary edges two digits are user:

1st Digit is secondary edge	2nd Digit is secondary relief angle	
A	45°	
D	60°	
E	75°	
F	85°	
P	90°	
Z	special	
	N	0°
	P	11°
	Z	special

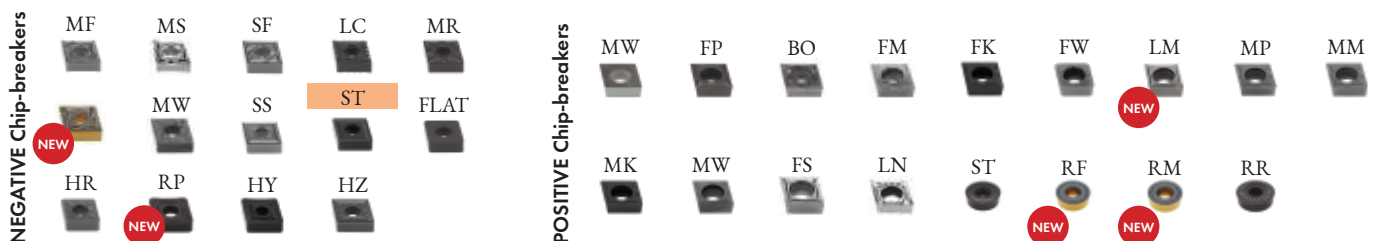
8. E — Cutting edge condition

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfred no honing	T
	Chamfred with honing	S






9. N — Cutting edge condition

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

10. ST — Chipbreaker geometries



CN – rhombic 80° negative





Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S												
				FTR20	GO15	GO25	FO15	FO25	TC20P	SVN10	SVN20	FO15	FO25	TC35M	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20							
 Roughing	CNMA 090304	1,50 (0,15–3,00)	0,15 (0,10–0,20)																										
	CNMA 090308	1,50 (0,15–3,00)	0,25 (0,10–0,30)																										
	CNMA 120404	2,50 (0,20–5,00)	0,20 (0,10–0,30)																										
	CNMA 120408	4,00 (0,20–8,00)	0,35 (0,15–0,60)																										
	CNMA 120412	4,00 (0,30–8,00)	0,45 (0,20–0,80)																										
	CNMA 120416	4,00 (0,30–8,00)	0,55 (0,20–1,00)																										
	CNMA 160608	5,00 (0,30–10,00)	0,45 (0,20–0,80)																										
	CNMA 160612	5,00 (0,30–10,00)	0,45 (0,20–0,80)																										
	CNMA 160616	5,00 (0,30–10,00)	0,55 (0,20–1,00)																										
	CNMA 190612	6,00 (0,30–12,00)	0,45 (0,20–0,80)																										
	CNMA 190616	6,00 (0,30–12,00)	0,55 (0,20–1,00)																										
	CNMA 190624	6,00 (0,40–12,00)	0,60 (0,20–1,40)																										
 Finishing	CNMG 090304-MF	0,35 (0,10–1,50)	0,15 (0,05–0,25)																										
	CNMG 090308-MF	0,35 (0,10–1,50)	0,20 (0,10–0,40)																										
	CNMG 09T304-MF	0,35 (0,10–1,50)	0,15 (0,05–0,25)																										
	CNMG 09T308-MF	0,35 (0,10–1,50)	0,20 (0,10–0,40)																										
	CNMG 120404-MF	0,40 (0,10–1,50)	0,15 (0,05–0,25)																										
	CNMG 120408-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)																										
 Medium to Finishing	CNMG 120404-MS	1,50 (0,20–3,60)	0,15 (0,10–0,20)																										
	CNMG 120408-MS	2,00 (0,30–3,60)	0,25 (0,10–0,40)																										
	CNMG 120412-MS	2,40 (0,40–3,60)	0,30 (0,15–0,60)																										
	CNMG 120416-MS	2,40 (0,40–3,60)	0,40 (0,15–0,8a0)																										
 Medium to Finishing	CNMG 120404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)																										
	CNMG 120408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)																										
	CNMG 120412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)																										
 Medium	CNMG 120404-EMM	1,00 (0,40–2,50)	0,10 (0,07–0,30)																										
	CNMG 120408-EMM	1,50 (0,40–2,50)	0,15 (0,10–0,40)																										
	CNMG 120412-EMM	1,50 (0,40–2,50)	0,20 (0,15–0,40)																										

◊ First choice

◊ Stock Items

○ Available under request

CN – rhombic 80° negative






Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S					
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20
CNMG-MR  Medium	CNMG 090304-MR	2,00 (0,40–4,00)	0,20 (0,10–0,30)				⦿	⦿	○													
	CNMG 090308-MR	2,00 (0,50–4,00)	0,30 (0,15–0,50)				⦿	⦿	○													
	CNMG 090408-MR	2,00 (0,50–4,00)	0,30 (0,15–0,50)				○	○	○													
	CNMG 120404-MR	3,00 (0,40–5,50)	0,20 (0,10–0,30)	⦿			⦿	⦿	⦿													
	CNMG 120408-MR	3,00 (0,50–5,50)	0,30 (0,15–0,50)	⦿			⦿	⦿	⦿													
	CNMG 120412-MR	3,00 (0,80–5,50)	0,35 (0,18–0,60)	⦿			⦿	⦿	⦿													
	CNMG 120416-MR	3,00 (1,00–5,50)	0,40 (0,23–0,65)				⦿	⦿	⦿													
	CNMG 160608-MR	4,00 (0,50–7,20)	0,30 (0,15–0,50)	⦿			⦿	⦿	⦿													
	CNMG 160612-MR	4,00 (0,80–7,20)	0,35 (0,18–0,60)	⦿			⦿	⦿	⦿													
	CNMG 160616-MR	4,00 (1,00–7,20)	0,40 (0,23–0,65)				⦿	⦿	⦿													
	CNMG 190612-MR	4,00 (0,80–8,60)	0,35 (0,18–0,60)	⦿			⦿	⦿	⦿													
	CNMG 190616-MR	4,00 (1,00–8,60)	0,40 (0,23–0,65)				⦿	⦿	⦿													
CNMG-PM  Medium	CNMG 120404-PM	3,00 (0,40–5,50)	0,20 (0,10–,30)		⦿	⦿																
	CNMG 120408-PM	3,00 (0,50–5,50)	0,30 (0,15–0,50)		⦿	⦿																
	CNMG 120412-PM	3,00 (0,80–5,50)	0,35 (0,18–0,60)		⦿	⦿																
	CNMG 120416-PM	3,00 (1,00–5,50)	0,40 (0,23–0,65)		⦿	⦿																
CNMG-MW  Medium Wiper	CNMG 120408-MW	3,00 (0,50–5,00)	0,30 (0,15–0,60)	⦿			⦿	⦿	⦿	⦿	⦿	⦿		○	⦿							
	CNMG 120412-MW	3,50 (0,80–6,00)	0,50 (0,20–0,90)	⦿			⦿	⦿	⦿	⦿	⦿	⦿		○	⦿							
CNMG-SS  Roughing to Medium	CNMG 090304-SS	2,00 (0,50–2,50)	0,20 (0,10–0,25)							⦿	⦿	⦿							⦿	⦿		
	CNMG 090308-SS	2,00 (0,50–2,50)	0,25 (0,12–0,45)							⦿	⦿	⦿	⦿						⦿	⦿		
	CNMG 120404-SS	3,00 (0,50–5,70)	0,20 (0,10–0,25)							⦿	⦿	⦿	⦿	⦿					⦿	⦿		
	CNMG 120408-SS	3,00 (0,50–5,70)	0,25 (0,12–0,45)							⦿	⦿	⦿	⦿	⦿	⦿				⦿	⦿		
	CNMG 120412-SS	3,00 (0,50–5,70)	0,30 (0,15–0,60)							⦿	⦿	⦿	⦿	⦿					⦿	⦿		
	CNMG 120416-SS	3,00 (0,50–5,70)	0,37 (0,18–0,65)							⦿		○	⦿						○	⦿		
	CNMG 160608-SS	4,00 (0,50–7,20)	0,25 (0,12–0,45)							⦿		○	⦿						○	⦿		
	CNMG 160612-SS	4,00 (0,50–7,20)	0,30 (0,15–0,60)							⦿		○	⦿						○	⦿		
	CNMG 190612-SS	4,00 (0,50–8,50)	0,30 (0,15–0,60)							⦿		○	⦿						○	⦿		
CNMG 190616-SS	4,00 (0,50–8,50)	0,37 (0,18–0,65)							⦿		○	⦿						○	⦿			

⦿ First choice

⦿ Stock Items






○ Available under request

CN – rhombic 80° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P							M					K		N		S		
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20
 Medium	CNMG 090304-ST	2,00 (0,15–4,00)	0,22 (0,15–0,26)																			
	CNMG 090308-ST	2,00 (0,15–4,00)	0,35 (0,15–0,50)																			
	CNMG 120404-ST	2,50 (0,20–5,00)	0,22 (0,15–0,26)															⊕	⊕			
	CNMG 120408-ST	3,00 (0,20–6,00)	0,35 (0,15–0,50)															⊕	⊕			
	CNMG 120412-ST	0,30 (0,30–6,00)	0,40 (0,15–0,60)															⊕	⊕			
	CNMG 120416-ST	0,30 (0,30–6,00)	0,45 (0,20–0,70)															⊕	⊕			
	CNMG 160608-ST	4,00 (0,20–8,00)	0,35 (0,15–0,50)															⊕	⊕			
	CNMG 160612-ST	4,00 (0,30–8,00)	0,40 (0,15–0,60)															⊕	⊕			
	CNMG 160616-ST	4,00 (0,30–8,00)	0,45 (0,20–0,70)															⊕	⊕			
	CNMG 190612-ST	4,50 (0,30–9,00)	0,40 (0,15–0,60)															⊕	⊕			
CNMG 190616-ST	4,50 (0,30–9,00)	0,45 (0,20–0,70)															⊕	⊕				
 Roughing	CNMG 120408-HR	4,00 (1,00–7,00)	0,35 (0,20–0,55)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 120412-HR	4,00 (1,00–7,00)	0,40 (0,25–0,60)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 120416-HR	4,00 (1,50–7,00)	0,50 (0,32–0,75)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 160608-HR	5,00 (1,00–8,00)	0,35 (0,25–0,55)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 160612-HR	5,00 (1,00–8,00)	0,40 (0,32–0,60)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 160616-HR	5,00 (1,50–8,00)	0,50 (0,40–0,75)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 190612-HR	5,50 (2,00–10,00)	0,40 (0,25–0,70)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
	CNMG 190616-HR	5,50 (2,00–10,00)	0,50 (0,32–0,80)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		⊕	⊕	⊕			
CNMG 250924-HR	6,00 (2,00–15,00)	0,60 (0,40–1,00)						⊕	⊕			○	⊕	⊕			○	⊕				
 Roughing	CNMM 190612-RP	5,50 (2,00–10,00)	0,40 (0,25–0,70)	○			⊕	⊕				⊕	⊕				○					
	CNMM 190616-RP	5,50 (2,00–10,00)	0,50 (0,32–0,80)	○			⊕	⊕				⊕	⊕				○					
	CNMM 190624-RP	6,00 (2,00–12,00)	0,60 (0,35–1,20)	○			⊕	⊕				⊕	⊕				○					
 Heavy to Roughing	CNMM 190612-HY	6,00 (2,00–12,00)	0,50 (0,35–0,80)				⊕	⊕	⊕				⊕	⊕	⊕							
	CNMM 190616-HY	6,00 (2,00–12,00)	0,60 (0,35–1,00)				⊕	⊕	⊕				⊕	⊕	⊕							
	CNMM 190624-HY	6,00 (2,00–12,00)	0,60 (0,35–1,20)				⊕	⊕	⊕				⊕	⊕	⊕							
	CNMM 250924-HY	8,00 (2,50–15,00)	0,70 (0,40–1,40)				⊕	⊕	⊕				⊕	⊕	⊕							
 Heavy to Roughing	CNMM 190612-HZ	10,00 (2,40–12,00)	0,65 (0,50–0,80)	⊕			⊕	⊕	⊕									⊕	⊕			
	CNMM 190616-HZ	10,00 (2,40–12,00)	0,80 (0,50–1,10)	⊕			⊕	⊕	⊕										⊕	⊕		
	CNMM 190624-HZ	10,00 (3,20–12,00)	1,00 (0,60–1,60)				⊕	⊕	⊕										⊕	⊕		
	CNMM 250924-HZ	10,00 (3,20–17,00)	1,00 (0,60–1,60)				⊕	⊕	⊕										⊕	⊕		






- ⊕ First choice
- ⊖ Stock Items
- Available under request

DN – rhombic 55° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P								M					K	N	S							
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20				
DNMA  Roughing	DNMA 110404	2,00 (0,20–3,50)	0,15 (0,10–0,30)																			⊕	⊕			
	DNMA 150404	3,00 (0,20–4,00)	0,15 (0,10–0,30)																				⊕	⊕		
	DNMA 150408	3,00 (0,20–6,00)	0,35 (0,15–0,60)																				⊕	⊕		
	DNMA 150412	3,00 (0,30–6,00)	0,45 (0,20–0,80)																				⊕	⊕		
	DNMA 150416	3,00 (0,30–6,00)	0,55 (0,20–1,00)																				⊕	⊕		
	DNMA 150604	3,00 (0,20–4,00)	0,15 (0,10–0,30)																				⊕	⊕		
	DNMA 150608	3,00 (0,20–6,00)	0,35 (0,15–0,60)																				⊕	⊕		
	DNMA 150612	3,00 (0,30–6,00)	0,45 (0,20–0,80)																				⊕	⊕		
	DNMA 150616	3,00 (0,30–6,00)	0,55 (0,20–1,00)																				⊕	⊕		
DNMG-MF  Finishing	DNMG 110404-MF	0,40 (0,10–1,50)	0,15 (0,05–0,25)				⊕	⊕			⊕	⊕														
	DNMG 110408-MF	0,40 (0,10–1,50)	0,20 (0,15–0,40)				⊕	⊕			⊕	⊕														
	DNMG 150404-MF	0,40 (0,10–1,50)	0,15 (0,05–0,25)				⊕	⊕	○	⊕	⊕	⊕	○	⊕												
	DNMG 150408-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)				⊕	⊕	○	⊕	⊕	⊕	○	⊕												
	DNMG 150412-MF	0,80 (0,20–2,50)	0,25 (0,15–0,50)				⊕	⊕	○	○	⊕	⊕	○	○												
	DNMG 150604-MF	0,40 (0,10–1,50)	0,15 (0,05–0,25)				⊕	⊕		⊕	⊕		⊕													
	DNMG 150608-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)				⊕	⊕		⊕	⊕		⊕													
	DNMG 150612-MF	0,80 (0,20–2,50)	0,25 (0,15–0,50)				⊕	⊕		○	⊕	⊕		○												
DNMG-MS  Medium to Finishing	DNMG 150404-MS	1,50 (0,20–3,60)	0,15 (0,10–0,20)											⊕							⊕	⊕				
	DNMG 150408-MS	2,00 (0,30–3,80)	0,25 (0,10–0,40)											⊕								⊕	⊕			
	DNMG 150412-MS	2,50 (0,40–4,00)	0,30 (0,15–0,60)											⊕								⊕	⊕			
	DNMG 150416-MS	2,80 (0,40–4,50)	0,40 (0,15–0,80)											⊕								○	⊕			
	DNMG 150604-MS	1,50 (0,20–3,60)	0,15 (0,10–0,20)											⊕								⊕	⊕			
	DNMG 150608-MS	2,00 (0,30–4,00)	0,25 (0,10–0,40)											⊕								⊕	⊕			
	DNMG 150612-MS	2,80 (0,40–4,50)	0,30 (0,15–0,60)											⊕								○	⊕			
DNMG-SF  Medium to Finishing	DNMG 110404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)											⊕	⊕							⊕	⊕			
	DNMG 110408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)											⊕	⊕								⊕	⊕		
	DNMG 150404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)											⊕	⊕								⊕	⊕		
	DNMG 150408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)											⊕	⊕									⊕	⊕	
	DNMG 150412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)											⊕	⊕									⊕	⊕	
	DNMG 150604-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)											⊕	⊕									⊕	⊕	
	DNMG 150608-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)											⊕	⊕										⊕	⊕
	DNMG 150612-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)											⊕	⊕										⊕	⊕
DNMG-LC  Medium to Finishing	DNMG 150404-LC	1,00 (0,40–2,50)	0,15 (0,07–0,30)				⊕	⊕																		
	DNMG 150408-LC	1,50 (0,40–2,50)	0,20 (0,10–0,40)				⊕	⊕																		
	DNMG 150412-LC	2,00 (0,80–3,00)	0,25 (0,15–0,50)				⊕	⊕																		
	DNMG 150604-LC	2,00 (0,40–3,00)	0,15 (0,07–0,30)				⊕	⊕																		
	DNMG 150608-LC	2,00 (0,40–3,00)	0,20 (0,10–0,40)				⊕	⊕																		
	DNMG 150612-LC	2,50 (0,80–3,50)	0,25 (0,15–0,50)				⊕	⊕																		





⊕ First choice ⊖ Stock Items ○ Available under request

DN – rhombic 55° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P								M					K	N	S		
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10
DNMG-MR  Medium	DNMG 110404-MR	2,00 (0,40–5,00)	0,20 (0,10–0,30)				⊕	⊕	○												
	DNMG 110408-MR	2,00 (0,50–5,00)	0,30 (0,15–0,50)				⊕	⊕	○												
	DNMG 150404-MR	3,00 (0,40–6,00)	0,20 (0,10–0,30)	○			⊕	⊕	⊕												
	DNMG 150408-MR	3,00 (0,50–6,00)	0,30 (0,15–0,50)	○			⊕	⊕	⊕												
	DNMG 150412-MR	3,00 (0,80–6,00)	0,35 (0,18–0,60)	○			⊕	⊕	⊕												
	DNMG 150604-MR	3,00 (0,40–6,00)	0,20 (0,10–0,30)	○			⊕	⊕	⊕												
	DNMG 150608-MR	3,00 (0,50–6,00)	0,30 (0,15–0,50)	○			⊕	⊕	⊕												
	DNMG 150612-MR	3,00 (0,80–6,00)	0,35 (0,18–0,60)	○			⊕	⊕	⊕												
	DNMG 150616-MR	3,00 (1,00–6,00)	0,40 (0,23–0,65)				○	⊕	○												
DNMG-PM  Medium	DNMG 150404-PM	3,00 (0,40–6,00)	0,20 (0,10–0,30)		⊕	⊕															
	DNMG 150408-PM	3,00 (0,50–6,00)	0,30 (0,15–0,50)		⊕	⊕															
	DNMG 150412-PM	3,00 (0,80–6,00)	0,35 (0,18–0,60)		⊕	⊕															
	DNMG 150416-PM	3,00 (1,00–6,00)	0,40 (0,23–0,65)		⊕	⊕															
	DNMG 150604-PM	2,50 (0,50–5,00)	0,25 (0,15–0,40)		⊕	⊕															
	DNMG 150608-PM	3,00 (0,50–6,00)	0,30 (0,15–0,50)		⊕	⊕															
	DNMG 150612-PM	2,50 (0,50–7,00)	0,35 (0,20–0,60)		⊕	⊕															
DNMG-MW  Medium Wiper	DNMG 150408-MW	2,50 (0,30–4,00)	0,35 (0,15–0,60)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	DNMG 150412-MW	3,00 (0,50–5,00)	0,50 (0,25–0,90)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	DNMG 150608-MW	3,00 (0,30–4,50)	0,35 (0,15–0,60)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	DNMG 150612-MW	3,50 (0,50–5,50)	0,50 (0,25–0,90)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
DNMG-SS  Roughing to Medium	DNMG 110408-SS	2,00 (0,50–4,40)	0,25 (0,12–0,45)								○	⊕	⊕	⊕					⊕	⊕	
	DNMG 150404-SS	3,00 (0,30–6,00)	0,25 (0,10–0,30)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150408-SS	3,00 (0,50–6,40)	0,25 (0,12–0,45)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150412-SS	3,00 (0,50–6,40)	0,30 (0,15–0,60)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150604-SS	3,00 (0,30–6,00)	0,25 (0,10–0,30)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150608-SS	3,00 (0,50–6,40)	0,25 (0,12–0,45)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150612-SS	3,00 (0,50–6,40)	0,30 (0,15–0,60)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	DNMG 150616-SS	3,00 (0,50–6,40)	0,50 (0,20–1,00)								⊕		○	⊕					○	⊕	
DNMG-ST  Medium	DNMG 110404-ST	2,00 (0,20–3,50)	0,20 (0,15–0,30)													⊕	⊕				
	DNMG 110408-ST	2,00 (0,20–3,50)	0,35 (0,15–0,50)													⊕	⊕				
	DNMG 150404-ST	2,50 (0,20–5,00)	0,20 (0,15–0,30)													⊕	⊕				
	DNMG 150408-ST	2,50 (0,50–5,00)	0,35 (0,15–0,50)													⊕	⊕				
	DNMG 150412-ST	3,00 (0,50–6,00)	0,50 (0,25–0,70)													⊕	⊕				
	DNMG 150416-ST	3,00 (0,30–6,00)	0,60 (0,25–1,00)													⊕	⊕				
	DNMG 150604-ST	2,50 (0,20–5,00)	0,20 (0,15–0,30)													⊕	⊕				
	DNMG 150608-ST	2,50 (0,20–5,00)	0,35 (0,15–0,50)													⊕	⊕				
	DNMG 150612-ST	3,00 (0,30–6,00)	0,50 (0,15–0,70)													⊕	⊕				
DNMG 150616-ST	3,00 (0,30–6,00)	0,60 (0,25–1,00)													⊕	⊕					

⊕ First choice ⊕ Stock Items ○ Available under request

DN – rhombic 55° negative



Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S				
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10
 DNMG-HR Roughing	DNMG 150408-HR	4,00 (0,80–6,00)	0,35 (0,20–0,55)	⊕			⊕	⊕			⊕	⊕				⊕	⊕	⊕			
	DNMG 150412-HR	4,00 (1,00–6,00)	0,40 (0,25–0,70)	⊕			⊕	⊕			⊕	⊕				⊕	⊕	⊕			
	DNMG 150608-HR	4,00 (0,80–6,00)	0,35 (0,20–0,55)	⊕			⊕	⊕			⊕	⊕				⊕	⊕	⊕			
	DNMG 150612-HR	4,00 (1,00–6,00)	0,40 (0,25–0,70)	⊕			⊕	⊕			⊕	⊕				⊕	⊕	⊕			
	DNMG 150616-HR	4,00 (1,50–6,00)	0,50 (0,30–0,80)	⊕			⊕	⊕			⊕	⊕				⊕	⊕	⊕			
 DNMX-02 Medium to Finishing	DNMX 150604-L02	2,50 (0,70–5,00)	0,20 (0,14–0,25)				⊕	⊕			⊕	⊕									
	DNMX 150604-R02	2,50 (0,70–5,00)	0,20 (0,14–0,25)				⊕	⊕			⊕	⊕									
	DNMX 150608-L02	3,00 (0,80–5,00)	0,35 (0,14–0,50)				⊕	⊕			⊕	⊕									
	DNMX 150608-R02	3,00 (0,80–5,00)	0,35 (0,14–0,50)				⊕	⊕			⊕	⊕									
 DNMX-03 Medium	DNMX 150604-L03	2,70 (0,80–5,50)	0,20 (0,15–0,25)				⊕	⊕			⊕	⊕									
	DNMX 150604-R03	2,70 (0,80–5,50)	0,20 (0,15–0,25)				⊕	⊕			⊕	⊕									
	DNMX 150608-L03	3,20 (1,00–6,00)	0,35 (0,16–0,50)				⊕	⊕			⊕	⊕									
	DNMX 150608-R03	3,20 (1,00–6,00)	0,35 (0,16–0,50)				⊕	⊕			⊕	⊕									
 DNMX-01 Roughing to Medium	DNMX 150408-L01	2,50 (1,00–5,00)	0,35 (0,20–0,50)				⊕	⊕			⊕	⊕									
	DNMX 150408-R01	2,50 (1,00–5,00)	0,35 (0,20–0,50)				⊕	⊕			⊕	⊕									
	DNMX 150604-L01	3,00 (1,50–6,00)	0,25 (0,15–0,30)				⊕	⊕			⊕	⊕									
	DNMX 150604-R01	3,00 (1,50–6,00)	0,25 (0,15–0,30)				⊕	⊕			⊕	⊕									
	DNMX 150608-L01	3,50 (2,00–6,50)	0,35 (0,20–0,50)				⊕	⊕			⊕	⊕									
	DNMX 150608-R01	3,50 (2,00–6,50)	0,35 (0,20–0,50)				⊕	⊕			⊕	⊕									

⊕ First choice



⊖ Stock Items

○ Available under request

KN – parallelogram 55° negative




Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K		N		S					
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20		
 KNUX-01 Finishing	KNUX 160405-L01	3,00 (1,00–6,00)	0,30 (0,20–0,35)				⬢	⬢						⬢	⬢					○				
	KNUX 160405-R01	3,00 (1,00–6,00)	0,30 (0,20–0,35)				⬢	⬢						⬢	⬢						○			
 KNUX-02 Medium	KNUX 160410-L02	4,00 (1,50–6,00)	0,50 (0,40–0,70)				⬢	⬢						⬢	⬢					○				
	KNUX 160410-R02	4,00 (1,50–6,00)	0,50 (0,40–0,70)				⬢	⬢						⬢	⬢						○			

RN – round R° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K		N		S						
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20			
 RNMG-ST Medium	RNMG 090300-ST	2,30 (0,90–4,50)	0,30 (0,10–0,90)						⬢	○				⬢	○					○	○				
	RNMG 120400-ST	3,00 (1,20–4,80)	0,40 (0,12–1,20)						⬢	○				⬢	○					○	○				
	RNMG 150600-ST	3,80 (1,50–7,50)	0,50 (0,15–1,50)						⬢	○				⬢	○					○	○				
	RNMG 190600-ST	4,50 (1,90–7,60)	0,65 (0,20–1,90)				○	⬢	○					○	⬢	○				○	○	○			
	RNMG 250900-ST	6,30 (2,50–10,00)	0,80 (0,25–2,50)	⬢			⬢	⬢	○					⬢	⬢	○				⬢	○				
 RNMA Roughing to Medium	RNMA 150600	4,00 (1,50–8,00)	0,50 (0,15–1,50)																	○					
	RNMA 2006M0	5,00 (2,00–8,50)	0,60 (0,20–2,00)																		○				
	RNMA 250900	6,00 (2,00–9,00)	0,80 (0,25–2,50)																		○				






- ⬢ First choice
- ⬢ Stock Items
- Available under request

SN – square 90° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S				
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ESV05	FTR20	FSV40	ZN10	SVN10
SNMA  Roughing	SNMA 090304	2,50 (0,20–4,50)	0,20 (0,15–0,30)														⊕				
	SNMA 090308	2,50 (0,40–4,50)	0,40 (0,20–0,60)														⊕				
	SNMA 120404	4,00 (0,20–8,00)	0,20 (0,15–0,30)														⊕	⊕			
	SNMA 120408	4,00 (0,20–8,00)	0,40 (0,20–0,60)														⊕	⊕			
	SNMA 120412	4,00 (0,30–8,00)	0,45 (0,20–0,80)														⊕	⊕			
	SNMA 120416	4,00 (0,30–8,00)	0,55 (0,20–1,00)														⊕	⊕			
	SNMA 150412	5,00 (0,30–9,00)	0,45 (0,20–0,80)														⊕	⊕			
	SNMA 150612	5,00 (0,30–10,00)	0,45 (0,20–0,80)														⊕	⊕			
	SNMA 190612	6,00 (0,30–12,00)	0,45 (0,20–0,80)														⊕	⊕			
	SNMA 190616	6,00 (0,30–12,00)	0,55 (0,20–1,00)														⊕	⊕			
	SNMA 190624	6,00 (0,30–12,00)	0,60 (0,20–1,20)														⊕	⊕			
	SNMA 250724	6,00 (0,40–12,00)	0,60 (0,20–1,40)														⊕	⊕			
SNMG-MF  Finishing	SNMG 120404-MF	0,40 (0,10–1,50)	0,10 (0,05–0,25)				⊕	⊕	○	⊕	⊕	⊕	○	⊕							
	SNMG 120408-MF	0,40 (0,10–1,50)	0,20 (0,1–0,40)				⊕	⊕	○	⊕	⊕	⊕	○	⊕							
	SNMG 120412-MF	0,80 (0,15–2,50)	0,30 (0,20–0,60)				⊕	⊕	○		⊕	⊕	○								
SNMG-SF-03  Medium to Finishing	SNMG 120404-SF	2,00 (1,00–4,00)	0,15 (0,10–0,23)										⊕	⊕					⊕	⊕	
	SNMG 120408-SF	2,00 (1,00–4,00)	0,20 (0,12–0,38)										⊕	⊕					⊕	⊕	
	SNMG 120412-SF	2,50 (1,00–4,00)	0,25 (0,15–0,55)										⊕	⊕					⊕	⊕	
SNMG-MR  Medium	SNMG 120404-MR	3,00 (0,40–6,00)	0,20 (0,10–0,30)	○			⊕	⊕	⊕												
	SNMG 120408-MR	3,00 (0,50–6,00)	0,30 (0,15–0,50)	○			⊕	⊕	⊕												
	SNMG 120412-MR	3,00 (0,80–6,00)	0,35 (0,18–0,60)	○			⊕	⊕	⊕												
	SNMG 120416-MR	3,00 (1,00–6,00)	0,40 (0,23–0,65)				○	⊕	⊕												
	SNMG 150608-MR	4,00 (0,60–7,50)	0,30 (0,15–0,50)	○			⊕	⊕	⊕												
	SNMG 150612-MR	4,00 (0,80–7,50)	0,35 (0,18–0,60)	○			⊕	⊕	⊕												
	SNMG 150616-MR	4,00 (1,00–7,50)	0,40 (0,23–0,65)				○	○	○												
	SNMG 190612-MR	5,00 (0,80–9,00)	0,35 (0,18–0,60)				⊕	⊕	⊕												
SNMG 190616-MR	5,00 (1,00–9,00)	0,40 (0,23–0,65)				⊕	⊕	⊕													




- ⊕ First choice
- ⊕ Stock Items
- Available under request

SN – square 90° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P								M				K		N		S			
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20	
 Roughing to Medium	SNMG 090304-SS	2,00 (0,50–4,50)	0,20 (0,10–0,30)										○		⊕	⊕					⊕	⊕	
	SNMG 090308-SS	2,00 (0,50–4,50)	0,25 (0,12–0,45)										○		⊕	⊕						⊕	⊕
	SNMG 120404-SS	3,00 (0,50–6,40)	0,20 (0,12–0,30)										⊕		⊕	⊕						⊕	⊕
	SNMG 120408-SS	3,00 (0,50–6,40)	0,25 (0,12–0,45)										⊕		⊕	⊕						⊕	⊕
	SNMG 120412-SS	3,00 (0,50–6,40)	0,30 (0,15–0,60)										⊕		⊕	⊕						⊕	⊕
	SNMG 120416-SS	3,00 (0,50–6,40)	0,45 (0,15–0,80)										⊕		○	○						○	○
	SNMG 150608-SS	4,00 (0,50–8,00)	0,25 (0,12–0,45)										⊕		○	○						○	○
	SNMG 150612-SS	4,00 (0,50–8,00)	0,30 (0,15–0,60)										⊕		○	○						○	○
	SNMG 190616-SS	4,00 (0,50–8,00)	0,45 (0,15–0,80)										⊕		○	○						○	○
 Medium	SNMG 090304-ST	2,50 (0,20–4,50)	0,20 (0,15–0,30)															○	○				
	SNMG 090308-ST	2,50 (0,20–4,50)	0,35 (0,15–0,50)															⊕	⊕				
	SNMG 120404-ST	3,00 (0,20–6,00)	0,20 (0,15–0,30)															○	⊕				
	SNMG 120408-ST	3,00 (0,20–6,00)	0,35 (0,15–0,50)															⊕	⊕				
	SNMG 120412-ST	3,00 (0,30–6,00)	0,40 (0,15–0,60)															⊕	⊕				
	SNMG 120416-ST	3,00 (0,30–6,00)	0,45 (0,20–0,70)															⊕	⊕				
	SNMG 150612-ST	4,00 (0,30–8,00)	0,40 (0,15–0,60)															○	○				
	SNMG 150616-ST	4,00 (0,30–8,00)	0,45 (0,20–0,70)															○	○				
	SNMG 190612-ST	4,50 (0,30–9,00)	0,40 (0,15–0,60)															⊕	⊕				
SNMG 190616-ST	4,50 (0,30–9,00)	0,45 (0,20–0,70)															⊕	⊕					
 Roughing	SNMG 120408-HR	4,00 (0,80–7,00)	0,35 (0,20–0,55)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		○	⊕	⊕				
	SNMG 120412-HR	4,00 (1,00–7,00)	0,40 (0,25–0,70)	⊕			⊕	⊕	⊕				⊕	⊕	⊕		○	⊕	⊕				
	SNMG 120416-HR	4,00 (1,50–7,00)	0,50 (0,32–0,80)	○			⊕	⊕	⊕				⊕	⊕	⊕		○	⊕	⊕				
	SNMG 150612-HR	4,00 (1,00–8,00)	0,40 (0,25–0,70)				○	⊕	⊕				○	⊕	⊕		○	○	⊕				
	SNMG 150616-HR	4,00 (1,50–8,00)	0,50 (0,32–0,80)				○	⊕	⊕				○	⊕	⊕		○	○	⊕				
	SNMG 190612-HR	5,00 (1,00–10,00)	0,40 (0,25–0,70)				⊕	⊕	⊕				⊕	⊕	⊕		○	○	⊕				
	SNMG 190616-HR	5,00 (1,50–10,00)	0,50 (0,32–0,80)				⊕	⊕	⊕				⊕	⊕	⊕		○	○	⊕				
	SNMG 250924-HR	6,00 (2,00–15,00)	1,00 (0,40–1,20)						⊕	⊕				⊕	⊕				⊕				
 NEW Roughing	SNMM 190612-RP	5,50 (2,00–12,00)	0,60 (0,30–0,85)	○			⊕	⊕					⊕	⊕			○						
	SNMM 190616-RP	6,00 (2,00–12,00)	0,60 (0,35–1,00)	○			⊕	⊕					⊕	⊕			○						
	SNMM 190624-RP	6,00 (2,00–12,00)	0,80 (0,50–1,50)	○			⊕	⊕					⊕	⊕			○						
 Heavy to Roughing	SNMM 190612-HY	6,00 (2,00–12,00)	0,60 (0,35–0,90)				⊕	⊕	⊕				⊕	⊕	⊕								
	SNMM 190616-HY	6,00 (2,00–12,00)	0,60 (0,35–1,20)				⊕	⊕	⊕				⊕	⊕	⊕								
	SNMM 190624-HY	6,00 (2,00–12,00)	1,00 (0,60–1,60)				⊕	⊕	⊕				⊕	⊕	⊕								
	SNMM 250724-HY	8,50 (2,50–15,00)	1,00 (0,60–1,60)				⊕	⊕	⊕				⊕	⊕	⊕								
	SNMM 250924-HY	8,50 (3,00–15,00)	1,00 (0,60–1,60)				⊕	⊕	⊕				⊕	⊕	⊕								

⊕ First choice ⊕ Stock Items ○ Available under request

SN – square 90° negative






Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K		N		S		
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10
SNMM-HZ  Heavy to Roughing	SNMM 190612-HZ	10,00 (2,40–13,00)	0,60 (0,35–0,90)	○			⊕	⊕	⊕								⊕	⊕			
	SNMM 190616-HZ	10,00 (2,40–13,00)	0,60 (0,35–1,20)	○			⊕	⊕	⊕								⊕	⊕			
	SNMM 190624-HZ	10,00 (3,20–13,00)	1,00 (0,60–1,60)	○			⊕	⊕	⊕								⊕	⊕			
	SNMM 250724-HZ	10,00 (3,20–17,00)	1,00 (0,60–1,60)				⊕	⊕	⊕								⊕	⊕			
	SNMM 250732-HZ	10,00 (3,20–17,00)	1,20 (0,80–1,80)				○	⊕	○								○	○			
	SNMM 250924-HZ	10,00 (3,20–17,00)	1,00 (0,60–1,60)				⊕	⊕	⊕								⊕	⊕			
SNGN  Medium to Finishing	SNGN 090308	2,00 (1,20–3,50)	0,18 (0,10–0,53)					○													
	SNGN 120308	3,00 (1,30–5,00)	0,20 (0,12–0,53)					○													
	SNGN 120312	3,00 (2,00–5,00)	0,30 (0,18–0,80)					○													
	SNGN 120408	3,00 (1,50–5,00)	0,20 (0,12–0,53)					○													
	SNGN 120412	3,00 (2,00–5,00)	0,30 (0,20–0,80)					○													
	SNGN 120416	3,00 (2,20–5,00)	0,35 (0,25–1,07)					○													
	SNGN 150408	3,50 (2,40–8,00)	0,22 (0,15–0,53)					○													
	SNGN 150412	3,50 (2,60–8,00)	0,35 (0,20–0,80)					○													
	SNGN 190412	4,50 (3,00–10,00)	0,35 (0,25–0,80)					○													
SNUN  Roughing to Medium	SNUN 090304	2,00 (1,00–3,50)	0,15 (0,10–0,30)					○						○							
	SNUN 090308	2,00 (1,20–3,50)	0,35 (0,23–0,60)					○													
	SNUN 120304	3,00 (1,30–5,00)	0,15 (0,10–0,30)					○													
	SNUN 120308	3,00 (1,50–5,00)	0,35 (0,23–0,60)					○													
	SNUN 120312	3,00 (2,00–5,00)	0,45 (0,25–1,00)					○													
	SNUN 120404	3,00 (1,30–5,00)	0,15 (0,10–0,30)					○													
	SNUN 120408	3,00 (1,50–5,00)	0,35 (0,23–0,60)					○													
	SNUN 120412	3,00 (2,00–5,00)	0,45 (0,25–1,00)					○													
	SNUN 120416	3,00 (2,20–5,00)	0,60 (0,25–1,20)					○													
	SNUN 150408	3,50 (2,40–8,00)	0,35 (0,23–0,60)					○													
	SNUN 150412	3,50 (2,60–8,00)	0,45 (0,25–0,60)					○													
	SNUN 150416	3,50 (2,90–8,00)	0,60 (0,25–1,20)					○													
	SNUN 190408	4,50 (2,70–10,00)	0,35 (0,23–0,60)					○													
	SNUN 190412	4,50 (3,00–10,00)	0,60 (0,30–1,00)					○													
	SNUN 190416	4,50 (3,20–10,00)	0,65 (0,25–1,20)					○													
	SNUN 190608	4,50 (2,70–10,00)	0,35 (0,23–0,60)					○													
	SNUN 250620	5,50 (3,00–12,00)	1,00 (0,30–1,50)					○													
	SNUN 250720	5,50 (2,00–12,00)	1,00 (0,30–1,50)					○													

⊕ First choice

⊖ Stock Items





○ Available under request

TN – triangular 60° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K		N		S					
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20		
TNMA  Roughing	TNMA 110304	2,00 (0,15–4,00)	0,20 (0,10–0,30)																			⊕	⊕	
	TNMA 110308	2,00 (0,15–4,00)	0,35 (0,15–0,60)																				⊕	⊕
	TNMA 160304	2,50 (0,20–5,00)	0,20 (0,10–0,30)																				⊕	⊕
	TNMA 160308	2,50 (0,20–5,00)	0,35 (0,15–0,60)																				⊕	⊕
	TNMA 160404	2,50 (0,20–5,00)	0,20 (0,10–0,30)																				⊕	⊕
	TNMA 160408	3,50 (0,20–7,00)	0,35 (0,15–0,60)																				⊕	⊕
	TNMA 160412	3,50 (0,30–7,00)	0,45 (0,20–0,80)																				⊕	⊕
	TNMA 160416	3,50 (0,30–7,00)	0,55 (0,20–1,00)																				⊕	⊕
	TNMA 220404	4,00 (0,20–10,00)	0,20 (0,10–0,30)																				⊕	⊕
	TNMA 220408	5,00 (0,20–10,00)	0,35 (0,15–0,60)																				⊕	⊕
	TNMA 220412	5,00 (0,30–10,00)	0,45 (0,20–0,80)																				⊕	⊕
	TNMA 220416	5,00 (0,30–10,00)	0,55 (0,20–1,00)																				⊕	⊕
	TNMA 220432	5,00 (0,50–10,00)	0,60 (0,50–1,20)																				○	⊕
	TNMA 270608	5,00 (0,30–12,00)	0,35 (0,15–0,60)																				⊕	⊕
	TNMA 270612	5,00 (0,30–12,00)	0,45 (0,20–0,80)																				⊕	⊕
	TNMA 270616	5,00 (0,30–12,00)	0,55 (0,20–1,00)																				⊕	⊕
TNMA 330724	6,50 (0,30–15,00)	0,60 (0,30–2,00)																				⊕	⊕	
TNMG -MF  Finishing	TNMG 160404-MF	0,40 (0,10–1,50)	0,15 (0,05–0,25)				⊕	⊕		⊕	⊕		⊕											
	TNMG 160408-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)				⊕	⊕		⊕	⊕		⊕											
	TNMG 160412-MF	1,00 (0,20–2,50)	0,30 (0,15–0,60)				⊕	⊕		○			⊕	⊕		○								
	TNMG 220408-MF	1,50 (0,25–2,50)	0,20 (0,10–0,40)				⊕	○			⊕	○												
TNMG -MS  Medium to Finishing	TNMG 160404-MS	2,00 (0,30–3,80)	0,15 (0,10–0,20)																			⊕	⊕	
	TNMG 160408-MS	2,00 (0,0–3,80)	0,25 (0,10–0,40)																			⊕	⊕	
	TNMG 160412-MS	2,00 (0,40–3,80)	0,30 (0,15–0,60)																			⊕	⊕	
TNMG -SF  Medium to Finishing	TNMG 160404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)																			⊕	⊕	
	TNMG 160408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)																			⊕	⊕	
	TNMG 160412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)																			⊕	⊕	
	TNMG 220404-SF	1,50 (0,60–3,00)	0,20 (0,10–0,35)																			⊕	⊕	
	TNMG 220408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,40)																			⊕	⊕	
	TNMG 220412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)																			⊕	⊕	
TNMG -LC  Medium to Finishing	TNMG 160404-LC	1,00 (0,40–2,50)	0,15 (0,07–0,30)				⊕	⊕																
	TNMG 160408-LC	1,50 (0,40–2,50)	0,20 (0,10–0,40)				⊕	⊕																
	TNMG 160412-LC	2,00 (0,80–3,00)	0,25 (0,15–0,50)				⊕	⊕																
	TNMG 220408-LC	2,00 (0,40–3,00)	0,20 (0,10–0,40)				⊕	⊕																
	TNMG 220412-LC	2,50 (0,80–3,50)	0,25 (0,15–0,50)				⊕	⊕																

⊕ First choice ⊕ Stock Items ○ Available under request

TN – triangular 60° negative




Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S					
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ESV05	FTR20	FSV40	ZN10	SVN10	SVN20
 Medium	TNMG 160308-MR	2,80 (0,30–5,00)	0,30 (0,15–0,50)				⊕	⊕														
	TNMG 160404-MR	3,00 (0,40–5,00)	0,20 (0,10–0,30)	○			⊕	⊕	⊕													
	TNMG 160408-MR	3,00 (0,50–5,00)	0,30 (0,15–0,50)	○			⊕	⊕	⊕													
	TNMG 160412-MR	3,00 (0,80–5,00)	0,35 (0,18–0,60)	○			⊕	⊕	⊕													
	TNMG 160416-MR	3,00 (0,80–5,00)	0,40 (0,23–0,70)				○	○	○													
	TNMG 220404-MR	4,00 (0,40–6,60)	0,20 (0,10–0,30)	○			⊕	⊕	⊕													
	TNMG 220408-MR	4,00 (0,50–6,60)	0,30 (0,15–0,50)	○			⊕	⊕	⊕													
	TNMG 220412-MR	4,00 (0,80–6,60)	0,35 (0,18–0,60)	○			⊕	⊕	⊕													
	TNMG 220416-MR	4,00 (1,00–6,60)	0,40 (0,23–0,70)				⊕	⊕														
 Medium	TNMG 160404-PM	3,00 (0,40–5,00)	0,20 (0,10–0,30)		⊕	⊕																
	TNMG 160408-PM	3,00 (0,50–5,00)	0,30 (0,15–0,50)		⊕	⊕																
	TNMG 160412-PM	3,00 (0,80–5,00)	0,35 (0,18–0,60)		⊕	⊕																
	TNMG 160416-PM	3,00 (1,00–5,00)	0,40 (0,23–0,65)		⊕	⊕																
	TNMG 220404-PM	4,00 (0,40–6,60)	0,20 (0,10–0,30)		⊕	⊕																
	TNMG 220408-PM	4,00 (0,50–6,60)	0,30 (0,15–0,50)		⊕	⊕																
	TNMG 220412-PM	4,00 (0,80–6,60)	0,35 (0,18–0,60)		⊕	⊕																
	TNMG 220416-PM	4,00 (1,00–6,60)	0,40 (0,23–0,60)		⊕	⊕																
 Medium Wiper	TNMG 160408-MW	2,00 (0,50–4,50)	0,35 (0,15–0,60)				⊕	⊕	⊕	⊕	⊕	⊕		○	⊕							
	TNMG 160412-MW	2,50 (0,50–5,00)	0,50 (0,25–0,90)				⊕	⊕	⊕	⊕	⊕	⊕		○	⊕							
 Roughing to Medium	TNMG 160404-SS	2,00 (0,50–4,00)	0,20 (0,10–0,30)							⊕	⊕	⊕	⊕	⊕						⊕	⊕	
	TNMG 160408-SS	3,00 (0,50–4,80)	0,25 (0,12–0,45)							⊕	⊕	⊕	⊕	⊕							⊕	⊕
	TNMG 160412-SS	3,00 (0,50–4,80)	0,30 (0,15–0,60)							⊕	⊕	⊕	⊕	⊕							⊕	⊕
	TNMG 220408-SS	4,00 (0,50–6,60)	0,25 (0,12–0,45)							⊕	⊕	⊕	⊕	⊕							⊕	⊕
	TNMG 220412-SS	4,00 (0,50–6,60)	0,30 (0,15–0,60)							⊕		○	⊕								○	⊕

⊕ First choice

⊖ Stock Items







○ Available under request

TN – triangular 60° negative

Inserts	ISO Reference	ap (mm)	fn (mm)	P								M					K	N	S	
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10
TNMG-ST  Medium	TNMG 110304-ST	2,00 (0,15–4,50)	0,22 (0,15–0,30)														○			
	TNMG 110308-ST	2,00 (0,15–4,50)	0,35 (0,15–0,50)														⊕			
	TNMG 160304-ST	3,00 (0,20–5,50)	0,22 (0,15–0,30)														⊕			
	TNMG 160308-ST	3,00 (0,20–5,50)	0,35 (0,15–0,50)														⊕			
	TNMG 160404-ST	3,00 (0,20–5,50)	0,22 (0,15–0,30)														⊕	⊕		
	TNMG 160408-ST	3,00 (0,20–5,50)	0,35 (0,15–0,50)														⊕	⊕		
	TNMG 160412-ST	3,00 (0,30–5,50)	0,40 (0,15–0,60)														⊕	⊕		
	TNMG 160416-ST	3,00 (0,30–5,50)	0,40 (0,15–0,60)														⊕	⊕		
	TNMG 220404-ST	4,00 (0,20–8,00)	0,22 (0,15–0,30)														⊕	⊕		
	TNMG 220408-ST	4,00 (0,20–8,00)	0,35 (0,15–0,50)														⊕	⊕		
	TNMG 220412-ST	4,00 (0,30–8,00)	0,40 (0,15–0,60)														⊕	⊕		
	TNMG 220416-ST	4,00 (0,30–8,00)	0,45 (0,20–0,70)														⊕	⊕		
	TNMG 270608-ST	4,40 (0,30–8,80)	0,35 (0,15–0,50)														○			
	TNMG 270612-ST	4,40 (0,30–8,80)	0,40 (0,15–0,60)														○			
	TNMG 270616-ST	4,40 (0,30–8,80)	0,45 (0,20–0,70)														○			
	TNMG 330924-ST	4,80 (0,30–10,50)	0,60 (0,25–1,40)														○			
TNMG-HR  Roughing	TNMG 160408-HR	3,00 (0,80–6,00)	0,35 (0,20–0,55)	⊕		⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	TNMG 160412-HR	3,00 (1,00–6,00)	0,40 (0,25–0,70)	⊕		⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	TNMG 220408-HR	4,00 (0,80–6,50)	0,35 (0,20–0,55)	⊕		⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	TNMG 220412-HR	4,00 (1,00–7,00)	0,40 (0,25–0,70)	⊕		⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	TNMG 220416-HR	4,00 (1,50–7,00)	0,60 (0,25–0,90)	⊕		⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	TNMG 270612-HR	6,00 (2,00–10,00)	0,40 (0,25–0,70)				○	○	⊕		○	⊕		○	○	⊕				
	TNMG 270616-HR	6,00 (2,00–10,00)	0,60 (0,35–0,90)				○	○			○	○		○	○	○				
	TNMG 330924-HR	7,00 (2,00–12,00)	0,80 (0,40–1,20)				○	○			○	○		○	○					
TNMX-01  Medium to Finishing	TNMX 160404-L01	2,50 (1,00–3,50)	0,15 (0,12–0,30)			⊕	⊕	○		⊕	⊕	○								
	TNMX 160404-R01	2,50 (1,00–3,50)	0,15 (0,12–0,30)			⊕	⊕	○		⊕	⊕	○								
	TNMX 160408-L01	2,50 (1,30–3,50)	0,30 (0,15–0,50)			⊕	⊕	○		⊕	⊕	○								
	TNMX 160408-R01	2,50 (1,30–3,50)	0,30 (0,15–0,50)			⊕	⊕	○		⊕	⊕	○								

- ⊕ First choice
- ⊗ Stock Items
- Available under request

WN – trigon 80° negative






Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K	N	S						
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20	
 VNMA Roughing	WNMA 060408	2,50 (0,20–4,00)	0,35 (0,15–0,60)														⊕	⊕					
	WNMA 080404	2,80 (0,20–5,00)	0,22 (0,15–0,30)															⊕	⊕				
	WNMA 080408	3,00 (0,20–5,00)	0,35 (0,15–0,60)															⊕	⊕				
	WNMA 080412	3,00 (0,30–5,00)	0,45 (0,20–0,80)															⊕	⊕				
	WNMA 080416	3,00 (0,30–5,00)	0,55 (0,20–1,00)															⊕	⊕				
 VNMG-MF Roughing	WNMG 06T304-MF	0,40 (0,10–1,50)	0,15 (0,05–0,30)				⊕	⊕	○		⊕	⊕	○										
	WNMG 06T308-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)				⊕	⊕	○		⊕	⊕	○										
	WNMG 06T312-MF	0,40 (0,15–1,50)	0,30 (0,15–0,60)				⊕	⊕			⊕	⊕	○										
	WNMG 060404-MF	0,40 (0,10–1,50)	0,15 (0,05–0,30)				⊕	⊕	○		⊕	⊕	○										
	WNMG 060408-MF	0,40 (0,10–1,50)	0,20 (0,10–0,40)				⊕	⊕	○		⊕	⊕	○										
	WNMG 060412-MF	0,40 (0,15–1,50)	0,30 (0,15–0,60)				⊕	⊕	○		⊕	⊕	○										
	WNMG 080404-MF	0,60 (0,10–2,00)	0,15 (0,05–0,30)				⊕	⊕	○		⊕	⊕	○										
	WNMG 080408-MF	0,60 (0,10–2,00)	0,20 (0,10–0,40)				⊕	⊕	○		⊕	⊕	○										
WNMG 080412-MF	0,60 (0,15–2,00)	0,30 (0,15–0,60)				⊕	⊕	○		⊕	⊕	○											
 VNMG-MS Medium to Finishing	WNMG 060404-MS	1,20 (0,30–2,20)	0,15 (0,10–0,20)																			⊕	
	WNMG 060408-MS	1,20 (0,30–2,20)	0,25 (0,20–0,40)																				⊕
	WNMG 080408-MS	2,50 (0,70–4,00)	0,25 (0,20–0,40)																				⊕
	WNMG 080412-MS	2,50 (1,00–4,00)	0,30 (0,25–0,55)																				⊕
 VNMG-SF Medium to Finishing	WNMG 060404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)																			⊕	
	WNMG 060408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)																				⊕
	WNMG 060412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)																				⊕
	WNMG 080404-SF	1,50 (0,60–3,00)	0,15 (0,10–0,23)																				⊕
	WNMG 080408-SF	1,50 (0,60–3,00)	0,25 (0,12–0,38)																				⊕
WNMG 080412-SF	1,50 (0,60–3,00)	0,35 (0,15–0,55)																				⊕	
 VNMG-LC Medium to Finishing	WNMG 080408-LC	1,50 (0,40–2,50)	0,15 (0,10–0,35)				⊕	⊕															
 VNMG-MR Medium	WNMG 06T304-MR	2,00 (0,50–3,00)	0,22 (0,10–0,30)				⊕	⊕	○														
	WNMG 06T308-MR	2,00 (0,50–3,00)	0,30 (0,15–0,50)				⊕	⊕	○														
	WNMG 06T312-MR	2,00 (0,80–3,00)	0,35 (0,18–0,60)				⊕	⊕	○														
	WNMG 060404-MR	2,00 (0,50–3,00)	0,22 (0,10–0,30)				⊕	⊕	○														
	WNMG 060408-MR	2,00 (0,50–3,00)	0,30 (0,15–0,50)				⊕	⊕	○														
	WNMG 060412-MR	2,00 (0,80–3,00)	0,35 (0,18–0,60)				⊕	⊕	○														
	WNMG 080404-MR	2,50 (0,50–4,00)	0,22 (0,10–0,30)	○			⊕	⊕	⊕														
	WNMG 080408-MR	2,50 (0,50–4,00)	0,30 (0,15–0,50)	○			⊕	⊕	⊕														
	WNMG 080412-MR	2,50 (0,80–4,00)	0,35 (0,18–0,60)	○			⊕	⊕	⊕														
WNMG 080416-MR	3,00 (1,00–4,00)	0,40 (0,23–0,65)				⊕	⊕	⊕															

⊕ First choice

⊙ Stock Items

○ Available under request

WN – trigon 80° negative







Inserts	ISO Reference	ap (mm)	fn (mm)	P								M					K	N	S		
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FSV40	ZN10	SVN10
WNMG-PM  NEW Medium	WNMG 080404-PM	2,50 (0,50–4,00)	0,22 (0,10–0,30)	⊕	⊕																
	WNMG 080408-PM	2,50 (0,50–4,00)	0,30 (0,15–0,50)	⊕	⊕																
	WNMG 080412-PM	2,50 (0,80–4,00)	0,35 (0,18–0,60)	⊕	⊕																
	WNMG 080416-PM	3,00 (1,00–4,50)	0,35 (0,20–0,65)	⊕	⊕																
WNMG-MW  Medium	WNMG 060408-MW	1,50 (0,50–3,50)	0,30 (0,15–0,60)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	WNMG 060412-MW	1,50 (0,80–3,50)	0,50 (0,20–0,90)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	WNMG 080408-MW	3,00 (0,50–5,00)	0,30 (0,15–0,60)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
	WNMG 080412-MW	3,50 (0,80–6,00)	0,50 (0,20–0,90)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		○	⊕					
WNMG-SS  Roughing to Medium	WNMG 06T304-SS	2,00 (0,50–3,00)	0,20 (0,12–0,30)								○	○	○						○	○	
	WNMG 06T308-SS	2,00 (0,50–3,00)	0,25 (0,12–0,45)								○	○	○						○	○	
	WNMG 060404-SS	2,00 (0,50–3,00)	0,20 (0,12–0,30)								⊕	⊕	⊕	⊕					⊕	⊕	
	WNMG 060408-SS	2,00 (0,50–3,00)	0,25 (0,12–0,45)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	WNMG 080404-SS	2,00 (0,50–3,00)	0,20 (0,12–0,30)								⊕	⊕	⊕	⊕					⊕	⊕	
	WNMG 080408-SS	2,50 (0,50–4,00)	0,25 (0,12–0,45)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
	WNMG 080412-SS	2,50 (0,50–4,00)	0,30 (0,15–0,60)								⊕	⊕	⊕	⊕	⊕				⊕	⊕	
WNMG-ST  Medium	WNMG 080404-ST	2,50 (0,20–5,00)	0,22 (0,15–0,30)												⊕	⊕					
	WNMG 080408-ST	2,50 (0,20–5,00)	0,35 (0,15–0,50)												⊕	⊕					
	WNMG 080412-ST	2,50 (0,30–5,00)	0,40 (0,15–0,60)												⊕	⊕					
	WNMG 080416-ST	2,50 (0,30–5,00)	0,45 (0,20–0,70)												⊕	⊕					
WNMG-HR  Roughing	WNMG 080408-HR	4,00 (0,80–5,00)	0,35 (0,20–0,55)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				
	WNMG 080412-HR	4,00 (1,50–5,00)	0,40 (0,25–0,70)	⊕			⊕	⊕	⊕		⊕	⊕	⊕		⊕	⊕	⊕				

⊕ First choice

⊖ Stock Items



○ Available under request

CC – rhombic 80° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
 Fine Finishing Wiper	CCMT 060204-FW	0,80 (0,30–2,00)	0,12 (0,05–0,30)			⦿						⦿			⦿						⦿	
	CCMT 060208-FW	0,80 (0,30–2,00)	0,15 (0,09–0,35)			⦿						⦿			⦿						⦿	
	CCMT 09T304-FW	1,00 (0,30–3,00)	0,20 (0,07–0,30)			⦿						⦿			⦿						⦿	
	CCMT 09T308-FW	1,00 (0,30–3,00)	0,25 (0,12–0,50)			⦿						⦿			⦿						⦿	
 Finishing	CCMT 060204-LM	0,50 (0,20–2,00)	0,10 (0,08–0,20)									⦿	⦿								⦿	⦿
	CCMT 09T304-LM	0,50 (0,25–2,50)	0,15 (0,10–0,30)									⦿	⦿								⦿	⦿
	CCMT 120404-LM	0,80 (0,30–3,00)	0,18 (0,12–0,35)									⦿	⦿								⦿	⦿
 Finishing	CCMT 060204-MP	0,64 (0,20–2,40)	0,11 (0,06–0,17)			⦿	⦿		○	⦿												
	CCMT 060208-MP	0,64 (0,40–2,40)	0,18 (0,08–0,35)			⦿	⦿		○	○												
	CCMT 09T304-MP	0,64 (0,25–3,00)	0,15 (0,08–0,23)			⦿	⦿		○	⦿												
	CCMT 09T308-MP	0,80 (0,50–3,00)	0,20 (0,10–0,40)			⦿	⦿		○	⦿												
	CCMT 120404-MP	0,96 (0,30–3,60)	0,18 (0,09–0,27)			⦿	⦿		○	○												
	CCMT 120408-MP	0,96 (0,60–3,60)	0,24 (0,12–0,45)			⦿	⦿		○	⦿												
	CCMT 120412-MP	0,96 (0,72–3,60)	0,35 (0,14–0,60)			⦿	⦿		○	○												
 Finishing	CCMT 060204-MM	0,64 (0,20–2,40)	0,11 (0,06–0,17)								⦿		⦿								⦿	⦿
	CCMT 060208-MM	0,64 (0,40–2,40)	0,18 (0,08–0,35)								⦿		○	⦿							○	⦿
	CCMT 09T304-MM	0,64 (0,25–3,00)	0,15 (0,08–0,23)								⦿		⦿	⦿							⦿	⦿
	CCMT 09T308-MM	0,80 (0,50–3,00)	0,20 (0,10–0,40)								⦿		⦿	⦿							⦿	⦿
	CCMT 120404-MM	0,96 (0,30–3,60)	0,18 (0,09–0,27)								⦿		○	⦿							○	⦿
	CCMT 120408-MM	0,96 (0,60–3,60)	0,26 (0,12–0,45)								⦿		⦿	⦿							⦿	⦿
	CCMT 120412-MM	0,96 (0,72–3,60)	0,35 (0,14–0,60)								⦿		○	⦿							○	⦿
 Finishing	CCMT 060204-MK	0,64 (0,20–2,40)	0,11 (0,06–0,17)																		⦿	⦿
	CCMT 060208-MK	0,64 (0,40–2,40)	0,18 (0,08–0,35)																		⦿	⦿
	CCMT 09T304-MK	0,64 (0,25–3,00)	0,15 (0,08–0,23)																		⦿	⦿
	CCMT 09T308-MK	0,80 (0,50–3,00)	0,20 (0,10–0,40)																		⦿	⦿
	CCMT 120404-MK	0,96 (0,30–3,60)	0,18 (0,09–0,27)																		⦿	⦿
	CCMT 120408-MK	0,96 (0,60–3,60)	0,24 (0,12–0,45)																		⦿	⦿
 Finishing Wiper	CCMT 060208-MW	1,20 (0,50–2,50)	0,20 (0,10–0,40)			⦿					⦿			⦿						⦿		⦿
	CCMT 09T304-MW	1,50 (0,50–4,00)	0,25 (0,12–0,40)			⦿					⦿			⦿							⦿	
	CCMT 09T308-MW	1,50 (0,70–4,00)	0,30 (0,15–0,50)			⦿					⦿			⦿							⦿	
	CCMT 120404-MW	2,00 (0,50–4,00)	0,25 (0,15–0,40)			⦿					⦿			⦿							⦿	
	CCMT 120408-MW	2,00 (0,70–4,00)	0,30 (0,15–0,50)			⦿					⦿			⦿							⦿	








⦿ First choice ⦿ Stock Items ○ Available under request

CC – rhombic 80° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S				
				FTR20	GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FTR20	FSV40	ZN10	SVN10	SVN20	
 CCGT-FS Finishing to Fine Finishing	CCGT 060201-FS	0,30 (0,10–1,00)	0,03 (0,01–0,06)									⊕	⊕								⊕	⊕		
	CCGT 060202-FS	0,50 (0,10–1,50)	0,07 (0,02–0,12)											⊕	⊕							⊕	⊕	
	CCGT 060204-FS	0,80 (0,15–1,50)	0,20 (0,08–0,25)												⊕	⊕							⊕	⊕
	CCGT 09T301-FS	0,50 (0,10–1,50)	0,03 (0,01–0,06)																				⊕	⊕
	CCGT 09T302-FS	1,00 (0,10–2,00)	0,07 (0,02–0,12)																				⊕	⊕
	CCGT 09T304-FS	1,25 (0,15–2,50)	0,15 (0,08–0,25)																				⊕	⊕
 CCGT-LN Finishing to Fine Finishing	CCGT 060202-LN	1,00 (0,05–3,00)	0,07 (0,05–0,12)																		⊕			
	CCGT 060204-LN	1,55 (0,10–3,00)	0,15 (0,10–0,20)																			⊕		
	CCGT 09T302-LN	1,53 (0,05–3,00)	0,07 (0,05–0,12)																			⊕		
	CCGT 09T304-LN	2,55 (0,10–5,00)	0,16 (0,10–0,22)																			⊕		
	CCGT 09T308-LN	2,55 (0,10–5,00)	0,22 (0,15–0,45)																			⊕		
	CCGT 120402-LN	2,03 (0,05–4,00)	0,07 (0,05–0,12)																			⊕		
	CCGT 120404-LN	2,55 (0,10–5,00)	0,17 (0,10–0,26)																			⊕		
	CCGT 120408-LN	2,80 (0,10–5,50)	0,25 (0,15–0,50)																			⊕		






- ⊕ First choice
- ⊗ Stock Items
- Available under request

DC — rhombic 55° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P				M				K			N		S					
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	FSV05	FTR20	FTR20	FSV40	ZN10	SVN10	SVN20
 Finishing	DCMW 070202	1,60 (0,05–3,20)	0,10 (0,04–0,13)											◆								
	DCMW 070204	1,60 (0,05–3,20)	0,20 (0,08–0,26)											◆								
	DCMW 070208	1,60 (0,05–3,20)	0,40 (0,16–0,53)											◆								
	DCMW 11T302	2,40 (0,05–4,80)	0,10 (0,04–0,13)											◆								
	DCMW 11T304	2,40 (0,05–4,80)	0,20 (0,08–0,26)											◆								
	DCMW 11T308	2,40 (0,05–4,80)	0,40 (0,16–0,53)											◆								
	DCMW 150404	2,80 (0,10–5,50)	0,20 (0,10–0,26)											◆								
	DCMW 150408	2,80 (0,10–5,50)	0,40 (0,16–0,53)											◆								
 Fine Finishing	DCMT 070202-FP	0,26 (0,06–1,50)	0,06 (0,03–0,11)			○ ◆	○ ○															
	DCMT 070204-FP	0,26 (0,08–1,50)	0,08 (0,05–0,17)			◆	◆	○ ○														
	DCMT 11T302-FP	0,35 (0,08–2,00)	0,08 (0,04–0,15)			○ ◆	○ ◆															
	DCMT 11T304-FP	0,35 (0,11–2,00)	0,11 (0,06–0,23)			◆	◆	○ ○														
	DCMT 11T308-FP	0,35 (0,15–2,00)	0,15 (0,08–0,30)			◆	◆	○ ○														
 Fine Finishing	DCMT 070202-FM	0,26 (0,06–1,50)	0,06 (0,03–0,11)								○ ◆									○ ◆		
	DCMT 070204-FM	0,26 (0,08–1,50)	0,08 (0,05–0,17)							◆	○ ◆									○ ◆		
	DCMT 11T302-FM	0,35 (0,08–2,00)	0,08 (0,04–0,15)								◆	◆								◆	◆	
	DCMT 11T304-FM	0,35 (0,11–2,00)	0,11 (0,06–0,23)							◆	◆	◆								◆	◆	
	DCMT 11T308-FM	0,35 (0,15–2,00)	0,15 (0,08–0,30)							◆	◆	◆								◆	◆	
 Fine Finishing	DCMT 070202-FK	0,26 (0,06–1,50)	0,06 (0,03–0,11)											◆								
	DCMT 070204-FK	0,26 (0,08–1,50)	0,08 (0,05–0,17)											◆								
	DCMT 11T302-FK	0,35 (0,08–2,00)	0,08 (0,04–0,15)											◆								
	DCMT 11T304-FK	0,35 (0,11–2,00)	0,11 (0,06–0,23)											◆								
 Fine Finishing Wiper	DCMT 070204-FW	0,70 (0,30–2,00)	0,12 (0,05–0,25)			◆						◆		◆							◆	
	DCMT 070208-FW	0,70 (0,30–2,00)	0,15 (0,09–0,35)			◆						◆		◆								◆
	DCMT 11T304-FW	1,00 (0,30–3,00)	0,20 (0,07–0,30)			◆						◆		◆								◆
	DCMT 11T308-FW	1,00 (0,30–3,00)	0,25 (0,12–0,40)			◆						◆		◆								◆
 Fine Finishing Wiper	DCMT 11T304-LM	0,50 (0,15–2,50)	0,15 (0,08–0,25)									◆	◆							◆	◆	
	DCMT 11T308-LM	0,20 (0,20–2,50)	0,20 (0,10–0,35)									◆	◆								◆	◆
 Finishing	DCMT 070204-MP	0,60 (0,19–2,25)	0,11 (0,06–0,17)			◆	◆	○	◆													
	DCMT 070208-MP	0,60 (0,38–2,25)	0,20 (0,08–0,35)			◆	◆	○	○													
	DCMT 11T304-MP	0,80 (0,25–3,00)	0,15 (0,08–0,23)			◆	◆	○	◆													
	DCMT 11T308-MP	0,80 (0,50–3,00)	0,25 (0,10–0,40)			◆	◆	○	◆													
	DCMT 11T312-MP	0,80 (0,60–3,00)	0,35 (0,12–0,60)			◆	◆	○	○													









◆ First choice ◆ Stock Items ○ Available under request

DC – rhombic 55° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
DCMT-MM  Finishing	DCMT 070204-MM	0,60 (0,19–2,25)	0,11 (0,06–0,17)								⊕		⊕	⊕						⊕	⊕	
	DCMT 070208-MM	0,60 (0,38–2,25)	0,20 (0,08–0,35)								⊕		○	⊕						○	⊕	
	DCMT 11T304-MM	0,80 (0,25–3,00)	0,15 (0,08–0,23)								⊕		⊕	⊕						⊕	⊕	
	DCMT 11T308-MM	0,80 (0,50–3,00)	0,25 (0,10–0,40)								⊕		⊕	⊕						⊕	⊕	
	DCMT 11T312-MM	0,80 (0,60–3,00)	0,35 (0,12–0,60)								⊕		○	⊕						○	⊕	
DCMT-MK  Finishing	DCMT 070204-MK	0,60 (0,19–2,25)	0,11 (0,06–0,17)												⊕	⊕						
	DCMT 070208-MK	0,60 (0,38–2,25)	0,20 (0,08–0,35)												⊕	⊕						
	DCMT 11T304-MK	0,80 (0,25–3,00)	0,15 (0,08–0,23)												⊕	⊕						
	DCMT 11T308-MK	0,80 (0,50–3,00)	0,25 (0,10–0,40)												⊕	⊕						
	DCMT 11T312-MK	0,80 (0,50–3,00)	0,35 (0,12–0,60)												⊕	⊕						
DCMT-MW  Finishing Wiper	DCMT 11T304-MW	1,50 (0,50–4,00)	0,25 (0,12–0,40)			⊕					⊕			⊕		○	⊕				⊕	
	DCMT 11T308-MW	1,50 (0,50–4,00)	0,30 (0,15–0,50)			⊕					⊕			⊕		○	⊕					⊕
DCGT-FS  Finishing to Fine Finishing	DCGT 070201-FS	0,30 (0,10–1,00)	0,03 (0,01–0,06)																	⊕	⊕	
	DCGT 070202-FS	0,50 (0,10–1,50)	0,07 (0,02–0,12)																		⊕	⊕
	DCGT 070204-FS	0,80 (0,15–1,50)	0,15 (0,08–0,25)																		⊕	⊕
	DCGT 11T301-FS	0,50 (0,10–1,50)	0,03 (0,01–0,06)																		⊕	⊕
	DCGT 11T302-FS	1,00 (0,10–2,00)	0,07 (0,02–0,12)																		⊕	⊕
	DCGT 11T304-FS	1,50 (0,15–3,00)	0,15 (0,08–0,25)																		⊕	⊕
DCGT-LN  Finishing to Fine Finishing	DCGT 070202-LN	1,00 (0,05–3,00)	0,07 (0,05–0,12)																	⊕		
	DCGT 070204-LN	2,05 (0,10–4,00)	0,15 (0,10–0,20)																		⊕	
	DCGT 11T302-LN	2,03 (0,05–4,00)	0,07 (0,05–0,12)																		⊕	
	DCGT 11T304-LN	2,55 (0,10–5,00)	0,16 (0,10–0,22)																		⊕	
	DCGT 11T308-LN	2,55 (0,10–5,00)	0,22 (0,15–0,50)																		⊕	
	DCGT 11T312-LN	2,70 (0,15–5,00)	0,35 (0,15–0,70)																		⊕	








- ⊕ First choice
- ⊗ Stock Items
- Available under request

RC — round R° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N	S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10
 <p>Medium</p>	RCMT 0602M0-CP	1,50 (0,50–2,40)	0,15 (0,04–0,17)			◆	◆			◆	◆				◆						
 <p>Roughing to Medium</p>	RCMT 0602M0-CP	2,00 (0,80–3,20)	0,20 (0,10–0,80)			◆	◆			◆	◆				◆						
	RCMT 1003M0-ST	2,50 (1,00–4,00)	0,25 (0,12–1,00)			◆	◆			◆	◆				◆						
	RCMT 10T3M0-ST	2,50 (1,00–4,00)	0,25 (0,16–1,40)			◆	◆			◆	◆				◆						
	RCMT 1204M0-ST	3,00 (1,20–4,80)	0,30 (0,20–1,80)			◆	◆			◆	◆				◆						
	RCMT 1606M0-ST	3,50 (1,60–6,40)	0,37 (0,25–2,30)			◆	◆			◆	◆				◆						
	RCMT 2006M0-ST	4,00 (2,00–8,00)	0,45 (0,30–3,00)			◆	◆			◆	◆				◆	◆					
 <p>Roughing to Medium</p>	RCMT 2507M0-RF	6,30 (2,50–10,00)	0,79 (0,25–2,50)	◆	◆					○	○				○						
 <p>Roughing to Medium</p>	RCMT 2006M0-RM	4,00 (2,00–8,00)	0,45 (0,13–0,63)	◆	◆					○	○				○						
 <p>Roughing to Medium</p>	RCMX 1003M0-ST	2,50 (1,00–4,00)	0,32 (0,10–1,00)			○	◆	○							○						
	RCMX 1204M0-ST	3,00 (1,20–4,80)	0,38 (0,12–1,20)			○	◆	○							○						
	RCMX 1606M0-ST	4,00 (1,60–6,40)	0,41 (0,16–1,60)			○	◆	○							○						
	RCMX 2006M0-ST	5,00 (2,00–8,00)	0,63 (0,20–2,00)			○	◆	○							○						
	RCMX 2507M0-ST	6,30 (2,50–10,00)	0,79 (0,25–2,50)			◆	◆	○							○						
	RCMX 3209M0-ST	8,00 (3,20–12,80)	1,01 (0,32–3,20)			◆	◆	○							○						
 <p>Roughing to Medium</p>	RCMX 3209M0-RM	6,50 (3,20–13,00)	1,80 (0,80–2,50)			◆	◆	○		◆	◆	○			○	○					
 <p>Roughing to Medium</p>	RCMX 2507M0-RR	5,00 (3,20–8,00)	1,80 (0,80–2,50)			◆	◆	○		◆	◆	○									
	RCMX 3209M0-RR	6,50 (3,20–13,00)	1,80 (0,80–2,50)			◆	◆	○		◆	◆	○			○						
 <p>Finishing to Fine Finishing</p>	RCGT 0602M0-LN	1,25 (0,50–2,00)	0,13 (0,05–0,20)																◆		
	RCGT 0803M0-LN	1,50 (0,50–2,50)	0,15 (0,05–0,25)																◆		
	RCGT 1003M0-LN	2,00 (1,00–3,00)	0,20 (0,10–0,30)																◆		
	RCGT 1204M0-LN	2,25 (1,00–3,50)	0,23 (0,10–0,35)																◆		


◆ First choice ◆ Stock Items ○ Available under request

SC — square 90° positive




Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S				
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20		
SCMW  Finishing	SCMW 060202	1,50 (0,05–3,00)	0,10 (0,04–0,13)																		○			
	SCMW 060204	1,50 (0,05–3,00)	0,20 (0,08–0,26)																			○		
	SCMW 070202	1,80 (0,05–3,50)	0,10 (0,04–0,13)																			○		
	SCMW 070302	1,80 (0,05–3,50)	0,10 (0,04–0,13)																			○		
	SCMW 090304	2,00 (0,05–4,00)	0,20 (0,08–0,26)																			○		
	SCMW 09T302	2,40 (0,05–4,70)	0,10 (0,04–0,13)																			○		
	SCMW 09T304	2,40 (0,05–4,70)	0,20 (0,08–0,26)																			⊙		
	SCMW 09T308	2,40 (0,05–4,70)	0,40 (0,16–0,23)																			⊙		
	SCMW 120404	3,20 (0,05–6,30)	0,20 (0,08–0,26)																			○		
	SCMW 120408	3,20 (0,05–6,30)	0,40 (0,16–0,53)																			⊙		
	SCMW 120412	3,20 (0,05–6,30)	0,60 (0,24–0,80)																			○		
SCMT-FP  Fine Finishing	SCMT 09T304-FP	0,35 (0,11–2,00)	0,11 (0,06–0,23)			⊙	⊙																	
	SCMT 09T308-FP	0,35 (0,15–2,00)	0,15 (0,08–0,30)			⊙	⊙																	
SCMT-FM  Fine Finishing	SCMT 09T304-FM	0,35 (0,11–2,00)	0,11 (0,06–0,23)							⊙													⊙	
	SCMT 09T308-FM	0,35 (0,15–2,00)	0,15 (0,08–0,30)							⊙													⊙	
SCMT-FK  Finishing	SCMT 09T304-FK	0,35 (0,11–2,00)	0,11 (0,06–0,23)																		⊙			
	SCMT 09T308-FK	0,35 (0,15–2,00)	0,15 (0,08–0,30)																		⊙			
SCMT-MP  Finishing	SCMT 09T304-MP	0,80 (0,25–3,00)	0,15 (0,08–0,23)			⊙	⊙																	
	SCMT 09T308-MP	0,80 (0,50–3,00)	0,25 (0,10–0,40)			⊙	⊙																	
	SCMT 120404-MP	0,96 (0,30–3,60)	0,18 (0,09–0,27)			⊙	⊙																	
	SCMT 120408-MP	0,96 (0,60–3,60)	0,25 (0,12–0,45)			⊙	⊙																	
	SCMT 120412-MP	0,96 (0,72–3,60)	0,35 (0,14–0,60)			⊙	⊙																	
SCMT-MM  Finishing	SCMT 09T304-MM	0,80 (0,25–3,00)	0,15 (0,08–0,23)							⊙													⊙	
	SCMT 09T308-MM	0,80 (0,50–3,00)	0,25 (0,10–0,40)							⊙													⊙	
	SCMT 120404-MM	0,96 (0,30–3,60)	0,18 (0,09–0,27)							⊙													⊙	
	SCMT 120408-MM	0,96 (0,60–3,60)	0,25 (0,12–0,45)							⊙													⊙	
	SCMT 120412-MM	0,96 (0,72–3,60)	0,35 (0,14–0,60)							⊙													⊙	
SCMT-MK  Finishing	SCMT 09T304-MK	0,80 (0,25–3,00)	0,15 (0,08–0,23)																		⊙	⊙		
	SCMT 09T308-MK	0,80 (0,50–3,00)	0,25 (0,10–0,40)																		⊙	⊙		
	SCMT 120408-MK	0,96 (0,60–3,60)	0,25 (0,12–0,45)																		⊙	⊙	⊙	

⊙ First choice ⊙ Stock Items ○ Available under request

SC — square 90° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S			
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20	
SCGT-LN  Finishing to fine Finishing	SCGT 09T304-LN	2,05 (0,10–4,00)	0,16 (0,10–0,26)																				
	SCGT 09T308-LN	2,55 (0,10–5,00)	0,22 (0,15–0,40)																				
	SCGT 120404-LN	2,55 (0,10–5,00)	0,20 (0,10–0,26)																				
	SCGT 120408-LN	2,55 (0,10–5,00)	0,30 (0,15–0,50)																				

SP — square 90° positive




Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S			
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR20	FSV40	ZN10	SVN10	SVN20	
SPUN  Medium to Finishing	SPUN 090304	2,00 (1,00–3,00)	0,15 (0,08–0,20)				○																
	SPUN 090308	2,00 (1,00–3,00)	0,22 (0,13–0,35)				○																
	SPUN 120304	3,00 (1,00–5,00)	0,20 (0,10–0,30)				⊕																
	SPUN 120308	3,00 (1,00–5,00)	0,25 (0,15–0,40)				⊕																
	SPUN 120312	3,00 (1,00–5,00)	0,35 (0,20–0,50)				⊕																
	SPUN 120316	3,00 (1,00–5,00)	0,45 (0,25–0,80)				○																
	SPUN 120408	3,00 (1,00–5,00)	0,25 (0,15–0,40)				○																
	SPUN 120412	3,00 (1,00–5,00)	0,35 (0,20–0,50)				○																
	SPUN 120416	3,00 (1,00–5,00)	0,45 (0,25–0,80)				○																
	SPUN 150408	3,00 (1,00–5,00)	0,27 (0,15–0,40)				○																
	SPUN 150412	3,00 (1,00–5,00)	0,35 (0,20–0,50)				○																
	SPUN 190408	4,00 (1,50–7,00)	0,25 (0,15–0,40)				○																
	SPUN 190412	4,00 (1,50–7,00)	0,35 (0,20–0,50)				○																
	SPUN 190416	4,50 (2,00–7,00)	0,45 (0,25–0,80)				○																
	SPUN 250620	6,00 (3,00–10,00)	0,55 (0,30–1,00)				○																
SPMR-12  Finishing to Fine Finishing	SPMR 090308-12	1,00 (0,30–2,00)	0,20 (0,10–0,30)				⊕ ⊕																
	SPMR 120304-12	1,30 (0,50–2,00)	0,15 (0,08–0,25)				⊕ ⊕																
	SPMR 120308-12	1,30 (0,50–2,00)	0,22 (0,10–0,30)				⊕ ⊕																
SPMR-13  Finishing	SPMR 090304-13	2,20 (1,00–3,50)	0,10 (0,05–0,20)				⊕ ⊕																
	SPMR 090308-13	2,20 (1,00–3,50)	0,25 (0,10–0,40)				⊕ ⊕																
	SPMR 120304-13	2,60 (1,50–4,00)	0,10 (0,07–0,20)				⊕ ⊕																
	SPMR 120308-13	2,60 (1,50–4,00)	0,30 (0,20–0,40)				⊕ ⊕																
	SPMR 120312-13	2,60 (1,50–4,00)	0,40 (0,25–0,55)				⊕ ⊕																

⊕ First choice

⊕ Stock Items




○ Available under request

TC – triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
 Finishing	TCMW 06T102	0,90 (0,05–1,90)	0,10 (0,04–0,13)																			
	TCMW 080202	1,00 (0,05–2,00)	0,10 (0,04–0,13)																			
	TCMW 090202	1,30 (0,05–2,70)	0,10 (0,04–0,13)																			
	TCMW 090204	1,30 (0,05–2,70)	0,20 (0,08–0,26)																			
	TCMW 110202	1,50 (0,05–3,10)	0,10 (0,04–0,13)																			
	TCMW 110204	1,50 (0,05–3,10)	0,20 (0,08–0,26)												⊕							
	TCMW 110208	1,50 (0,05–3,10)	0,40 (0,16–0,53)																			
	TCMW 160308	2,00 (0,05–4,40)	0,40 (0,16–0,53)																			
	TCMW 16T304	2,30 (0,05–4,70)	0,20 (0,08–0,26)													⊕						
	TCMW 16T308	2,30 (0,05–4,70)	0,40 (0,16–0,53)													⊕						
TCMW 220408	3,10 (0,05–6,30)	0,40 (0,16–0,53)																				
 Fine Finishing	TCMT 06T102-FP	0,26 (0,06–1,50)	0,06 (0,03–0,11)			⊕																
	TCMT 06T104-FP	0,26 (0,08–1,50)	0,08 (0,05–0,17)			⊕	⊕															
	TCMT 06T108-FP	0,26 (0,11–1,50)	0,11 (0,06–0,23)			⊕	⊕															
	TCMT 090202-FP	0,30 (0,06–1,70)	0,06 (0,03–0,13)			⊕																
	TCMT 090204-FP	0,30 (0,10–1,70)	0,10 (0,05–0,19)			⊕	⊕															
	TCMT 110202-FP	0,30 (0,06–1,70)	0,06 (0,03–0,13)			⊕																
	TCMT 110204-FP	0,30 (0,10–1,70)	0,10 (0,05–0,19)			⊕	⊕															
	TCMT 110208-FP	0,30 (0,13–1,70)	0,13 (0,07–0,26)			⊕	⊕															
	TCMT 110302-FP	0,30 (0,06–1,70)	0,06 (0,03–0,13)			⊕																
	TCMT 110304-FP	0,30 (0,10–1,70)	0,10 (0,05–0,19)			⊕	⊕															
TCMT 110308-FP	0,30 (0,13–1,70)	0,13 (0,07–0,26)			⊕	⊕																
TCMT 16T304-FP	0,35 (0,11–2,00)	0,11 (0,06–0,23)			⊕	⊕																
 Fine Finishing	TCMT 06T102-FM	0,26 (0,06–1,50)	0,06 (0,03–0,11)							⊕		⊕									⊕	
	TCMT 06T104-FM	0,26 (0,08–1,50)	0,08 (0,05–0,17)							⊕		⊕										⊕
	TCMT 06T108-FM	0,26 (0,11–1,50)	0,11 (0,06–0,23)							⊕		⊕										⊕
	TCMT 090202-FM	0,30 (0,06–1,70)	0,06 (0,03–0,13)							⊕		⊕										⊕
	TCMT 090204-FM	0,30 (0,10–1,70)	0,10 (0,05–0,19)							⊕		⊕										⊕
	TCMT 110202-FM	0,30 (0,06–1,70)	0,06 (0,03–0,13)							⊕		⊕										⊕
	TCMT 110204-FM	0,30 (0,10–1,70)	0,10 (0,05–0,19)							⊕		⊕										⊕
	TCMT 110208-FM	0,30 (0,13–1,70)	0,13 (0,07–0,26)							⊕		⊕										⊕
	TCMT 110302-FM	0,30 (0,06–1,70)	0,06 (0,03–0,13)							⊕		⊕										⊕
	TCMT 110304-FM	0,30 (0,10–1,70)	0,10 (0,05–0,19)							⊕		⊕										⊕
TCMT 110308-FM	0,30 (0,13–1,70)	0,13 (0,07–0,26)							⊕		⊕										⊕	
TCMT 16T304-FM	0,35 (0,11–2,00)	0,11 (0,06–0,23)							⊕		⊕										⊕	





- ⊕ First choice
- ⊖ Stock Items
- Available under request

TC – triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
TCMT-FK  Fine Finishing	TCMT 06T102-FK	0,26 (0,06–1,50)	0,06 (0,03–0,11)																			
	TCMT 06T104-FK	0,26 (0,08–1,50)	0,08 (0,05–0,17)																			
	TCMT 06T108-FK	0,26 (0,11–1,50)	0,11 (0,06–0,23)																			
	TCMT 090202-FK	0,30 (0,06–1,70)	0,06 (0,03–0,13)																			
	TCMT 090204-FK	0,30 (0,10–1,70)	0,10 (0,05–0,19)																			
	TCMT 110202-FK	0,30 (0,06–1,70)	0,06 (0,03–0,13)																			
	TCMT 110204-FK	0,30 (0,10–1,70)	0,10 (0,05–0,19)																			
	TCMT 110302-FK	0,30 (0,06–1,70)	0,06 (0,03–0,13)																			
	TCMT 110304-FK	0,30 (0,10–1,70)	0,10 (0,05–0,19)																			
TCMT 16T304-FK	0,35 (0,11–2,00)	0,11 (0,06–0,23)																				
TCMT-FW  Fine Finishing Wiper	TCMT 090204-FW	0,70 (0,30–2,00)	0,12 (0,05–0,30)			⊕							⊕		⊕						⊕	
	TCMT 090208-FW	0,70 (0,30–2,00)	0,25 (0,10–0,35)			⊕							⊕		⊕							⊕
	TCMT 110204-FW	1,00 (0,30–2,50)	0,20 (0,07–0,30)			⊕							⊕		⊕							⊕
	TCMT 110208-FW	1,00 (0,30–2,50)	0,25 (0,12–0,40)			⊕							⊕		⊕							⊕
	TCMT 110304-FW	1,00 (0,30–2,50)	0,20 (0,07–0,30)			⊕							⊕		⊕							⊕
	TCMT 110308-FW	1,00 (0,30–2,50)	0,25 (0,12–0,40)			⊕							⊕		⊕							⊕
	TCMT 16T304-FW	1,20 (0,30–2,50)	0,20 (0,07–0,35)			⊕							⊕		⊕							⊕
TCMT 16T308-FW	1,20 (0,30–2,50)	0,25 (0,12–0,50)			⊕							⊕		⊕							⊕	
TCMT-MP  Finishing	TCMT 090204-MP	0,60 (0,19–2,25)	0,11 (0,06–0,17)			⊕	⊕		○	○												
	TCMT 090208-MP	0,60 (0,38–2,25)	0,15 (0,08–0,23)			⊕	⊕		○	○												
	TCMT 110204-MP	0,67 (0,21–2,50)	0,13 (0,06–0,19)			⊕	⊕		○	⊕												
	TCMT 110208-MP	0,67 (0,42–2,50)	0,17 (0,09–0,26)			⊕	⊕		○	○												
	TCMT 110212-MP	0,67 (0,50–2,50)	0,20 (0,10–0,40)			⊕	⊕		○	○												
	TCMT 110304-MP	0,67 (0,21–2,50)	0,13 (0,06–0,19)			⊕	⊕		○	○												
	TCMT 110308-MP	0,67 (0,42–2,50)	0,20 (0,09–0,40)			⊕	⊕		○	○												
	TCMT 110312-MP	0,67 (0,50–2,50)	0,30 (0,10–0,50)			⊕	⊕		○	○												
	TCMT 16T304-MP	0,80 (0,25–3,00)	0,15 (0,08–0,25)			⊕	⊕		○	○												
	TCMT 16T308-MP	0,80 (0,50–3,00)	0,22 (0,10–0,45)			⊕	⊕		○	⊕												
	TCMT 16T312-MP	0,80 (0,60–3,00)	0,35 (0,12–0,60)			⊕	⊕		○	○												
	TCMT 220408-MP	0,96 (0,60–3,60)	0,25 (0,12–0,45)			⊕	⊕		○	○												


- ⊕ First choice
- ⊕ Stock Items
- Available under request

TC – triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K				N		S			
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR 20	FSV40	ZN10	SVN10	SVN20		
 Finishing	TCMT 090204-MM	0,60 (0,19–2,25)	0,11 (0,06–0,17)								⊕		⊕								⊕			
	TCMT 090208-MM	0,60 (0,38–2,25)	0,15 (0,08–0,23)								⊕		⊕									⊕		
	TCMT 110204-MM	0,67 (0,21–2,50)	0,13 (0,06–0,19)								⊕		⊕	⊕							⊕	⊕		
	TCMT 110208-MM	0,67 (0,42–2,50)	0,17 (0,09–0,26)								⊕		⊕									⊕		
	TCMT 110304-MM	0,67 (0,21–2,50)	0,13 (0,06–0,19)								⊕		⊕									⊕		
	TCMT 110308-MM	0,67 (0,42–2,50)	0,20 (0,09–0,40)								⊕		⊕									⊕		
	TCMT 16T304-MM	0,80 (0,25–3,00)	0,15 (0,08–0,23)								⊕		⊕									⊕		
	TCMT 16T308-MM	0,80 (0,50–3,00)	0,22 (0,10–0,45)								⊕		⊕	⊕							⊕	⊕		
	TCMT 16T312-MM	0,80 (0,60–3,00)	0,35 (0,12–0,60)								⊕		⊕									⊕		
	TCMT 220408-MM	0,96 (0,60–3,60)	0,25 (0,12–0,45)								⊕		⊕									⊕		
 Finishing	TCMT 090204-MK	0,60 (0,19–2,25)	0,11 (0,06–0,17)												⊕	⊕								
	TCMT 090208-MK	0,60 (0,38–2,25)	0,15 (0,08–0,23)												⊕	⊕	⊕							
	TCMT 110204-MK	0,67 (0,21–2,50)	0,13 (0,06–0,19)													⊕	⊕							
	TCMT 110208-MK	0,67 (0,42–2,50)	0,17 (0,09–0,26)													⊕	⊕							
	TCMT 110304-MK	0,67 (0,21–2,50)	0,13 (0,06–0,19)														⊕	⊕						
	TCMT 110308-MK	0,67 (0,42–2,50)	0,20 (0,09–0,40)														⊕	⊕						
	TCMT 16T304-MK	0,80 (0,25–3,00)	0,15 (0,08–0,23)														⊕	⊕						
	TCMT 16T308-MK	0,80 (0,50–3,00)	0,22 (0,10–0,45)															⊕	⊕					
	TCMT 16T312-MK	0,80 (0,60–3,00)	0,35 (0,12–0,60)															⊕	⊕					
	TCMT 220408-MK	0,96 (0,60–3,60)	0,25 (0,12–0,45)															⊕	⊕					
 Finishing Wiper	TCMT 110208-MW	1,20 (0,50–3,00)	0,30 (0,15–0,50)			⊕					⊕		⊕		○	⊕					⊕			
	TCMT 110308-MW	1,20 (0,50–3,00)	0,30 (0,15–0,50)			⊕					⊕		⊕		○	⊕					⊕			
	TCMT 16T308-MW	1,50 (0,50–4,00)	0,30 (0,15–0,50)			⊕					⊕		⊕		○	⊕					⊕			
 Finishing to Fine Finishing	TCGT 090202-FS	0,50 (0,10–1,50)	0,07 (0,02–0,12)										⊕	⊕							⊕	⊕		
	TCGT 090204-FS	1,00 (0,50–2,00)	0,15 (0,08–0,25)											⊕	⊕							⊕	⊕	
	TCGT 110201-FS	0,30 (0,10–1,00)	0,03 (0,01–0,08)														⊕	⊕				⊕	⊕	
	TCGT 110202-FS	0,50 (0,10–1,50)	0,07 (0,02–0,12)														⊕	⊕				⊕	⊕	
	TCGT 110204-FS	1,30 (0,30–2,50)	0,15 (0,08–0,25)															⊕	⊕				⊕	⊕
	TCGT 110301-FS	0,30 (0,10–1,00)	0,03 (0,01–0,08)															⊕	⊕				⊕	⊕
	TCGT 110302-FS	0,50 (0,10–1,50)	0,07 (0,02–0,12)															⊕	⊕				⊕	⊕
	TCGT 110304-FS	1,30 (0,50–2,50)	0,15 (0,08–0,25)																⊕	⊕				⊕



- ⊕ First choice
- ⊗ Stock Items
- Available under request

TC — triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
TCGT-LN  Finishing to Fine Finishing	TCGT 090202-LN	1,00 (0,05–2,50)	0,10 (0,07–0,15)																⊕			
	TCGT 090204-LN	1,00 (0,05–2,50)	0,15 (0,10–0,20)																	⊕		
	TCGT 110202-LN	2,03 (0,05–4,00)	0,12 (0,07–0,15)																	⊕		
	TCGT 110204-LN	2,05 (0,10–4,00)	0,15 (0,10–0,20)																	⊕		
	TCGT 110208-LN	2,05 (0,10–4,00)	0,25 (0,15–0,50)																	⊕		
	TCGT 16T302-LN	2,53 (0,05–5,00)	0,10 (0,07–0,15)																	⊕		
	TCGT 16T304-LN	2,80 (0,10–5,50)	0,15 (0,10–0,20)																	⊕		
	TCGT 16T308-LN	2,80 (0,10–5,50)	0,25 (0,15–0,50)																	⊕		
	TCGT 16T312-LN	3,00 (0,15–5,50)	0,45 (0,15–0,70)																	⊕		
	TCGT 16T316-LN	3,00 (0,15–5,50)	0,65 (0,20–0,90)																	⊕		


- ⊕ First choice
- ⊖ Stock Items
- Available under request

TC — triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K			N		S		
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR 20	FSV40	ZN10	SVN10	SVN20
 <p>TPUN Medium to Finishing</p>	TPUN 110204	2,00 (1,00–3,00)	0,15 (0,10–0,30)				○															
	TPUN 110208	2,00 (1,00–3,00)	0,30 (0,15–0,40)				○															
	TPUN 110302	2,00 (1,00–3,00)	0,10 (0,05–0,13)				○															
	TPUN 110304	2,00 (1,00–3,00)	0,15 (0,10–0,30)				○															
	TPUN 110308	2,00 (1,00–3,00)	0,30 (0,15–0,40)				○															
	TPUN 110312	2,00 (1,00–3,00)	0,35 (0,20–0,05)				○															
	TPUN 160304	3,50 (1,00–5,00)	0,15 (0,10–0,30)				⊕	⊕		⊕												
	TPUN 160308	3,50 (1,00–5,00)	0,30 (0,15–0,40)				⊕	⊕		⊕												
	TPUN 160312	3,50 (1,50–5,00)	0,35 (0,20–0,50)				⊕	⊕														
	TPUN 160316	3,50 (1,50–5,00)	0,50 (0,25–0,70)				○															
	TPUN 160326	3,50 (1,50–5,00)	0,80 (0,25–1,40)				○															
	TPUN 160408	3,50 (1,00–5,00)	0,30 (0,15–0,40)				○															
	TPUN 160412	3,50 (1,50–5,00)	0,35 (0,20–0,50)				○															
	TPUN 220404	4,50 (1,50–7,00)	0,15 (0,10–0,30)				⊕	⊕		○												
	TPUN 220408	4,50 (1,50–7,00)	0,30 (0,15–0,40)				⊕	⊕		○												
	TPUN 220412	4,50 (1,50–7,00)	0,35 (0,20–0,50)				⊕	⊕														
	TPUN 220416	4,50 (1,50–7,00)	0,50 (0,25–0,70)				○															
	TPUN 220420	4,50 (1,50–7,00)	0,60 (0,30–1,00)				○															
	TPUN 220440	4,50 (1,50–7,00)	1,20 (0,40–2,20)				○															
	TPUN 270616	5,50 (2,00–8,00)	0,50 (0,25–0,70)							○												
TPUN 270620	5,50 (2,00–8,00)	0,60 (0,30–1,00)							○													
TPUN 330620	6,50 (3,00–10,00)	0,60 (0,30–1,00)					⊕	○														
 <p>TPMR-12 Finishing to Fine Finishing</p>	TPMR 090204-12	0,60 (0,10–1,00)	0,10 (0,05–0,15)			○	○															
	TPMR 090304-12	0,60 (0,10–1,00)	0,10 (0,05–0,15)			○	○															
	TPMR 110302-12	0,90 (0,10–1,50)	0,07 (0,03–0,10)			○	○															
	TPMR 110304-12	0,90 (0,30–1,50)	0,10 (0,05–0,20)				⊕	⊕														
	TPMR 110308-12	0,90 (0,30–1,50)	0,20 (0,05–0,35)				⊕	⊕														
	TPMR 160304-12	1,30 (0,50–2,00)	0,12 (0,08–0,20)				⊕	⊕														
	TPMR 160308-12	1,50 (0,50–3,00)	0,22 (0,08–0,35)				⊕	⊕														
	TPMR 160312-12	1,50 (0,50–3,00)	0,35 (0,08–0,55)				○	○														

- ⊕ First choice
- ⊗ Stock Items
- Available under request

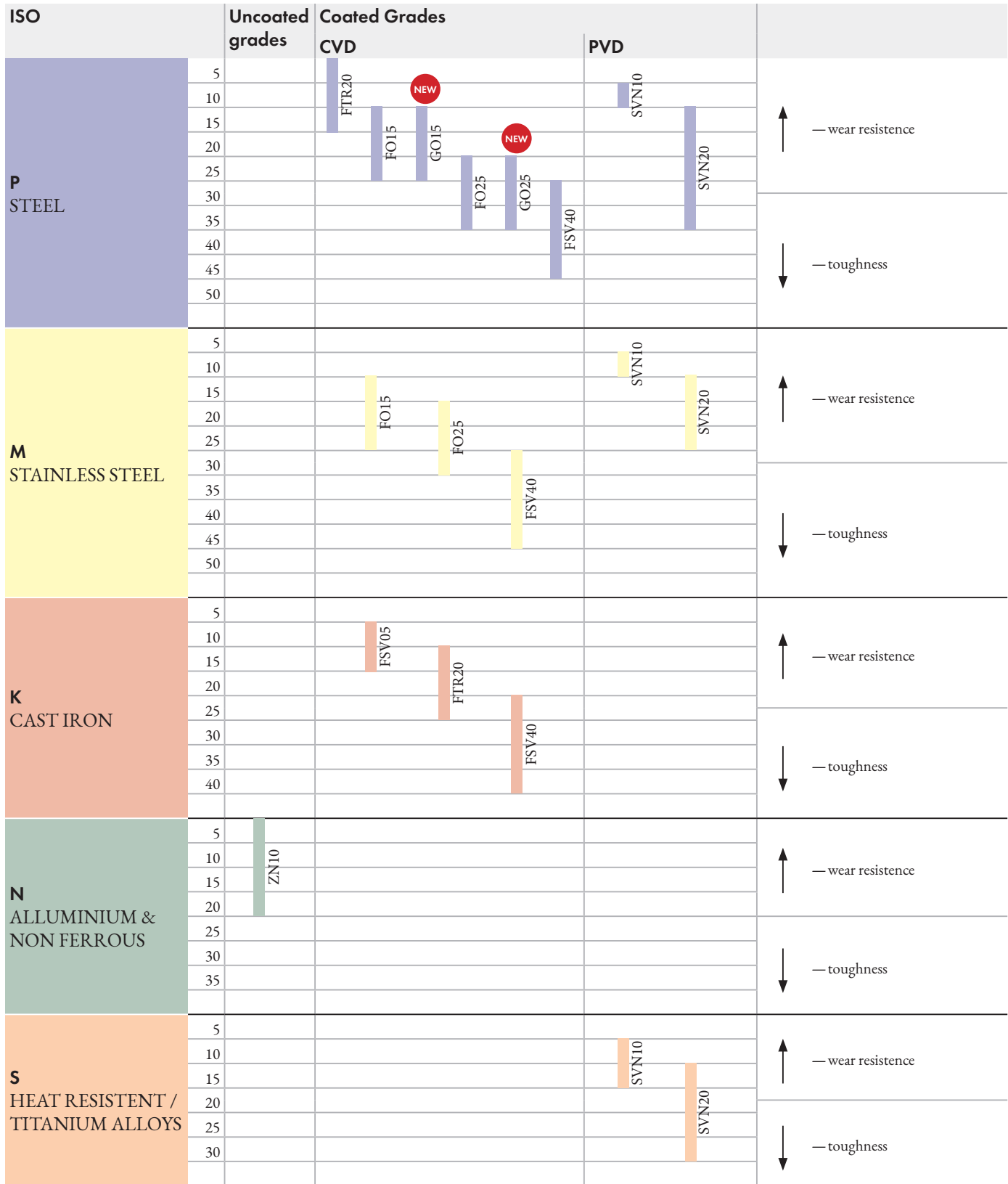
TC — triangular 60° positive

Inserts	ISO Reference	ap (mm)	fn (mm)	P						M					K				N		S	
				GO15	GO25	FO15	FO25	FSV40	SVN10	SVN20	FO15	FO25	FSV40	SVN10	SVN20	ZSV05	FSV05	FTR.20	FSV40	ZN10	SVN10	SVN20
TPMR-13  Finishing	TPMR 090202-13	0,80 (0,20–1,50)	0,05 (0,03–0,10)			○	○															
	TPMR 090204-13	1,00 (0,20–1,50)	0,10 (0,08–0,20)			⊕	⊕															
	TPMR 090208-13	1,00 (0,20–1,50)	0,25 (0,13–0,40)			○	○															
	TPMR 090304-13	1,00 (0,20–1,50)	0,10 (0,08–0,20)			○	○															
	TPMR 110302-13	1,50 (0,20–2,00)	0,05 (0,03–0,10)			○	○															
	TPMR 110304-13	2,00 (1,00–3,00)	0,12 (0,10–0,20)			⊕	⊕															
	TPMR 110308-13	2,00 (1,00–3,00)	0,25 (0,13–0,40)			⊕	⊕															
	TPMR 160304-13	3,00 (1,00–5,00)	0,15 (0,10–0,20)			⊕	⊕															
	TPMR 160308-13	3,00 (1,00–5,00)	0,30 (0,13–0,40)			⊕	⊕															
	TPMR 160312-13	3,00 (1,00–5,00)	0,40 (0,15–0,55)			⊕	⊕															
	TPMR 220408-13	5,00 (1,50–7,00)	0,30 (0,15–0,40)			⊕	⊕															

- ⊕ First choice
- ⊖ Stock Items
- Available under request

Turning grades

Turning grades



Position and grade symbols shape indicate the suitable field of application.

Turning grades description

PVD GRADES	ISO	Turning grades description
SVN10	P05-P10 M05-M10 S05-S15	PVD (AlTiN) coated carbide grade with a very hard micro grain substrate improves wear resistance, heat dissipation and avoid built-up edge. High performance on “gummy” materials. For light turning of steels, hardened steels, stainless steels and HRSA.
SVN20	P10-P35 M10-M25 S10-S30	A micro grain size combined with the AlTiN PVD coating make it suitable for Roughing to Finishing operations under good cutting conditions to light interrupted cuts at medium cutting speeds. Suitable for steels, stainless steel, HRSA.

CVD GRADES	ISO	Turning grades description
GO15	P10-P25	New medium temperature CVD coating with α -Al ₂ O ₃ +TiN. Carbide grade with a gradient layer close to the surface. Suitable for high to medium cutting speeds on steels.
GO25	P20-P35	Carbide grade suitable for medium machining of steels & cast steels at medium cutting speeds. The substrate is suitable for the adhesion of the Alumina coating (α -Al ₂ O ₃ +TiN) medium temperature - CVD, improving the tool life.
FO15	P10-P25 M10-M25	Medium temperature CVD coating with α -Al ₂ O ₃ . Carbide grade with a gradient layer close to the surface. Suitable for high to medium cutting speeds on steels & cast steels.
FO25	P20-P35 M15-M30	Carbide grade suitable for medium machining of steels & cast steels at medium cutting speeds. The substrate is suitable for the adhesion of the Alumina coating (α -Al ₂ O ₃) medium temperature - CVD, improving the tool life.
FSV40	P25-P45 M25-M45 S20-S40	Substrate grade binary (Wc & Co) with medium grain size combined with the medium temperature CVD coating. Suitable for heavy roughing to roughing operations with interrupted cuts at medium to low cutting speeds.
FSV05	K05-K15	The substrate grade with a very good wear resistance combined with the MT-CVD coating allow to work at high to medium cutting speeds at stable conditions. Recommend for turning of grey cast irons (GCI) or hardened steels. Can also be a solution for high alloy steels.
FTR20	P01-P15 K05-K15	Medium temperature CVD coating (α -Al ₂ O ₃) combined with a hard substrate make it capable of withstanding interrupted conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds. Can also be a solution for high alloy steels.

UNCOATED CARBIDE GRADE	ISO	Turning grades description
ZN10	N01-N20	Uncoated carbide micrograin grade combining a good abrasive wear resistance and toughness. Suitable for rough to finish turning of HRSA, Titanium alloys, cast irons and Aluminium alloys.

PVD Coated Grades

ISO	Melcor	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Material													
P	P01	SVN10								PR915 PR1005	PV3030	PC8110	
	P10	SVN10	GC1525 GC1025	KC5010 KC5510 KU10T	IC250 IC350 IC507 IC570 IC807 IC907 IC908	CP200 TS2001	VP10MF		AH710	PR915 PR1005 PR930 PR1025 PR1115 PR1225 PR1425	PV3010 PV3030 TT7080 TT1040	PC230	
	P20	SVN20	GC1525 GC1025 GC1125	KC5025 KC5525 KC7215 KC7315 KU25T	IC228 IC250 IC308 IC328 IC350 IC354 IC507 IC528 IC570 IC807 IC808 IC907 IC908 IC928 IC1008 IC1028 IC3028	CP250 TS2500	VP10RT VP20RT VP15TF VP20MF	AC520U	AH710 AH725 AH120 SH730 GH730 GH130	PR930 PR1025 PR1115 PR1225	TT7220 TT9020 TT7080 TT9080 TT7070	PC5300 PC8115	SR226 GM127
M	P30	SVN20	GC1025 GC1125	KC7015 KC7020 KU25T KC7235	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028	CP500	VP10RT VP20RT VP20MF	AC530U	AH725 AH120 SH730 GH730 GH130 AH740 J740		TT9030 TT7030 TT7080 TT9030 TT9080	PC8115	GM40 CTP1235 CTP2235 SR226 GM127
	P40	SVSV40		KC7040 KV7140 KV7030	IC228 IC328 IC330 IC528 IC1008 IC1028 IC3028	CP500		AC530U	AH740 J740		TT7080 TT8030 TT7070	PC3545	CTP2440 GM40 CTP1235 CTP2235

P – steel

M – stainless steel

SVN10 = Best available choice

PVD Coated Grades

ISO	Melcor	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit	
Material														
K	K10		KC5010 KC7210	IC350 IC1008	CP200 TS2000		AC510U			PR905	PV3010 PV3030	PC5300	SR216 SR226	
	K20		KC7015 KC7215 KC7315	IC228 IC350 IC808 IC908 IC1008	CP200 CP250 TS2000 TS2500	VP10RT VP20RT VP15TF				PR905	TT6060 TT8020 TT8030	PC5300	CTP2120 CTP2440 SR216 SR226	
	K30		KC7225	IC228 IC350 IC808 IC908 IC1008	CP500	VP10RT VP20RT VP15TF					TT9030 TT6290 TT9030 TT8030		CTP2440	
S	S01	SVN10		IC507 IC907		MP9005 VP05RT		AH905 AH905 SH730	WDSM10	PR915		PC8110		
	S10	SVN10	GC1105 GC1005 GC1025	KC5010 KC5410 KC5510	IC507 IC903 IC300 IC808	CP200 CP250 TS2000 TS2500 CP250	MP9015 VP10RT MP9015	AC510U	AH110 AH120	WSM20	PR915	TT5030 TT5030	PC8110 PC8115 PC8105	CM40 SR226 CM45
	S20	SVN20	GC1025 GC1125	KC5025 KC5525	IC908 IC928 IC3028 IC806	TS2500 CP500	MT9015 VP20RT	AC510U AC520U	AH120 AH720	WSM30	PR1125	TT8020 TT8030	PC8815 PC5300	CTP2440 GM127
	S30	SVN20	GC1125				VP15TF	AC520U	AH725		PR1125	TT8020	PC5400	CTP2135

K – cast iron

S – heat resistant / titanium alloys

Uncoated Grades

ISO	Melcor	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Material													
N	N01	ZN10	H10	IC20				KS05F	WK1	KW10	K10		
	N10		H10 H13A	KU10 K313 K68	IC20 IC08 IC28	890 HX KX	HTi10	TH10	WK1	KW10 KWK15	K10	H01	
	N20		H10 H13A	KU10 K313 K68	IC08 IC28	HX KX 883	H1	KS15F	WK1	KW10 KWK15		H01	
	N30			IC28									

N – aluminium

CVD Coated Grades

ISO Material	Melcor	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit	
P	P01	FTR20	GC4205 GC4005	KCP05 KCP105	IC9150 IC8150 IC428	TP0500 TP1500	UE6105	AC810P AC700G	T9105 T9005	WPP01	CA510 CA5505	TT1300	NC3010	
	P10	FTR20 FO15 GO15	GC4315 GC4215 GC4015 GC4325	KCP10B KCP10 KCP25 KCP110	IC9150 IC9015 IC8150 IC8250	TP1500 TP2500	UE6105	AC810P AC700G AC820P AC2000	T9105 T9005 T9115	WPP01 WPP05	CA5510 CA5505 CA515 CA5515	TT1300 TT7310 TT7400	NC3215	CTC1110 CTC1115 CTC3110 TCC410
	P20	FO15 GO15 FO25 GO25	GC4315 GC4215 GC4015 GC4325 GC4225 GC4025	KCP25B KCP25 KCP125	IC9015 IC8250 IC9050 IC9250 IC8350	TP2500	MC6015 UE6110 MC6025 UE6020 MY5015	AC820P AC2000 AC830P	T9115 T9125	WPP10S WPP20S	CA515 CA5515 CA525 CA5525 CR9025	TT3500 TT5100 TT7400 KT7300 TT7800	NC3220 NC3220 NC3120	CTC1110 CTC1115 CTC1125 CTC1130 CTC1425
	P30	FO25 GO25	GC4325 GC4225 GC4025 GC4235 GC4035	KCP30 KCP40 KCP8050	IC8350 IC9250 IC9350	TP3500 TP3000	MC025 UE6020 UE6035 UH6400	AC830P AC630M	T9125 T9135 T9035	WPP30S	CA525 CA5525 CA530 CA5335 CR9025	TT3500 TT5100 TT7400 KT7300	NC3215 NC3225 NC3120	CTC1125 CTC1130 CTC1135 CTC1425
	P40	FSV40	GC4235 GC4035	KCP30 KCP40 KC9140 KC9040 KC9240 KC9245	IC9350	TP3500 TP3000	UE6035 UH6400	AC630M	T9135 T9035		CA530 CA5535	TT5100 TT7100 KT7300 TT7800	NC500H NC5330	CTC1135 CTC1435 CTC2135
	M	M10	FO15	GC2015	KCM15	IC9250 IC6015 IC8250	TM2000	MC7015 US7020	AC610M	T9115	WAM20	CA6515		NC9020
	M20	FO15 FO25	GC2015	KCM15 KC9225	IC9250 IC6015 IC9025 IC656	TM2000	MC7015 US7020 MC7025	AC610M AC6030M AC630M	T6020 T9125		CA6515 CA6525	TT5100	NC9020	CTC1115 CTC1125 CTC1130 CTC1135
	M30	FO25 FSV40	GC2025	KCM25 KC9230	IC9350 IC6025 IC635	TM4000	MC7025 US735	AC6030M AC630M	T6030		CA6525	TT5100 TT7100	NC9025	CTC1125 CTC1135 CTC1425 CTC1435 CTC2135
	M40	FSV40	GC2025	KCM35 KC9240 KC9245	IC6025 IC9350	TM4000	US735	AC6030M AC630M				TT7100	NC9025	CTC2135
K	K01	FSV05	GC3205 GC3210	KCK05	IC5005 IC9007	TH1500 TK1001 TK1000	MC5005 UC5105	AC405K AC410K	T5105	WAK10	CA4505 CA4010			
	K10	FSV05 FTR20	GC3205 GC3210 GC3215	KCK15B KCK15B KC920 KC9315	IC5005 IC5010 IC9150 IC428 IC4028	TK1001 TK1000 TK2000 TK2001	MC5015 UC5115 MY5015	AC405K AC410K AC415K AC420K AC700G	T5115	WAK20	CA4515 CA4110 CA4115	TT3100 TT7310 TT8115	NC6205 NC6210 NC6215	CTC1110 CTC1115 CTC3110 TCC410 CTC3215
	K20	FTR20	GC3215	KCK20 KC9110 KC9325	IC5010 IC8150 IC9150 IC9015 IC418	TK2001 TK2000	MC5015 UC5115 UE6110 MY5015	AC415K AC420K AC700G AC820P	T5115 T5125	WAK30	CA4515 CA4115 CA4120	TT7310 TT8115	NC6215	CTC1115 CTC1125 CTC1130 CTC1425 CTC3215
	K30	FSV40		KC9125 KC9325	IC9015 IC418		UE6110	AC820P	T5125					TSC30
S	S01		S05F				US905				CA6515 CA6525 CA6535			

P – steel

K – cast iron

M – stainless steel

S – heat resistant / titanium alloys

Negatives

ISO		Melcor	Sandvik	Kennametal	Iscar	Seco	Tungaloy	Mitsubishi	Sumitomo	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Mat.	Operations													
P	Finishing	MF	QF	FS, LF	SF, PP TF		01 TF	PK FH	FA		DP	FA	VF, HU	
	Medium to Finishing	MF, LC	PF, QF, LC MF, R/L-K	FF, FN	F3P, NF, SF	FF2, FF1	TS, TSF, ZF 11, NS, AS, TQ, NM, CB, C	SA, FY, C, SH, MP	SU, FL, SE, SX	NF3, NS6	PQ, VFCJ PQ, GP, PP, HQ, GS, CQ	FG, VF, EA FC, MC, ML, MP	VL	CF, TF
	Medium Wiper	MW	WL, WF, WMX WM, WR	FW, MW, RW	WF, WG	W- MF2, W- MF3	AFW, FW, ASW, SW	SW	LUW, SEW, GUW	NF, NM	WP, WQ	WS, WT		TFQ, TMQ
	Medium to Roughing	PM, MR	PM, QM, XM, XRM	P, MN	M3P, M3M, PP, TF, GN	MR7, MR6, M5, M6	TM, AM, DM, ZM All-round	MA, MH, MP	GU GE, UX	NMT, NM4	HS, PT, GT, CS, PS	PC, MT MC, MG-	VM	TMF, TMM M50
	Roughing	HR, RP*	HM, PR MR	RN, RP MR	NR MR	MR6, R5	TH, THS	RP, GH HZ, HL	MU, ME HG	NM5, NM6 NM9	PH All-round	RT	GR, HR	TM, TRM
	Heavy Roughing	RP*, HY*, HZ*	PR, MR, HR, QR	RM RH	R3P, NM	R4, RR6	TU, TRS, TUS	HM, HX HV	HG, HP HU, HW HF	NR6, NRF NRR	PX	HT, HD RX, RH HY, HZ	GH, VT	TRR, TR, R28, R58 R88
M	Finishing	MF, SF	MF, XF, LC, R/L-K	FP	TF, VL	FF2, FF1, MF1	SF, SA, SS	GM, MS, SH, LM	EX, EG, SU, EF	NF4 NMS	GU, MQ	EA, SF, SU, FG	VP2	CF, F30 M34 F32, TF
	Medium	MS, SF	MM, QM, XM, XRM	MP, P	M3M, PP	MF2, FF2, MF5	SM S	MM, MA ES	GU HM	NM4	TK MU	EM, ET	VP3, HS	TMF, M42 M30, M52
	Roughing	SS, RP, HZ*	MR HM, PR	UP, RP	MR, MH	M5, M6, R8, R5, R6	TH, SH, TU	GH, RM, HZ	EM, MU	NR4, NRT, NRS	MS		"GR, VM, VH, GH"	TM, M60, TRM, TMR, TRR R80
K	Medium to Finishing	ST	KF, XF	FN	GN	M4, M5	CF	LK, MA	UZ		C	FG	B25	CF
	Medium	ST, HR, FLAT	KM, QM, XM, XRM	RP, UN		FLAT	CM All-round	MK GK	GZ	NM5	ZS All-round	MT MG	FLAT	M50
	Roughing to Heavy Roughing	HR, FLAT, HZ*	KR Without chip-breaker	Without chipbreaker		MR7, M5	CH Without chip-breaker	RK Without chip-breaker	Without chip-breaker	Without chip-breaker	GC Without chip-breaker	RT	GR	TMR, TR R28, R58, R88
N	Medium	MS	MF, QM	MS, MP MG	PP		P		AX		AH, A3	ML	HA	F32
S	Finishing	SF, MS	SF 01	FS, LS MS		MF1, M1	HRF	FJ, LS	EF EX	NFT NF4	MQ	SF	VP1	
	Medium	SF, SS	MM, QM SMR	UP, P, NGP RP	PP	MR3, MR4	HRM, HMM, SA	MS RS GJ	EG MU	NMS NM4, NRS, NR4	TK MS MU	SU	VP2, VP3	M34, M52

P – steel

K – cast iron

S – heat resistant / titanium alloys

M – stainless steel

N – aluminium

MS = Best available choice

* = Wiper

" = Single face insert

Positivas — clearance angle 5°, 7° and 11°

ISO		Melcor	Sandvik	Kennametal	Iscar	Seco	Tungaloy	Mitsubishi	Sumitomo	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Mat.	Operations													
P	Fine Finishing	FS	UM	UF	SF	F1, MF2	01	FV, SMG	FC, FW	PF2	CF, CK	FA	HFP	F32
	Finishing	FS, FP	R/L-K, PF, XF, UF	11, GM, LF	PF, SM, 14, 17, 19, XL	FF1, F2, M3, MF2	PSF, PF, SS, PS, PSS, TS	FP, FV, SV, LP	FP, FZ, LU, FK, SS, SC, SU, SK, SF	PF5, PF4, PS5	CQ, GK, GP, HQ, XP, XQ	FG, GF	VF, VL, F	SF, SMF, SMQ
	Finishing Wiper	FW	WF	FW	WF	W-F1	TSW, W08	SW	LUW, SDW	PF				
	Finishing to Medium	MP	PM	MF, MP, GM, MR	DT, HQ	MF2	PM, 23, 24, RS	MP, MV	SU, UM, UJ	PM5	VF, MF	MT, PC	HMP, C25, M, CMX	SM
	Finishing to Medium Wiper	MW	WM	MW	WG			MW		PM		WT		
M	Fine Finishing	FS	UM	LF, GM	SM	F1, MF2, FF1	PSF	FJ	FC	PF2	GQ, GF	FG	HFP	
	Finishing	FS, FM, LM	MF, UF, R/L-K	MF	PF, 14	F2, M3	SS, PSS	FM, FV, SV	SU	PF4	MQ	FA	VF, F	SF, SMF, SMQ
	Finishing Wiper	FW	WF	FW	WF	W-F1		SW		PF				
	Finishing to Medium	MM, LM	MM, XM	MF, MP	SM	MF2, M5	PM	MM, MV	UM	PM5	XQ, VF	MT, PC	HMP, C25, M	F23, F43, SM
	Finishing to Medium Wiper	MW	WM	MW	WG			MW		PM		WT		
K	Finishing	FK	KF	11	PF	M3		FV	SK		GK	FA	HMP	SF
	Finishing Wiper	FW	WF	FW	PF	W-F1		SW	LUW	PF		MT, PC		
	Finishing to Medium	MK, FLAT	KM, KR	MF, MP, FLAT	PM5, 19, FLAT	M5	CM, FLAT	MV, MK, FLAT	UM, FLAT	PM5, PS5	FLAT	FALT	C25, HMP, FLAT	25P, 27, 29
	Finishing to Medium Wiper	MW	WM	MW		W-F2		MW		PM		WT		
N	Medium	LN	AL	HP, GT	AF, AS	AL	AL, PP	AZ, R/L-F	AG, AX, AY	PF2, PM2	AH, A3	FL	AK, AR	23P, 25P, 27
S	Fine Finishing	FS	UM	LF	SM	F1, MF2	PSF, PF, SS, PS, PSS, TS	FJ	FC	PF2	GQ		HFP	SF
	Finishing	FM, LM	MF, UF, R/L-K	GM	PF, 14	F1	PSS, PS	FV	FX, FY	PF4	MQ	FA	HFP	F23, F43, SM
	Finishing Wiper	FW	WF	FW	WF					PF				
	Finishing to Medium	MM, LM	MM, XM	MF	SM		PM	MV	SI	PM5	MQ	FG	HMP	SM, 25P, 29
	Finishing to Medium Wiper	MW	WM	MW	WG					PM				

P – steel
M – stainless steel

K – cast iron
N – aluminium

S – heat resistant / titanium alloys

Negatives

Insert Type	NEGATIVES – double side																	
	Klux's			Medium Finishing			Roughing to Medium			Medium Finishing								
Application	Medium			Medium Finishing			Roughing to Medium			Medium Finishing								
Tolerance Class	U	P	M	K	M	P	M	M	P	M	M	P	M	S				
Major field of Application	01			02			01			02			03					
Geometry	01			02			01			02			03					
Cutting Edge*	at the nose radius																	
	at the flank																	
Cutting Conditions**	Feed F _n (mm/rev)	0,20 to 0,35			0,40 to 0,70			0,12 to 0,50			0,15 to 0,50			0,05 to 0,60				
	Depth of cut DOC (mm)	1,00 to 6,00			1,50 to 6,00			1,00 to 6,50			0,70 to 5,00			0,10 to 2,50			0,20 to 4,50	
Available Shapes	KN																	
	CN																	
	DN																	
	RN																	
	SN																	
	TN																	
	VN																	
WN																		

* T-Land varies according to the IC (IC reference used: 12,7mm)
 ** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Negatives

NEGATIVES — double side																									
Insert Type	Application	Medium Finishing	Medium Finishing	Medium Finishing	Medium Finishing	Medium Finishing	Medium Finishing	Medium Finishing	Medium Wiper	Roughing to Medium roughing	Finishing														
Tolerance Class	Major field of Application	M	P	K	M	P	K	M	P	M	K														
Geometry		LC			ST			MR			PM			Flat			MW			SS			HR		
Cutting Edge*	at the nose radius																								
	at the flank																								
Cutting Conditions**	Feed Fn (mm/rev)	0,07 to 0,50			0,10 to 2,50			0,10 to 0,70			0,10 to 0,60			0,08 to 2,50			0,15 to 0,90			0,10 to 1,00			0,20 to 1,20		
	Depth of cut DOC (mm)	0,60 to 3,00			0,15 to 10,50			0,30 to 9,00			0,30 to 0,90			0,10 to 15,00			0,30 to 6,00			0,30 to 8,50			0,80 to 15,00		
Available Shapes	KN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	CN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	DN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	RN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	SN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	TN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
	VN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕													
WN	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕														

* T-Land varies according to the IC (IC reference used: 12,7 mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Negatives

Insert Type		NEGATIVES – single side					
Application		Roughing		Heavy Roughing to Roughing		Heavy Finishing	
Tolerance Class		M		M		M	
Major field of Application		P	M	P	M	P	K
Geometry		RP		HY		HZ	
Cutting Edge*	at the nose radius						
	at the flank						
Cutting Conditions**	Feed Fn (mm/rev)	0,30 to 1,50		0,35 to 1,60		0,35 to 1,60	
	Depth of cut DOC (mm)	2,00 to 12,00		2,00 to 15,00		2,40 to 17,00	
Available Shapes	KN_ _ _						
	CN_ _ _	◆		◆		◆	
	DN_ _ _						
	RN_ _ _						
	SN_ _ _		◆		◆		◆
	TN_ _ _						
	VN_ _ _						
	WN_ _ _						

* T-Land varies according to the IC (IC reference used: 12,7 mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Positives

Insert Type	POSITIVES — Clearance angle 5° and 7°															
	Fine Finishing						wiper									
Application	Fine Finishing						wiper									
Tolerance Class	M	P	M	S	M	S	M	P	M	S	M	S				
Major field of Application	FP		BO		FM		FK		FW		LM		FS		LN	
Geometry	FP		BO		FM		FK		FW		LM		FS		LN	
Cutting Edge*																
at the nose radius	6	6	5	5	6	6	6	6	18	18	0,10	20° 8°	8	8	25	25
at the flank	6	6	5	5	6	6	6	6	18	18	6°	6°	6	6	20	20
Feed Fn (mm/rev)	0,03 to 0,45		0,05 to 0,30		0,03 to 0,45		0,03 to 0,30		0,05 to 0,50		0,08 to 0,35		0,01 to 0,25		0,05 to 1,60	
Depth of cut DOC (mm)	0,06 to 2,40		0,30 to 1,50		0,06 to 2,40		0,06 to 2,40		0,30 to 3,50		0,20 to 3,00		0,10 to 3,00		0,05 to 7,00	
Available Shapes	CC_--	⊕									⊕					⊕
	DC_--	⊕									⊕					⊕
	RC_--															⊕
	SC_--	⊕														⊕
	TC_--	⊕													⊕	⊕
	VC_--	⊕													⊕	⊕
	VB_--	⊕														⊕

* T-Land varies according to the IC (IC reference used: 12,7 mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Positives

Insert Type Application	POSITIVES — Clearance angle 5° and 7°																								
	Finishing						Finishing Wiper			Medium			Medium to finishing												
	M	K	Flat	M	P	MP	M	M	S	MM	M	K	S	MK	M	P	M	S	CP	M	P	M	S	RF	
Geometry																									
Cutting Edge*																									
at the nose radius																									
at the flank																									
Feed Fn (mm/rev)			0,04 to 0,80			0,06 to 0,60			0,06 to 0,60				0,06 to 0,60					0,10 to 0,50						0,25 to 2,50	
Depth of cut DOC (mm)			0,05 to 6,30			0,19 to 3,60			0,19 to 3,60				0,19 to 3,60					0,50 to 4,00						2,50 to 10,00	
Available Shapes																									
CC_--	DC_--	RC_--	SC_--	TC_--	VC_--	VB_--																			

* T-Land varies according to the IC (IC reference used: 12,7mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Positives

Insert Type		POSITIVES—Clearance angle 11°									
Application		Medium to Finishing					Finishing to Fine Finishing				
Tolerance Class		M					U				
Major field of Application		P	M	K	S	P	M	K	P	M	K
Geometry		Flat									
Cutting Edge*	at the nose radius										
	at the flank										
Cutting Conditions**	Feed Fn (mm/rev)	0,05 to 2,20					0,03 to 0,55				
	Depth of cut DOC (mm)	1,00 to 10,00					0,10 to 3,00				
Available Shapes	CC_ _ _										
	DC_ _ _										
	RC_ _ _										
	SC_ _ _										
	TC_ _ _										
	VC_ _ _										
	VB_ _ _										

Insert Type		POSITIVES—Clearance angle 5° and 7°									
Application		Roughing to Medium									
Tolerance Class		M									
Major field of Application		P	M	K	P	M	K	P	M	K	
Geometry		ST RM RR									
Cutting Edge*	at the nose radius										
	at the flank										
Cutting Conditions**	Feed Fn (mm/rev)	0,05 to 3,20					0,80 to 2,50				
	Depth of cut DOC (mm)	0,80 to 12,80					3,20 to 13,00				
Available Shapes	CC_ _ _										
	DC_ _ _										
	RC_ _ _										
	SC_ _ _										
	TC_ _ _										
	VC_ _ _										
	VB_ _ _										

* T-Land varies according to the IC (IC reference used: 12,7 mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Cutting speed (m/min)

ISO	Material	HB (brinell)	CVD Coating											
			Wear Resistance						Toughness					
			FO15			GO15			FO25			GO25		
	Unalloyed steel	125-170	250-350	180-270	170-220	250-350	180-270	170-220	200-295	170-240	150-215	200-295	170-240	150-215
	Low-alloy steel	180-350	190-250	170-230	140-180	190-250	170-230	140-180	170-230	140-210	120-190	170-230	140-210	120-190
	High-alloy steel	200-325	135-220	120-205	110-200	135-220	120-205	110-200	125-215	110-185	100-170	125-215	110-185	100-170
P	Material	HB (brinell)	PVD Coating											
			Wear Resistance						Toughness					
			FSV40			SVN10			SVN20					
	Unalloyed steel	125-170	135-230	120-210	115-200	140-245	130-225	115-220	130-230	120-220	110-210	130-230	120-220	110-210
	Low-alloy steel	180-350	125-205	105-185	95-185	130-230	125-225	125-215	125-220	115-210	100-200	125-220	115-210	100-200
	High-alloy steel	200-325	105-205	75-175	50-135	-	-	-	-	-	-	-	-	-

ISO	Material	HB (brinell)	CVD Coating								
			Wear Resistance						Toughness		
			FO15			FO25			FSV40		
	SS — Ferretic/martensitic	200-330	125-260	100-220	80-200	110-230	70-175	50-135	85-180	65-160	45-135
	SS — Austenitic	180-330	130-290	100-240	80-190	100-240	70-175	55-130	85-170	65-145	45-125
	SS — Austenitic-ferretic (Duplex)	230-260	190-220	150-185	120-145	150-190	120-150	90-110	130-160	110-135	85-105
M	Material	HB (brinell)	PVD Coating								
			Wear Resistance						Toughness		
			SVN10			SVN20					
	SS — Ferretic/martensitic	200-330	128-230	120-220	115-215	133-235	130-225	120-220	133-235	130-225	120-220
	SS — Austenitic	180-330	124-225	115-215	105-205	129-223	125-220	115-215	129-223	125-220	115-215
	SS — Austenitic-ferretic (Duplex)	230-260	121-212	110-205	100-195	125-216	115-210	100-200	125-216	115-210	100-200

ISO	Material	HB (brinell)	CVD Coating								
			Wear Resistance						Toughness		
			FSV05			FTR20			FSV40		
	Marble cast iron	130-230	160-360	140-280	120-235	150-330	130-240	110-220	110-230	100-215	100-190
	Grey cast iron	180-220	220-380	190-330	150-290	200-330	170-280	150-230	150-230	140-220	110-210
	Modular cast iron	160-380	150-280	135-265	120-220	140-250	125-230	110-220	125-220	115-205	105-185

ISO	Material	HB (brinell)	Uncoated	
			ZN10	
			0.1	0.3
	Alluminium alloys	60-130	375-2400	40-240
	Cooper and cooper alloys	90-110	375-630	35-65

ISO	Material	HB (brinell)	CVD Coating					
			Wear Resistance			Toughness		
			SVN10			SVN20		
	Heat resistant super alloys (Iron base)	200-280	75-130	62-127	55-115	70-120	55-115	50-110
	Heat resistant super alloys (Nickel base)	250-320	55-95	40-90	33-85	35-80	27-75	23-70
	Heat resistant super alloys (Cobalt base) 200	200-320	55-95	40-90	33-85	35-80	27-75	23-70
	Titanium alloys (400<or<1050[MPa])	-	80-172	70-162	65-155	65-152	50-145	45-135

Selection guide for negative inserts – single side ...nmm's

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			HOLDERS
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type		#NMM	Type
P	Unalloy steel HB 110 DIN C15 C45		RP	FO25	RP	FO25	HZ	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	HY	FO25	HZ	FO25				
			RP	FO25	HY	FSV40	HZ	FSV40				
	Low Alloyed Steel HB180 DIN 21NiCrM02 36CrNiM04		RP	FO25	RP	FO25	HZ	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	HY	FO25	HZ	FO25				
			RP	FO25	HY	FO25	HZ	FO25				
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4		RP	FO25	RP	FO25	HZ	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	HY	FO25	HZ	FO25				
			RP	FO25	HZ	FSV40	HZ	FSV40				
	High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93		RP	FO25	RP	FO25	HZ	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	HY	FO25	HZ	FO25				
			RP	FO25	HZ	FO25	HZ	FO25				
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17		RP	FO25	RP	FO25	HY	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	HY	FO25	HY	FO25				
			RP	FO25	HY	FSV40	HY	FSV40				
	Austenitic stainless steel DIN X5CrNi189 X5CrNiMo18		RP	FO25	RP	FO25	HS	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	RP	FO25	HY	FO25				
			RP	FO25	HY	FSV40	HY	FSV40				
	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27		RP	FO25	RP	FO25	HY	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			RP	FO25	RP	FO25	HY	FSV40				
			RP	FO25	HY	FSV40	HY	FSV40				
K	Grey cast iron HB 220 DIN GG15 GG25 GG35		HZ	FTR20	HZ	FTR20	HY	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			HZ	FTR20	HZ	FTR20	HY	FO25				
			HZ	FSV40	HZ	FSV40	HY	FSV40				
	Nodular cast iron HB 180 DIN GGG40 GGG50 GGG70		HZ	FTR20	HZ	H5320	HY	FO25	 Negative single side	 Conventional Nose Radius	#NMM	D##N M##N M##N-K
			HZ	FSV40	HZ	FSV40	HY	FO25				
			HZ	FSV40	HZ	FSV40	HY	FSV40				
			HZ	FSV40	HZ	FSV40	HY	FSV40				

- First choice
- Stock Itens
- Available under request

Selection guide for negative inserts — double side ...nmms

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			HOLDERS
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type		#NMG	Type
P	Unalloyed steel HB 110 DIN C15 C45 C60		MF	FO15	LC	FO15	MR PM	FO15 GO15	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			MF	FO25	LC	FO25	MR	FSV40	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
			MW	FO15	MW	FO15	MW	FO15	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4		MF	SVN10	MR PM	FO15 GO15	HR	FO15	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			MF	FO25	MR PM	FSV40	HR	FSV40	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
			MW	FO15	MW	FO15	MW	FO15	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4		MF	SVN10	MR PM	FO15 GO15	HR	FO15	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			MF	FO25	MR PM	FSV40	HR	FSV40	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
			MW	FO15	MW	FO15	MW	FO15	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
High alloyed steel HB 400 DIN X40CrMoV5 X45CrSi93		MF ST	SVN10 FSV05	MR PM	FO15 GO15	HR	FO15	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N	
		MF	FO15	MR PM	FO25 GO25	HR	FO25	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°	
		MW	FO15	MW	FO15	MW	FO15	Negative double side	Wiper Nose Radius	DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°	
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17		SF	SVN10	SS	SVN10	HR	FO25	Negative double side	Conventional Nose Radius	#NMG	
			SF	SVN20	SS	SVN20	HR	FSV40	Negative double side	Wiper Nose Radius	DNMG TNMG	
			MW	FO15	MW	FO25	-	-	Negative double side	Wiper Nose Radius	DNMG TNMG	

Double Side...nmg's

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holder
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type		#NMG	Type
M	Austenitic stainless steel		SF	SVN10	SS	SVN10	HR	FO25	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			SF	SVN10	SS	SVN10	HR	FO25				
			SF	SVN20	SS	SVN20	HR	FSV40				
			MW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	FO15	MW	FO25	-	-				
	Duplex stainless steel		SF	SVN10	SS	SVN10	HR	FO25	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			SF	SVN20	SS	SVN20	HR	FO25				
			SF	SVN20	SS / HR	FSV40	HR	FSV40				
			MW	FO15	-	-	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			-	-	-	-	-	-				
K	Grey cast iron		Flat	FSV05	Flat	FTR20	HR	FSV05	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			ST	FTR20	ST	FSV05	HR	FSV05				
			ST	FTR20	ST	FTR20	HR	FTR20				
			MW	FTR20	MW	FTR20	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	FTR20	MW	FTR20	-	-				
	Nodular cast iron		Flat	FSV05	ST	FSV05	HR	FSV05	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			ST	FTR20	ST	FTR20	HR	FTR20				
			ST	FTR20	ST	FTR20	HR	FTR20				
			MW	FTR20	MW	FTR20	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	FTR20	MW	FTR20	-	-				
S	Titanium Alloys		SF	SVN20	MS	SVN20	SS	SVN20	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			SF	SVN20	MS	SVN20	SS	SVN20				
			SF	SVN20	MS	SVN20	SS	SVN20				
S	Super Alloys		SF	SVN20	MS	SVN20	SS	SVN20	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			SF	SVN20	MS SS	SVN20	SS	SVN20				
			SF	SVN20	MS SS	SVN20	SS	SVN20				
N	Super Alloys		MS	ZN10	MS	ZN10	-	-	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
			MS	ZN10	MS	ZN10	-	-				
			MS	ZN10	MS	ZN10	-	-				

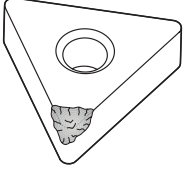
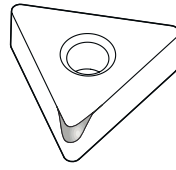
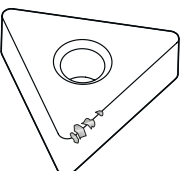
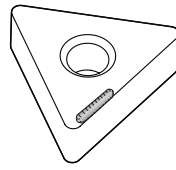
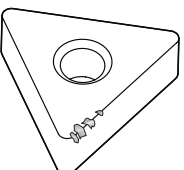
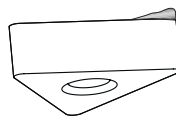
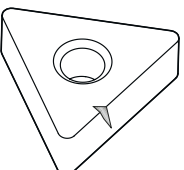
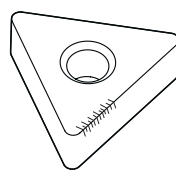
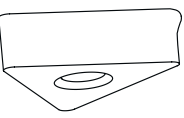
Single side...cmt's, bmt's, cgt's, rcmx's, rcmt's

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holder	
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type		#CMT	#BMT	Type
P	Unalloyed steel HB 110 DIN C15 C45 C60	○	FP	FO15	MP	FO15	MP	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B
				FO15		FO25		FO25					
		⊗	FP	FO25	MP	FO25	MP	FO25	Negative double side	Wiper Nose Radius	CCMT	S##C 95°	
				FO15		FO15		FO15					
		⊗	FW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°	
	FO15			FO15		FO15							
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4	○	FP	FO15	MP	FO15	MP	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B
				FO15		FO25		FO25					
		⊗	FP	FO25	MP	FO25	MP	FO25	Negative double side	Wiper Nose Radius	CCMT	S##C 95°	
				FO15		FO15		FO15					
		⊗	FW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°	
	FO15			FO15		FO15							
	High alloyed Steel HB 200 DIN 34CrNiMo6 42CrMo4	○	FP	FO15	MP	FO15	MP	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B
				FO15		FO25		FO25					
		⊗	FP	FO25	MP	FO25	MP	FO25	Negative double side	Wiper Nose Radius	CCMT	S##C 95°	
FO15				FO15		FO15							
⊗		FW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°		
	FO15		FO15		FO15								
High alloyed Steel HB 400 DIN X40CrMoV5 X45GrSi93	○	FP	FO15	MP	FO15	MP	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B	
			FSV05		FO15		FTR20						
	⊗	FP	FO15	MP	FO15	MP	FO15	Negative double side	Wiper Nose Radius	CCMT	S##C 95°		
			FSV05		FO15		FTR20						
	⊗	FW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°		
FO15			FO15		FO15								
M	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	○	FM	SVN10	LM / MM	SVN10	MM	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B
				SVN10		MM		SVN10					
		⊗	FM / LM	SVN10	MM	SVN10	MM	FO15	Negative double side	Wiper Nose Radius	CCMT	S##C 95°	
				SVN20		MM		SVN20					
		⊗	FW	SVN20	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°	
SVN20	MM			SVN20									
Austenitic stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	○	FM / LM	SVN10	LM / MM	SVN10	MM	FO15	Negative double side	Conventional Nose Radius	#CMT	#BMT	S##C S##B	
			SVN20		MM		SVN20						
	⊗	FM / LM	FO25	MM	FO15	MM	FO15	Negative double side	Wiper Nose Radius	CCMT	S##C 95°		
			SVN20		MM		SVN20						
	⊗	MW	SVN20	MW	SVN20	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°		
FO15			MM		FO15								
⊗	MW	FO15	MW	FO15	-	-	Negative double side	Wiper Nose Radius	DCMT	S##C 93°			
		FO15		MM		FO15							

Single side...cmt's, bmt's, cgt's, rcmx's, rcmt's

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holder		
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type		#CMT #BMT	Type		
M	Duplex stainless steel		FM / LM	SVN10	LM / MM	SVN10	MM	FO15		Conventional Nose Radius	#CMT #BMT	S##C S##B		
			FM / LM	SVN10	MM	SVN10	MM	FO15						
	DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22			FM / LM	FO25	MM	FO15	MM	FO15		Wiper Nose Radius	CCMT	S##C 95°	
				-	-	-	-	-	-					
				-	-	-	-	-	-					
				-	-	-	-	-	-					
K	Grey cast iron		FK	FSV05	MK	FSV05	MK	FSV05		Conventional Nose Radius	#CMT #BMT	S##C S##B		
			FK	FSV05	MK	FSV05	MK	FTR20						
	HB 220			MK	FTR20	MK	FTR20	MK	FTR20		Wiper Nose Radius	CCMT	S##C 95°	
				FW	FSV05	MW	FTR20	-	-					
				FW	FSV05	MW	FTR20	-	-					
				MW	FTR20	MW	FTR20	-	-					
	Nodular Cast Iron	HB 220		FK	FSV05	MK	FTR20	MK	FTR20		Conventional Nose Radius	#CMT #BMT	S##C S##B	
				FK	FSV05	MK	FTR20	MK	FTR20					
		DIN GG15 GG25 GG35			MK	FTR20	MK	FTR20	MK	FTR20		Wiper Nose Radius	CCMT	S##C 95°
					FW	FSV05	MW	FTR20	-	-				
					FW	FSV05	MW	FTR20	-	-				
					MW	FTR20	MW	FTR20	-	-				
S	Titanium Alloys		FS	SVN10	FM	SVN10	MM	SVN20		Conventional Nose Radius	#CMT #BMT	S##C S##B		
			FM	SVN20	MM	SVN20	MM	SVN20						
			MM	SVN20	MM	SVN20	MM	SVN20						
			FW	SVN20	FW	SVN20	-	-						
			FW	SVN20	MW	SVN20	-	-						
			MW	SVN20	MW	SVN20	-	-						
	Super alloys			FS	SVN10	FM	SVN10	MM	SVN20		Conventional Nose Radius	#CMT #BMT	S##C S##B	
				FM	SVN20	FM	SVN20	FM	SVN20					
				MM	SVN20	MM	SVN20	MM	SVN20					
				FW	SVN20	FW	SVN20	-	-					
				FW	SVN20	MW	SVN20	-	-					
				MW	SVN20	MW	SVN20	-	-					
N	Austenitic stainless steel		LN	ZN10	LN	ZN10	-	-		Conventional Nose Radius	#CMT #BMT	S##C S##B		
			LN	ZN10	LN	ZN10	-	-						
			LN	ZN10	LN	ZN10	-	-						

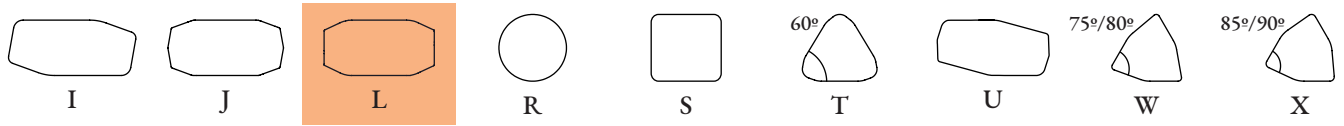
Tool life problems

Problem	Possible Solution	Problem	Possible Solution
Breakage or too short tool life 	<ol style="list-style-type: none"> 1. Reduce the cutting conditions (first feed rate, then cutting depth). 2. Look at the wear pattern on the insert and use the table below as a guideline for improvement. 	Flank wear 	<ol style="list-style-type: none"> 1. Reduce the cutting speed (V_c). 2. Select a more wear-resistant grade (ex: P40 -> ... -> P10). 3. Select a toolholder or chipbreaker 4. which allow a bigger relief angle. 5. Increase the rake angle. 6. Increase nose radius (R_n). 7. Reduce honing edges.
Insert fracture 	<ol style="list-style-type: none"> 1. Reduce the feed rate (F_n). 2. Reduce the depth of cut (A_p). 3. Select a tougher grade (ex: P10 -> ... -> P40). 4. Use a more rigid toolholder. 5. Increase nose radius (R_n). 6. Select a stronger chipbreaker. 7. Reduce the toolholder length. 8. Select larger shank size. 	Crater wear 	<ol style="list-style-type: none"> 1. Reduce the cutting speed (V_c). 2. Reduce the feed rate (F_n). 3. Select a more wear-resistant grade (ex: P40 -> ... -> P10). 4. Use coolant. 5. Increase the rake angle. 6. Increase nose radius (R_n).
Edge chipping 	<ol style="list-style-type: none"> 1. Increase the cutting speed (V_c). 2. Reduce the feed rate (F_n). 3. Select a stronger chipbreaker. 4. Select a tougher grade (ex: P10 -> ... -> P40). 5. Reduce the rake angle. 6. Increase honing edges. 7. Reduce the toolholder length. 8. Select larger shank size. 	Built-up edge 	<ol style="list-style-type: none"> 1. Increase the cutting speed (V_c). 2. Reduce the feed rate (F_n). 3. Use water-insoluble coolant fluid. 4. Select a more easy-cutting chipbreaker. 5. Increase the rake angle. 6. Reduce honing edges. 7. Select grade with low tendency to adhesion.
Notch wear 	<ol style="list-style-type: none"> 1. Reduce the cutting speed (V_c). 2. Reduce the feed rate (F_n). 3. Select a tool with a smaller setting angle (K_r°). 4. Select a more wear-resistant grade (ex: P40 -> ... -> P10). 	Thermal cracks 	<ol style="list-style-type: none"> 1. Reduce the cutting speed (V_c). 2. Increase the feed rate (F_n). 3. Use more coolant and correct it volume/accuracy. 4. Reduce honing edges. 5. Select a tougher grade (ex: P10 -> ... -> P40). 6. Increase the rake angle.
Plastic deformation 	<ol style="list-style-type: none"> 1. Reduce the cutting speed (V_c). 2. Reduce the feed rate (F_n). 3. Select a more wear-resistant grade (ex: P40 -> ... -> P10). 4. Use more coolant and correct it volume/ accuracy. 5. Choose grade with better heat conductivity. 6. Increase the rake angle. 7. Increase nose radius (R_n). 8. Increase relief angle. 		

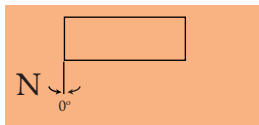
Heavy turning

1. L 2. N 3. G 4. F 5. 20 6. 10 7. 35 8. MP

1. L—Insert Shape



2. N—Clearance Angle



3. G—Tolerances

Symbol	A	F	C	H	E	G	J	K*	L*	M*	N*	U*
m (mm)	±0.005	±0.005	±0.013	±0.013	±0.025	±0.025	±0.005	±0.013	±0.025	±0.08~ ±0.20	±0.08~ ±0.20	±0.13~ ±0.38
d (mm)	±0.025	±0.013	±0.025	±0.013	±0.025	±0.025	±0.05~ ±0.13	±0.05~ ±0.13	±0.05~ ±0.13	±0.05~ ±0.13	±0.05~ ±0.13	±0.08~ 0.25
s (mm)	±0.025	±0.025	±0.025	±0.025	±0.025	±0.13	±0.025	±0.025	±0.025	±0.13	±0.025	±0.13

4. F—Insert type

Symbol	W	T	Q	U	B	H	C	J
Type	with hole	with hole	with hole	with hole	with hole	with hole	with hole	with hole
Type of hole	Round hole/ one countersink (40°~60°)		Round hole/ double countersink (40°~60°)		Round hole/ double countersink (70°~90°)			
Chipbreaker	Without chipbreaker	Chipbreaker on one side	Without chipbreaker	Chipbreaker on both side	Without chipbreaker	Chipbreaker on one side	Without chipbreaker	Chipbreaker on both side
Shape								

Symbol	A	M	G	N	R	F	X
Type	with hole	with hole	with hole	with hole	without hole	without hole	—
Type of hole	Round hole			—	—	—	±0.08~0.25
Chipbreaker	Without chipbreaker	Chipbreaker on one side	Chipbreaker on both side	Without chipbreaker	Chipbreaker on one side	Chipbreaker on both side	—
Shape							On request

5. **20** — Length of Cutting Edge (ln) 6. **10** — Thickness (S)

The length of the secondary cutting edge is indicated in mm

13 mm	25 mm
14 mm	27 mm
15 mm	28 mm
17 mm	38 mm
20 mm	44 mm
22 mm	50 mm

The length of the secondary cutting edge is indicated in mm

08 = 8,00 mm
09 = 9,52 mm
10 = 10,00 mm
12 = 12,00 mm
12 = 12,70 mm
13 = 13,00 mm
14 = 14,00 mm
18 = 18,00 mm

7. **35** — Depth of Cut (ap)

Maximum depth of cut

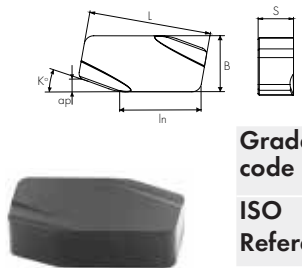
20 = 2,00 mm
25 = 2,50 mm
35 = 3,50 mm
40 = 4,00 mm
80 = 8,00 mm

8. **MP** — Chip Breaker

Chip breaker according to MELCOR geometries

FP	MH
ST	RP
MP	LH

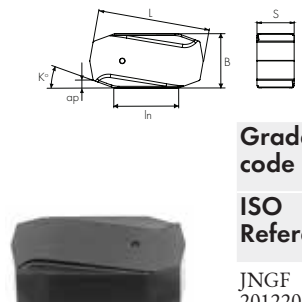
INGR – rectangular 90° negative



Technical drawing showing dimensions L, B, S, In, and ap. A photograph of the tool is shown below.

Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	In	B	S	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
INGR 221240-MP	☑	○	○	○	○	38,25	22,00	17,50	12,00	4,00	20	2,00	0,40	4,00	3,50	1,00	8,00								

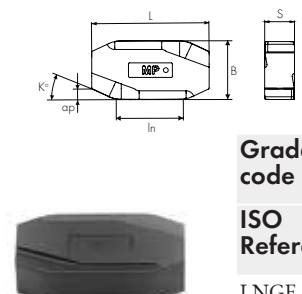
JNGF – rectangular 90° negative



Technical drawing showing dimensions L, B, S, In, and ap. A photograph of the tool is shown below.

Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	In	B	S	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
JNGF 201220-MP	○	☑	☑	○	○	36,90	20,00	18,00	12,00	2,00	20	1,50	1,00	2,00	3,50	1,50	6,00								
JNGF 201220-MP SP2	☑	☑	☑	○	○	36,50	20,00	18,00	12,00	2,00	20	1,50	1,00	2,00	3,50	1,50	6,00								
JNGF 271220-MP	○	○	○	○	○	36,90	27,00	18,00			20	1,50	1,00	2,00	3,50	1,50	6,00								

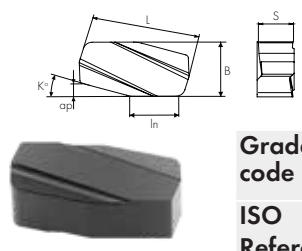
LNGF – rectangular 90° negative



Technical drawing showing dimensions L, B, S, In, and ap. A photograph of the tool is shown below.

Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	In	B	S	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
LNGF 201035-MP	☑	○	○	○	○	40,00	20,00	20,00	10,00	3,50	25	2,00	0,80	3,50	2,50	1,00	6,50								
LNGF 201235-MP	☑	○	○	○	○	40,00	20,00	20,00	12,00	3,50	25	2,00	0,80	3,50	2,50	1,00	6,50								

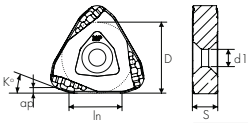
UNGF – rectangular 90° negative



Technical drawing showing dimensions L, B, S, In, and ap. A photograph of the tool is shown below.

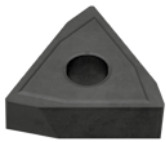
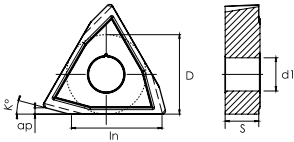
Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	In	B	S	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
UNGF 171240-MP	○	☑	☑	○	○	36,50	17,00	18,00	12,00	4,00	15	1,50	0,35	4,00	2,00	1,00	5,00								

TNMJ – triangular 60° negative



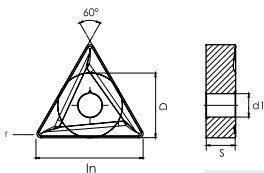
Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
TNMJ 201025-MP	○	⊕	⊕	○	○	28,60	20,00	10,00	7,00	2,50	20	1,00	0,70	2,50	3,00	1,00	5,50								
TNMJ 201425-MP	○	⊕	⊕	○	○	28,60	20,00	14,00	7,00	2,50	20	1,00	0,70	2,50	3,00	1,00	5,50								

TNGM – triangular 60° negative



Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
TNGM 220812-MP	○	⊕	⊕	○	○	19,05	22,00	8,00	7,96	1,20	15	0,70	0,20	1,30	14,00	5,00	18,00								


TNMM – triangular 60° negative



Grade code	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
TNMM 441116-LH	○	⊕	⊕	○	○	25,40	44,00	11,35	9,20	1,60	—	12,00	2,00	25,00	0,80	0,50	1,60								


⊕ First choice ⊕ Stock Items ○ Available under request

XNGF – special 85° negative




Grade code	P										M			K			Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max									
XNGF 150980-FP	○	○	○	⊕	○	28,58	15,00	8,88	—	8,00	30	3,00	1,00	4,50	6,00	4,00	12,00									

XNMJ – special 85° negative



Grade code	P										M			K			Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max									
XNMJ 151380-MP	○	⊕	⊕	⊕	○	31,75	15,00	13,00	9,00	8,00	25	3,00	1,00	6,50	6,00	4,00	12,00									
XNMJ 151380-MH	○	⊕	⊕	⊕	○	31,75	15,00	13,00	9,00	8,00	25	3,00	1,00	6,50	6,00	4,00	12,00									

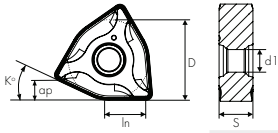
XNGJ – special 85° negative



Grade code	P										M			K			Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max									
XNGJ 151380-RP	○	○	○	⊕	○	31,75	15,00	13,00	9,00	8,00	25	3,00	1,00	6,50	6,00	4,00	12,00									

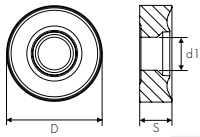
⊕ First choice ⊕ Stock Items ○ Available under request

WNGJ – special 75° negative



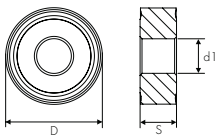
Grade code ISO Reference	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
WNGJ 130950-MP	○	⊕	⊕	⊕	⊕	28,21	13,00	9,00	7,93	5,00	15	3,00	0,50	5,00	6,00	3,00	11,00								

RNMX – round R° negative



Grade code ISO Reference	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
RNMX 381200-MP	○	○	○	⊕	○	38,10	—	12,70	13,00	—	—	4,00	2,00	8,00	2,00	1,00	4,00								
RNMX 5018M0-MP	○	○	○	⊕	○	50,00	—	18,00	12,70	—	—	6,00	2,00	12,00	3,50	2,50	6,50								
RNMX 5018M0-RP	○	○	○	⊕	○	50,00	—	18,00	12,70	—	—	6,00	2,00	12,00	6,00	4,00	10,50								

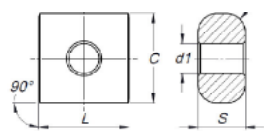
RNMG – round R° negative



Grade code ISO Reference	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	D	In	S	d1	ap	K°	ap (mm)	Min	Max	fn (mm/r)	Min	Max								
RNMG 250900-ST	○	○	○	○	⊕	25,40	—	9,52	9,12	—	—	5,00	2,50	10,00	1,00	0,25	2,50								

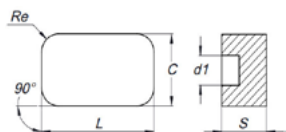
⊕ First choice ⊕ Stock Items ○ Available under request

LNUX-T – tangential 90° negative



Grade code ISO Reference	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	C	Re	S	d1	ap (mm)	Min	Max	fn (mm/r)	Min	Max									
LNUX 191940-RMM-T	⊕	⊕	○	○	○	19,05	19,05	4,0	10,0	6,35	2,50	1,60	8,00	0,80	0,30	1,50									
LNUX 301940-RMM-T	⊕	⊕	○	○	○	30,0	19,05	4,0	12,0	6,35	4,50	1,60	13,00	0,80	0,30	1,50									
LNUX 191940-RRM-T	⊕	⊕	○	○	○	19,05	19,05	4,0	10,0	6,35	5,50	2,50	10,00	1,00	0,80	1,50									
LNUX 191940-RHR-T	⊕	⊕	○	○	○	19,05	19,05	4,0	10,0	6,35	5,50	2,50	10,00	1,20	0,50	1,80									
LNUX 301940-RHR-T	⊕	⊕	○	○	○	30,00	19,05	4,0	12,0	6,35	6,50	3,00	15,00	1,20	0,50	1,80									

LNUX – rectangular 90° negative



Grade code ISO Reference	P					M					K					Dimensions					Cutting conditions				
	FO15	FO25	FO25	FTW28	FTR20	L	C	Re	S	d1	ap (mm)	Min	Max	fn (mm/r)	Min	Max									
LNUX 321248- RMM	⊕	⊕	○	○	○	31,75	19,05	4,76	12,7	7,87	3,00	1,50	18,00	0,80	0,30	1,50									
LNUX 321248- RRM	⊕	⊕	○	○	○	31,75	19,05	4,76	12,7	7,87	3,00	1,50	18,00	1,00	0,80	1,50									
LNUX 321248- RHR	⊕	⊕	○	○	○	31,75	19,05	4,76	12,7	7,87	3,00	1,50	18,00	1,20	0,50	1,80									

⊕ First choice ⊕ Stock Items ○ Available under request

Threading inserts

Partial Profile Example — 1. 16 2. ER 3. A 4. 55 5. SXN20

Full Profile Example — 1. 16 2. ER 3. 1.5 4. ISO 5. SXN20

1. 16 — Insert Size

I.C	4,00	5,00	6,35	9,525	12,70	15,875
L	06	08	11	16	22	27

2. ER — Insert Size

ER=EX. R. H. IR=IN. R. H.
EL=EX. L. H. IL=IN. L. H.

3. A, 1,5 — Pitch

Partial Profile	A	G	AG	N	Q	Full Profile
mm	0,5–1,5	1,75–3,0	0,5–3,0	3,5–5,0	5,5–6,0	mm 0,35–6,0
tpi	48–16	14–8	48–8	7–5	4,5–4	tpi 72–4

4. 55, ISO — Profile

Partial Profile

60°

55°

Full Profile

ISO METRIC

UN

WHITWORTH

BSPT

MJ

NPT

NPTF

TRAPEZ

ACME

STUBACME

AM. BUTTRESS

ROUND (DIN 405)

DIN 20400

PG

SAGENGWINDE

UNJ

API

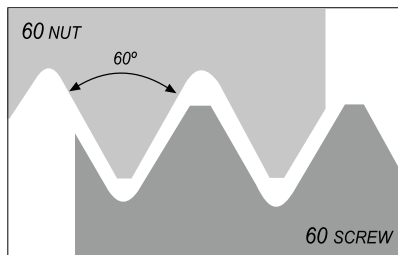
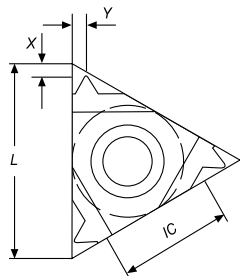
BUT. CASING

EXTREME LINE

5. SXN20 — Pitch

Grades	SXN20	EN20
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Partial profile 60°

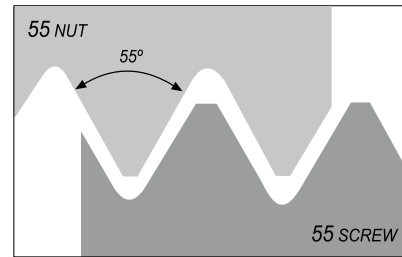
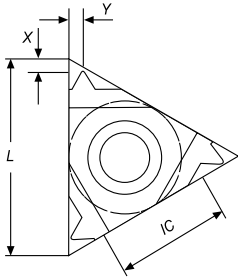


External Reference	Pitch		Dimensions (mm)				P		M		K		N		S	
	MM	TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER A60	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER A60	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER G60	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER AG60	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER N60	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER Q60	5,5-6,0	4,5-4	15,875	27	2,1	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL A60	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL A60	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL G60	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL AG60	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL N60	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL Q60	5,5-6,0	4,5-4	15,875	27	2,1	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch		Dimensions (mm)				P		M		K		N		S	
	MM	TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR A60	0,5-1,25	48-20	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR A60	0,5-1,5	48-16	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR A60	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR A60	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR G60	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR AG60	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR N60	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR Q60	5,5-6,0	4,5-4	15,875	27	2,1	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL A60	0,5-1,25	48-20	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL A60	0,5-1,5	48-16	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL A60	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL A60	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL G60	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL AG60	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL N60	3,5-5,0	7-5	12,70	22	1,8	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL Q60	5,5-6,0	4,5-4	15,875	27	2,1	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Partial profile 55°

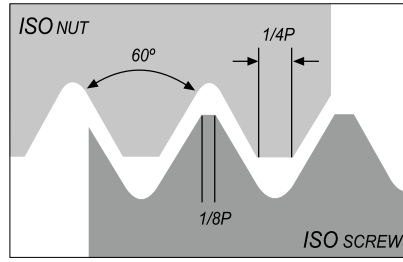
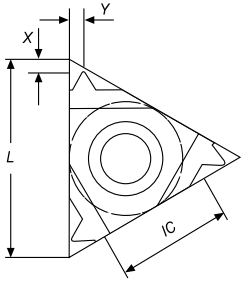


External Reference	Pitch		Dimensions (mm)				P		M		K		N		S	
	MM	TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER A55	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER A55	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER G55	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER AG55	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER N55	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER Q55	5,5-6,0	4,5-4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL A55	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL A55	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL G55	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL AG55	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL N55	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL Q55	5,5-6,0	4,5-4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch		Dimensions (mm)				P		M		K		N		S	
	MM	TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR A55	0,5-1,25	48-20	4,00	06	0,5	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR A55	0,5-1,5	48-16	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR A55	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR A55	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR G55	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR AG55	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR N55	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR Q55	5,5-6,0	4,5-4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL A55	0,5-11,25	48-20	4,00	06	0,5	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL A55	0,5-1,5	48-16	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL A55	0,5-1,5	48-16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL A55	0,5-1,5	48-16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL G55	1,75-3,0	14-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL AG55	0,5-3,0	48-8	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL N55	3,5-5,0	7-5	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL Q55	5,5-6,0	4,5-4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

ISO METRIC ISO 965-1: 1999-11 | DIN 13: 2005-08



External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 0,35 ISO	0,35	6,35	11	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,40 ISO	0,40	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,45 ISO	0,45	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,50 ISO	0,50	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,60 ISO	0,60	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,70 ISO	0,70	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,75 ISO	0,75	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 0,80 ISO	0,80	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 1,00 ISO	1,00	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 1,25 ISO	1,25	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 1,50 ISO	1,50	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 1,75 ISO	1,75	6,35	11	0,8	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 2,00 ISO	2,00	6,35	11	0,8	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,35 ISO	0,35	9,525	16	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,40 ISO	0,40	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,45 ISO	0,45	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,50 ISO	0,50	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,60 ISO	0,60	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,70 ISO	0,70	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,75 ISO	0,75	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 0,80 ISO	0,80	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,00 ISO	1,00	9,525	16	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,25 ISO	1,25	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,50 ISO	1,50	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,75 ISO	1,75	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 2,00 ISO	2,00	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 2,50 ISO	2,50	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 3,00 ISO	3,00	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 3,50 ISO	3,50	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 3,50 ISO	3,50	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4,00 ISO	4,00	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4,50 ISO	4,50	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5,00 ISO	5,00	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5,50 ISO	5,50	12,70	22	1,7	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6,00 ISO	6,00	12,70	22	1,9	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 5,50 ISO	5,50	15,875	27	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 6,00 ISO	6,00	15,875	27	1,8	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 EL 0,35 ISO	0,35	6,35	11	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,40 ISO	0,40	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,45 ISO	0,45	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,50 ISO	0,50	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,60 ISO	0,60	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,70 ISO	0,70	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,75 ISO	0,75	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 0,80 ISO	0,80	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 1,00 ISO	1,00	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 1,25 ISO	1,25	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 1,50 ISO	1,50	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 1,75 ISO	1,75	6,35	11	0,8	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 2,00 ISO	2,00	6,35	11	0,8	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,35 ISO	0,35	9,525	16	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,40 ISO	0,40	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,45 ISO	0,45	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,50 ISO	0,50	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,60 ISO	0,60	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,70 ISO	0,70	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,75 ISO	0,75	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 0,80 ISO	0,80	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 1,00 ISO	1,00	9,525	16	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 1,25 ISO	1,25	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 1,50 ISO	1,50	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 1,75 ISO	1,75	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 2,00 ISO	2,00	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 2,50 ISO	2,50	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 3,00 ISO	3,00	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 3,50 ISO	3,50	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 3,50 ISO	3,50	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4,00 ISO	4,00	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4,50 ISO	4,50	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5,00 ISO	5,00	12,70	22	1,7	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5,50 ISO	5,50	12,70	22	1,7	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6,00 ISO	6,00	12,70	22	1,9	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 5,50 ISO	5,50	15,875	27	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 6,00 ISO	6,00	15,875	27	1,8	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request



Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR 0,50 ISO	0,5	4,00	06	0,9	0,5	☐	○	☐	○	☐	○	☐	○	☐	○
06 IR 0,75 ISO	0,75	4,00	06	0,8	0,5	☐	○	☐	○	☐	○	☐	○	☐	○
06 IR 1,00 ISO	1,00	4,00	06	0,7	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
06 IR 1,25 ISO	1,25	4,00	06	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 0,35 ISO	0,35	5,00	08	0,7	0,4	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 0,50 ISO	0,50	5,00	08	0,6	0,5	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 0,75 ISO	0,75	5,00	08	0,6	0,5	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 1,00 ISO	1,00	5,00	08	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 1,25 ISO	1,25	5,00	08	0,6	0,7	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 1,50 ISO	1,50	5,00	08	0,6	0,7	☐	○	☐	○	☐	○	☐	○	☐	○
08 IR 1,75 ISO	1,75	5,00	08	0,6	0,8	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,35 ISO	0,35	6,35	11	0,8	0,3	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,40 ISO	0,40	6,35	11	0,8	0,4	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,45 ISO	0,45	6,35	11	0,8	0,4	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,50 ISO	0,50	6,35	11	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,60 ISO	0,60	6,35	11	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,70 ISO	0,70	6,35	11	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,75 ISO	0,75	6,35	11	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 0,80 ISO	0,80	6,35	11	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 1,00 ISO	1,00	6,35	11	0,8	0,7	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 1,25 ISO	1,25	6,35	11	0,8	0,8	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 1,50 ISO	1,50	6,35	11	0,8	1,0	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 1,75 ISO	1,75	6,35	11	0,8	1,1	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 2,00 ISO	2,00	6,35	11	0,8	0,9	☐	○	☐	○	☐	○	☐	○	☐	○
11 IR 2,50 ISO	2,50	6,35	11	0,8	1,2	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,35 ISO	0,35	9,525	16	0,8	0,3	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,40 ISO	0,40	9,525	16	0,8	0,4	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,45 ISO	0,45	9,525	16	0,8	0,4	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,50 ISO	0,50	9,525	16	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,60 ISO	0,60	9,525	16	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,70 ISO	0,70	9,525	16	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,75 ISO	0,75	9,525	16	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 0,80 ISO	0,80	9,525	16	0,6	0,6	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 1,00 ISO	1,00	9,525	16	0,6	0,7	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 1,25 ISO	1,25	9,525	16	0,8	0,9	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 1,50 ISO	1,50	9,525	16	0,8	1,0	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 1,75 ISO	1,75	9,525	16	0,9	1,2	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 2,00 ISO	2,00	9,525	16	1,0	1,3	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 2,50 ISO	2,50	9,525	16	1,1	1,5	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 3,00 ISO	3,00	9,525	16	1,1	1,5	☐	○	☐	○	☐	○	☐	○	☐	○
16 IR 3,50 ISO	3,50	9,525	16	1,2	1,7	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 3,50 ISO	3,50	12,70	22	1,6	2,3	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 4,00 ISO	4,00	12,70	22	1,6	2,3	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 4,50 ISO	4,50	12,70	22	1,6	2,4	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 5,00 ISO	5,00	12,70	22	1,6	2,3	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 5,50 ISO	5,50	12,70	22	1,6	2,3	☐	○	☐	○	☐	○	☐	○	☐	○
22 IR 6,00 ISO	6,00	12,70	22	1,6	2,4	☐	○	☐	○	☐	○	☐	○	☐	○
27 IR 5,50 ISO	5,50	15,875	27	1,6	2,3	☐	○	☐	○	☐	○	☐	○	☐	○
27 IR 6,00 ISO	6,00	15,875	27	1,8	2,5	☐	○	☐	○	☐	○	☐	○	☐	○

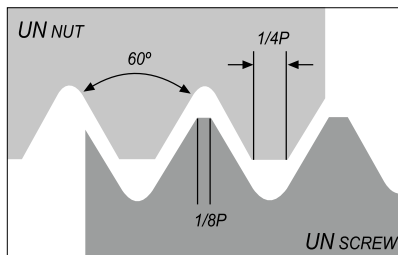
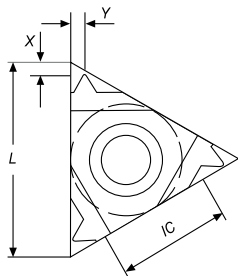
☐ Stock Items ○ Available under request

Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IL 0,50 ISO	0,50	4,00	06	0,9	0,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 0,75 ISO	0,75	4,00	06	0,8	0,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 1,00 ISO	1,00	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 1,25 ISO	1,25	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 0,50 ISO	0,50	5,00	08	0,6	0,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 0,75 ISO	0,75	5,00	08	0,6	0,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 1,00 ISO	1,00	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 1,25 ISO	1,25	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 1,50 ISO	1,50	5,00	08	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 1,75 ISO	1,75	5,00	08	0,6	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,35 ISO	0,35	6,35	11	0,8	0,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,40 ISO	0,40	6,35	11	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,45 ISO	0,45	6,35	11	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,50 ISO	0,50	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,60 ISO	0,60	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,70 ISO	0,70	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,75 ISO	0,75	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 0,80 ISO	0,80	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 1,00 ISO	1,00	6,35	11	0,8	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 1,25 ISO	1,25	6,35	11	0,8	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 1,50 ISO	1,50	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 1,75 ISO	1,75	6,35	11	0,8	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 2,00 ISO	2,00	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 2,50 ISO	2,50	6,35	11	0,8	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,35 ISO	0,35	9,525	16	0,8	0,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,40 ISO	0,40	9,525	16	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,45 ISO	0,45	9,525	16	0,8	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,50 ISO	0,50	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,60 ISO	0,60	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,70 ISO	0,70	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,75 ISO	0,75	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 0,80 ISO	0,80	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 1,00 ISO	1,00	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 1,25 ISO	1,25	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 1,50 ISO	1,50	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 1,75 ISO	1,75	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 2,00 ISO	2,00	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 2,50 ISO	2,50	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 3,00 ISO	3,00	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 3,50 ISO	3,50	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 3,50 ISO	3,50	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4,00 ISO	4,00	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4,50 ISO	4,50	12,70	22	1,6	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5,00 ISO	5,00	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5,50 ISO	5,50	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6,00 ISO	6,00	12,70	22	1,6	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 5,50 ISO	5,50	15,875	27	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 6,00 ISO	6,00	15,875	27	1,8	2,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request



AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1–1982



External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 72 UN	72	6,35	11	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 64 UN	64	6,35	11	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 56 UN	56	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 48 UN	48	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 44 UN	44	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 40 UN	40	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 36 UN	36	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 32 UN	32	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 28 UN	28	6,35	11	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 27 UN	27	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 24 UN	24	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 20 UN	20	6,35	11	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 18 UN	18	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 16 UN	16	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 ER 14 UN	14	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 72 UN	72	9,525	16	0,8	0,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 64 UN	64	9,525	16	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 56 UN	56	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 48 UN	48	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 44 UN	44	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 40 UN	40	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 36 UN	36	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 32 UN	32	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 28 UN	28	9,525	16	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 27 UN	27	9,525	16	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 24 UN	24	9,525	16	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 20 UN	20	9,525	16	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 18 UN	18	9,525	16	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 16 UN	16	9,525	16	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 14 UN	14	9,525	16	1,0	1,2	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 13 UN	13	9,525	16	1,0	1,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 12 UN	12	9,525	16	1,1	1,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 11,5 UN	11,5	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 11 UN	11	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 10 UN	10	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 9 UN	9	9,525	16	1,2	1,7	◊	○	◊	○	◊	○	◊	○	◊	○

◊ Stock Items ○ Available under request

External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 8 UN	8	9,525	16	1,2	1,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 8 UN	7	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 8 UN	6	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 8 UN	5	12,70	22	1,7	2,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 8 UN	4,5	15,875	27	1,9	2,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 ER 8 UN	4	15,875	27	2,1	3,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 72 UN	72	6,35	11	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 64 UN	64	6,35	11	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 56 UN	56	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 48 UN	48	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 44 UN	44	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 40 UN	40	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 36 UN	36	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 32 UN	32	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 28 UN	28	6,35	11	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 27 UN	27	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 24 UN	24	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 20 UN	20	6,35	11	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 18 UN	18	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 16 UN	16	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 EL 14 UN	14	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 72 UN	72	9,525	16	0,8	0,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 64 UN	64	9,525	16	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 56 UN	56	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 48 UN	48	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 44 UN	44	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 40 UN	40	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 36 UN	36	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 32 UN	32	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 28 UN	28	9,525	16	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 27 UN	27	9,525	16	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 24 UN	24	9,525	16	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 20 UN	20	9,525	16	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 18 UN	18	9,525	16	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 16 UN	16	9,525	16	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 14 UN	14	9,525	16	1,0	1,2	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 13 UN	13	9,525	16	1,0	1,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 12 UN	12	9,525	16	1,1	1,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 11,5 UN	11,5	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 11 UN	11	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 10 UN	10	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 9 UN	9	9,525	16	1,2	1,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 EL 8 UN	8	9,525	16	1,2	1,6	◊	○	◊	○	◊	○	◊	○	◊	○
22 EL 7U N	7	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
22 EL 6 UN	6	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
22 EL 5 UN	5	12,70	22	1,7	2,5	◊	○	◊	○	◊	○	◊	○	◊	○
27 EL 4,5 UN	4,5	15,875	27	1,9	2,7	◊	○	◊	○	◊	○	◊	○	◊	○
27 EL 4 UN	4	15,875	27	2,1	3,0	◊	○	◊	○	◊	○	◊	○	◊	○

◊ Stock Items ○ Available under request

Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IR 12 UN	12	9,525	16	1,1	1,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 11,5 UN	11,5	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 11 UN	11	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 10 UN	10	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 9 UN	9	9,525	16	1,2	1,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 8 UN	8	9,525	16	1,2	1,6	◊	○	◊	○	◊	○	◊	○	◊	○
22 IR 7 UN	7	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
22 IR 6 UN	6	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
22 IR 5 UN	5	12,70	22	1,6	2,3	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4,5 UN	4,5	15,875	27	1,7	2,4	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4 UN	4	15,875	27	1,8	2,7	◊	○	◊	○	◊	○	◊	○	◊	○
06 IL 32 UN	32	4,00	06	0,8	0,5	◊	○	◊	○	◊	○	◊	○	◊	○
06 IL 28 UN	28	4,00	06	0,8	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
06 IL 24 UN	24	4,00	06	0,7	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
06 IL 20 UN	20	4,00	06	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
06 IL 18 UN	18	4,00	06	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 32 UN	32	5,00	08	0,6	0,5	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 28 UN	28	5,00	08	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 24 UN	24	5,00	08	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 20 UN	20	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 18 UN	18	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 16 UN	16	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IL 14 UN	14	5,00	08	0,6	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 72 UN	72	6,35	11	0,8	0,3	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 64 UN	64	6,35	11	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 56 UN	56	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 48 UN	48	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 44 UN	44	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 40 UN	40	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 36 UN	36	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 32 UN	32	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 28 UN	28	6,35	11	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 27 UN	27	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 24 UN	24	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 20 UN	20	6,35	11	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 18 UN	18	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 16 UN	16	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 14 UN	14	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 13 UN	13	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 12 UN	12	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IL 11 UN	11	6,35	11	0,8	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 IL 72 UN	72	9,525	16	0,8	0,3	◊	○	◊	○	◊	○	◊	○	◊	○
16 IL 64 UN	64	9,525	16	0,8	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IL 56 UN	56	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IL 48 UN	48	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 IL 44 UN	44	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○

◊ Stock Items ○ Available under request

Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IL 40 UN	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 36 UN	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 32 UN	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 28 UN	28	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 27 UN	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 24 UN	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 20 UN	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 18 UN	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 UN	16	9,525	16	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 UN	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 13 UN	13	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 UN	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11,5 UN	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11 UN	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 UN	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 9 UN	9	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 UN	8	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 7 UN	7	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 UN	6	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5 UN	5	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4,5 UN	4,5	15,875	27	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4 UN	4	15,875	27	1,8	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 8 W	8	9,525	16	1,2	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 7 W	7	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6 W	6	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5 W	5	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 4,5 W	4,5	15,875	27	1,8	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 4 W	4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 72 W	72	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 60 W	60	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 56 W	56	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 48 W	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 40 W	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 36 W	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 32 W	32	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 28 W	28	6,35	11	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 26 W	26	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 24 W	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 22 W	22	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 20 W	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 19 W	19	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 18 W	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 16 W	16	6,35	11	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 14 W	14	6,35	11	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 72 W	72	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 60 W	60	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 56 W	56	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 48 W	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 40 W	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 36 W	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 32 W	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 28 W	28	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 26 W	26	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 24 W	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 22 W	22	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 20 W	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 19 W	19	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 18 W	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 16 W	16	9,525	16	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 W	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 12 W	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 11 W	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 W	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 9 W	9	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 W	8	9,525	16	1,2	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 7 W	7	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6 W	6	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5 W	5	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 4,5 W	4,5	15,875	27	1,8	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 4 W	4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR 26 W	26	4,00	06	0,7	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
06 IR 22 W	22	4,00	06	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
06 IR 20 W	20	4,00	06	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
06 IR 18 W	18	4,00	06	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 28 W	28	5,00	08	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 24 W	24	5,00	08	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 20 W	20	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 19 W	19	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 18 W	18	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
08 IR 16 W	16	5,00	08	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 72 W	72	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 60 W	60	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 56 W	56	6,35	11	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 48 W	48	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 40 W	40	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 36 W	26	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 32 W	23	6,35	11	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 28 W	28	6,35	11	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 26 W	26	6,35	11	0,7	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 24 W	24	6,35	11	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 22 W	22	6,35	11	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 20 W	20	6,35	11	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 19 W	19	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 18 W	18	6,35	11	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 16 W	16	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 14 W	14	6,35	11	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 12 W	12	6,35	11	1,0	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
11 IR 11 W	11	6,35	11	0,9	1,2	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 72 W	72	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 60 W	60	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 56 W	56	9,525	16	0,7	0,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 48 W	48	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 40 W	40	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 36 W	36	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 32 W	32	9,525	16	0,6	0,6	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 28 W	28	9,525	16	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 26 W	26	9,525	16	0,6	0,7	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 24 W	24	9,525	16	0,7	0,8	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 22 W	22	9,525	16	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 20 W	20	9,525	16	0,8	0,9	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 19 W	19	9,525	16	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 18 W	18	9,525	16	0,8	1,0	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 16 W	16	9,525	16	0,9	1,1	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 14 W	14	9,525	16	1,0	1,2	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 12 W	12	9,525	16	1,1	1,4	◊	○	◊	○	◊	○	◊	○	◊	○
16 IR 11 W	11	9,525	16	1,1	1,5	◊	○	◊	○	◊	○	◊	○	◊	○

◊ Stock Items ○ Available under request

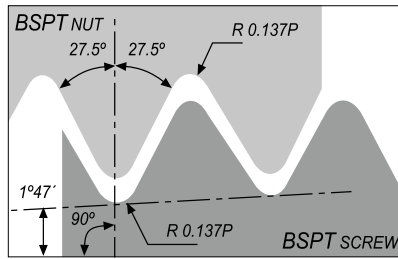
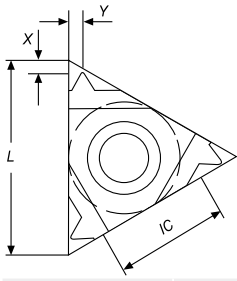
Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IR 10 W	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 9 W	9	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 W	8	9,525	16	1,2	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 7 W	7	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6 W	6	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5 W	5	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 4,5 W	4,5	15,875	27	1,8	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 4 W	4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 26 W	26	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 22 W	22	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 20 W	20	4,00	06	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 18 W	18	4,00	06	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 28 W	28	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 24 W	24	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 20 W	20	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 19 W	19	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 18 W	18	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 16 W	16	5,00	08	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 72 W	72	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 60 W	60	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 56 W	56	6,35	11	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 48 W	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 40 W	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 36 W	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 32 W	32	6,35	11	0,	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 28 W	28	6,35	11	0,	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 26 W	26	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 24 W	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 22 W	22	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 20 W	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 19 W	19	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 18 W	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 16 W	16	6,35	11	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 14 W	14	6,35	11	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 12 W	12	6,35	11	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 11 W	11	6,35	11	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 72 W	72	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 60 W	60	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 56 W	56	9,525	16	0,7	0,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 48 W	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IL 40 W	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 36 W	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 32 W	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 28 W	28	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 26 W	26	9,525	16	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 24 W	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 22 W	22	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 20 W	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 19 W	19	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 18 W	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 W	16	9,525	16	0,9	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 W	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 W	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11 W	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 W	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 9 W	9	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 W	8	9,525	16	1,2	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 7 W	7	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 W	6	12,70	22	1,6	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5 W	5	12,70	22	1,7	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4,5 W	4,5	15,875	27	1,8	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4 W	4	15,875	27	2,0	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

BSPT | B.S.21: 1985

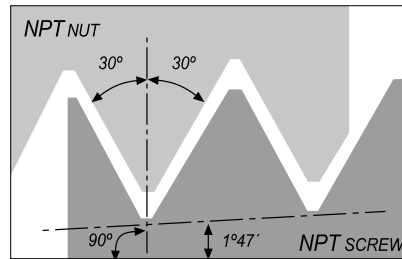
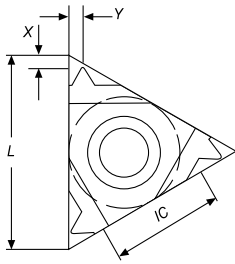


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 28 BSPT	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 19 BSPT	19	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 BSPT	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 11 BSPT	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 28 BSPT	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 19 BSPT	19	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 BSPT	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 11 BSPT	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR 28 BSPT	28	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 28 BSPT	28	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 19 BSPT	19	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 28 BSPT	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 19 BSPT	19	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 14 BSPT	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 11 BSPT	11	6,35	11	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 28 BSPT	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 19 BSPT	19	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 BSPT	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 11 BSPT	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 28 BSPT	28	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 28 BSPT	28	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 19 BSPT	19	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 28 BSPT	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 19 BSPT	19	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 14 BSPT	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 11 BSPT	11	9,525	11	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 28 BSPT	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 19 BSPT	19	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 BSPT	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11 BSPT	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

NPT | ANSI/ASME B 1.20.1-1983

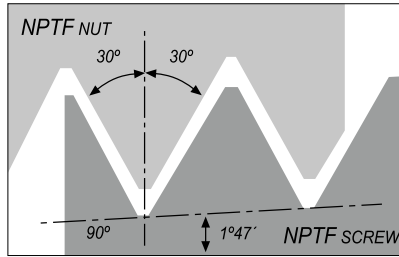
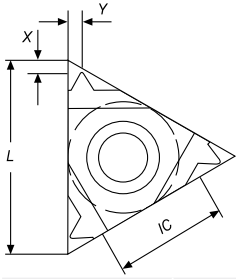


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 27 NPT	27	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 18 NPT	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 14 NPT	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 27 NPT	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 18 NPT	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 NPT	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 11,5 NPT	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 NPT	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 27 NPT	27	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 18 NPT	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 14 NPT	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 27 NPT	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 18 NPT	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 NPT	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 11,5 NPT	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 NPT	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR 27 NPT	27	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 27 NPT	27	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 18 NPT	18	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 27 NPT	27	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 18 NPT	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 14 NPT	14	9,525	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 27 NPT	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 18 NPT	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 NPT	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 11,5 NPT	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 NPT	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 27 NPT	27	4,00	06	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 27 NPT	27	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 18 NPT	18	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 27 NPT	27	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 18 NPT	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 14 NPT	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 27 NPT	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 18 NPT	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 NPT	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11,5 NPT	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 NPT	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

NPTF | ANSI B 1.20.3-1976

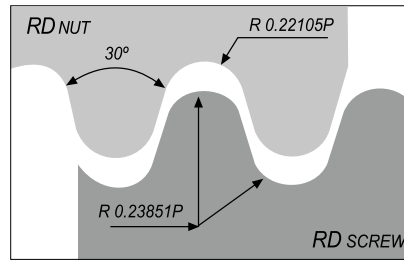
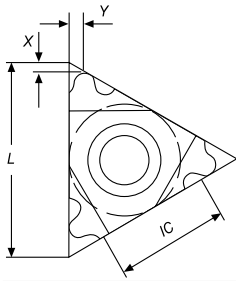


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 27 NPTF	27	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 18 NPTF	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 14 NPTF	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 27 NPTF	27	9,525	16	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 18 NPTF	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 NPTF	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 11,5 NPTF	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 NPTF	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 27 NPTF	27	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 18 NPTF	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 14 NPTF	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 27 NPTF	27	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 18 NPTF	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 NPTF	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 11,5 NPTF	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 NPTF	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
06 IR 27 NPTF	27	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 18 NPTF	18	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 14 NPTF	14	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 27 NPTF	27	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 18 NPTF	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 14 NPTF	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 27 NPTF	27	9,525	16	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 18 NPTF	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 NPTF	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 11,5 NPTF	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 NPTF	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
06 IL 27 NPTF	27	4,00	06	0,7	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 18 NPTF	18	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 14 NPTF	14	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 27 NPTF	27	6,35	11	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 18 NPTF	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 14 NPTF	14	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 27 NPTF	27	9,525	16	0,7	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 18 NPTF	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 NPTF	14	9,525	16	0,9	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11,5 NPTF	11,5	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 NPTF	8	9,525	16	1,3	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

ROUND (DIN 405) | DIN 405:1997

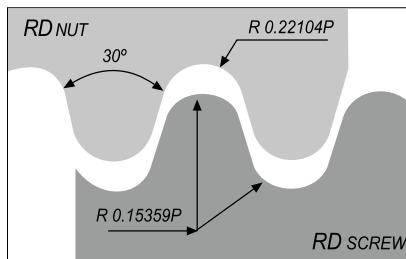
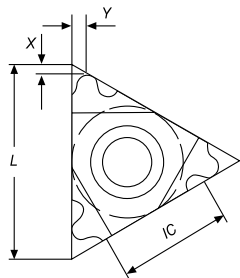


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 10 RD	10	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 RD	8	9,525	16	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 6 RD	6	9,525	16	1,4	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6 RD	6	12,70	22	1,5	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4 RD	4	12,70	22	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 4 RD	4	15,875	27	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 RD	10	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 RD	8	9,525	16	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 6 RD	6	9,525	16	1,4	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6 RD	6	12,70	22	1,5	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4 RD	4	12,70	22	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 4 RD	4	15,875	27	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IR 10 RD	10	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 RD	8	9,525	16	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 6 RD	6	9,525	16	1,4	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6 RD	6	12,70	22	1,5	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 4 RD	4	12,70	22	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 4 RD	4	15,875	27	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 RD	10	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 RD	8	9,525	16	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 6 RD	6	9,525	16	1,4	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 RD	6	12,70	22	1,5	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4 RD	4	12,70	22	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4 RD	4	1,875	27	2,2	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

ROUND (DIN 20400) | DIN 20400:1990

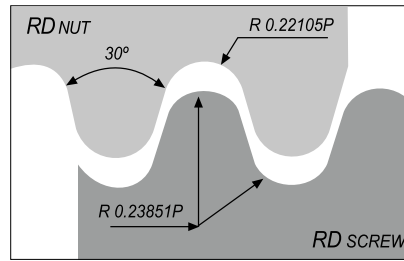
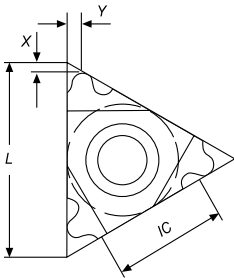


External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 ER 4,0 RD20400	4,0	12,70	22	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5,0 RD20400	5,0	12,70	22	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5,0 RD20400	6,0	12,70	22	1,7	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4,0 RD20400	4,0	12,70	22	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5,0 RD20400	5,0	12,70	22	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6,0 RD20400	6,0	12,70	22	1,7	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 IR 4,0 RD20400	4,0	12,70	22	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5,0 RD20400	5,0	12,70	22	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6,0 RD20400	6,0	12,70	22	1,7	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4,0 RD20400	4,0	12,70	22	1,4	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5,0 RD20400	5,0	12,70	22	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6,0 RD20400	6,0	12,70	22	1,7	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

TRAPEZ | DIN 103:1977 | ISO 2901:1993

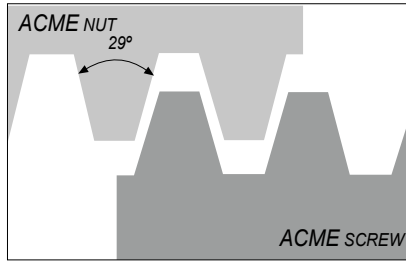
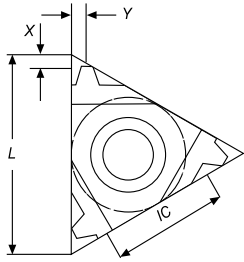


External Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 1,5 TR	1,5	9,525	16	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 2,0 TR	2,0	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 3,0 TR	3,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 4,0 TR	4,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4,0 TR	4,0	12,70	22	1,8	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5,0 TR	5,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6,0 TR	6,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 6,0 TR	6,0	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 7,0 TR	7,0	15,875	27	2,2	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 1,5 TR	1,5	9,525	16	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 2,0 TR	2,0	9,525	16	1,1	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 3,0 TR	3,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 4,0 TR	4,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4,0 TR	4,0	12,70	22	1,8	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5,0 TR	5,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6,0 TR	6,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 6,0 TR	6,0	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 7,0 TR	7,0	15,875	27	2,2	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch MM	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
08 IR 1,5 TR	1,5	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 1,5 TR	1,5	9,525	16	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 2,0 TR	2,0	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 3,0 TR	3,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 4,0 TR	4,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 4,0 TR	4,0	12,70	22	1,8	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5,0 TR	5,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6,0 TR	6,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 6,0 TR	6,0	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 7,0 TR	7,0	15,875	27	2,2	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 1,5 TR	1,5	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 2,0 TR	2,0	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 3,0 TR	3,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 4,0 TR	4,0	9,525	16	1,3	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4,0 TR	4,0	12,70	22	1,8	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5,0 TR	5,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6,0 TR	6,0	12,70	22	2,0	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 6,0 TR	6,0	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 7,0 TR	7,0	15,875	27	2,2	2,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

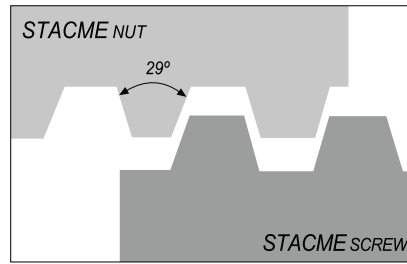
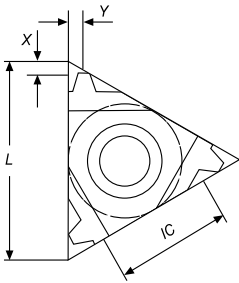
⊕ Stock Items ○ Available under request

AMERICAN ACME | ANSI/ASME: 1.5–1988



External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 16 ACME	16	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 16 ACME	16	9,525	16	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 ACME	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 12 ACME	12	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 10 ACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 ACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 6 ACME	6	9,525	16	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6 ACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5 ACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4 ACME	4	12,70	22	2,1	2,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 4 ACME	4	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 16 ACME	16	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 16 ACME	16	9,525	16	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 ACME	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 12 ACME	12	9,525	16	1,1	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 ACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 ACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 6 ACME	6	9,525	16	1,7	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6 ACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5 ACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4 ACME	4	12,70	22	2,1	2,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 4 ACME	4	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IR 16 ACME	16	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 16 ACME	16	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 16 ACME	16	9,525	0,9	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 ACME	14	9,525	1,0	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 12 ACME	12	9,525	1,1	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 10 ACME	10	9,525	1,3	1,3	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 ACME	8	9,525	1,5	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 6 ACME	6	9,525	1,7	1,8	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6 ACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5 ACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 4 ACME	4	12,70	22	2,1	2,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 4 ACME	4	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 16 ACME	16	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 16 ACME	16	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 ACME	16	9,525	0,9	1,0	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 ACME	14	9,525	1,0	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 ACME	12	9,525	1,1	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 ACME	10	9,525	1,3	1,3	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 ACME	8	9,525	1,5	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 6 ACME	6	9,525	1,7	1,8	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 ACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5 ACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4 ACME	4	12,70	22	2,1	2,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4 ACME	4	15,875	27	2,3	2,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

STUB ACME | ANSI/ASME: 1.8-1988



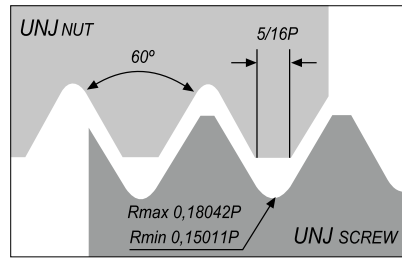
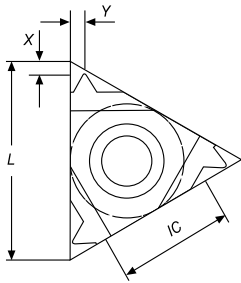
External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 16 STACME	16	6,35	11	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 16 STACME	16	9,525	16	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 STACME	14	9,525	16	1,1	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 12 STACME	12	9,525	16	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 10 STACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 STACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 6 STACME	6	9,525	16	1,8	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6 STACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5 STACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4 STACME	4	12,70	22	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 4 STACME	4	15,875	27	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 ER 3 STACME	3	15,875	27	2,8	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 16 STACME	16	6,35	11	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 16 STACME	16	9,525	16	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 STACME	14	9,525	16	1,1	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 12 STACME	12	9,525	16	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 STACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 STACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 6 STACME	6	9,525	16	1,8	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6 STACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 5 STACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4 STACME	4	12,70	22	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 4 STACME	4	15,875	27	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 EL 3 STACME	3	15,875	27	2,8	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
08 IR 16 STACME	16	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 16 STACME	16	9,525	16	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 STACME	14	9,525	16	1,1	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 12 STACME	12	9,525	16	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 10 STACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 STACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 6 STACME	6	9,525	16	1,8	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6 STACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5 STACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 4 STACME	4	12,70	22	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 4 STACME	4	15,875	27	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IR 3 STACME	3	15,875	27	2,8	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
08 IL 16 STACME	16	5,00	08	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 STACME	16	9,525	16	1,0	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 STACME	14	9,525	16	1,1	1,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 STACME	12	9,525	16	1,2	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 STACME	10	9,525	16	1,3	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 STACME	8	9,525	16	1,5	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 6 STACME	6	9,525	16	1,8	1,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 STACME	6	12,70	22	1,8	2,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 5 STACME	5	12,70	22	2,0	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4 STACME	4	12,70	22	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 4 STACME	4	15,875	27	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
27 IL 3 STACME	3	15,875	27	2,8	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

UNJ | MIL-S-8879A



External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 48 UNJ	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 44 UNJ	44	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 40 UNJ	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 36 UNJ	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 32 UNJ	32	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 28 UNJ	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 24 UNJ	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 20 UNJ	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 18 UNJ	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 16 UNJ	16	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 14 UNJ	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 48 UNJ	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 44 UNJ	44	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 40 UNJ	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 36 UNJ	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 32 UNJ	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 28 UNJ	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 24 UNJ	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 20 UNJ	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 18 UNJ	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 16 UNJ	16	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 14 UNJ	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 13 UNJ	13	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 12 UNJ	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 11 UNJ	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 10 UNJ	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 9 UNJ	9	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 UNJ	8	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 48 UNJ	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 44 UNJ	44	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 40 UNJ	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 36 UNJ	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 32 UNJ	32	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 28 UNJ	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 24 UNJ	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 20 UNJ	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request



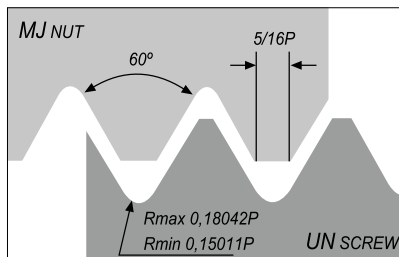
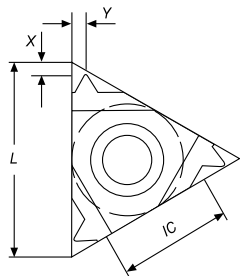
External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 EL 18 UNJ	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 16 UNJ	16	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 14 UNJ	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 48 UNJ	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 44 UNJ	44	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 40 UNJ	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 36 UNJ	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 32 UNJ	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 28 UNJ	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 24 UNJ	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 20 UNJ	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 18 UNJ	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 16 UNJ	16	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 14 UNJ	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 13 UNJ	13	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 12 UNJ	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 11 UNJ	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 UNJ	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 9 UNJ	9	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 8 UNJ	8	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 IR 48 UNJ	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 44 UNJ	44	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 40 UNJ	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 36 UNJ	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 32 UNJ	32	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 28 UNJ	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 24 UNJ	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 20 UNJ	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 18 UNJ	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 16 UNJ	16	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 14 UNJ	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 48 UNJ	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 44 UNJ	44	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 40 UNJ	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 36 UNJ	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 32 UNJ	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 28 UNJ	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 24 UNJ	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 20 UNJ	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 18 UNJ	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 16 UNJ	16	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 14 UNJ	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 13 UNJ	13	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 12 UNJ	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 11 UNJ	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 10 UNJ	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 9 UNJ	9	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 UNJ	8	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 48 UNJ	48	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 44 UNJ	44	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 40 UNJ	40	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 36 UNJ	36	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 32 UNJ	32	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 28 UNJ	28	6,35	11	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 24 UNJ	24	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 20 UNJ	20	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 18 UNJ	18	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 16 UNJ	16	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 14 UNJ	14	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 48 UNJ	48	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 44 UNJ	44	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 40 UNJ	40	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 36 UNJ	36	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 32 UNJ	32	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 28 UNJ	28	9,525	16	0,6	0,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 24 UNJ	24	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 20 UNJ	20	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 18 UNJ	18	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 UNJ	16	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 14 UNJ	14	9,525	16	1,0	1,2	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 13 UNJ	13	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 UNJ	12	9,525	16	1,1	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 11 UNJ	11	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 UNJ	10	9,525	16	1,1	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 9 UNJ	9	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 8 UNJ	8	9,525	16	1,2	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

MJ | ISO 5855-1:1989

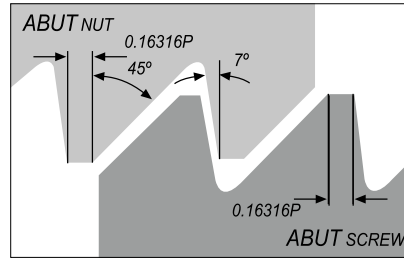
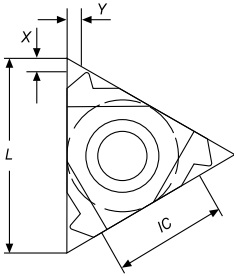


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 1,0 MJ	1,0	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,25 MJ	1,25	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 1,5 MJ	1,5	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 2,0 MJ	2,0	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 IR 1,0 MJ	1,0	6,35	11	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 1,25 MJ	1,25	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 1,5 MJ	1,5	6,35	11	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 2,0 MJ	2,0	6,35	11	0,9	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 1,0 MJ	1,0	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 1,25 MJ	1,25	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 1,5 MJ	1,5	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 2,0 MJ	2,0	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

AMERICAN BUTTRESS | ANSI B1.9-1973

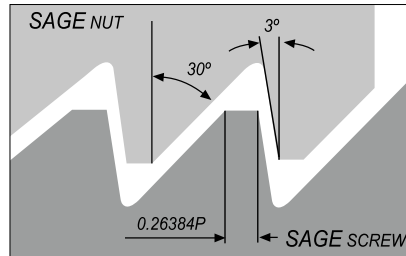
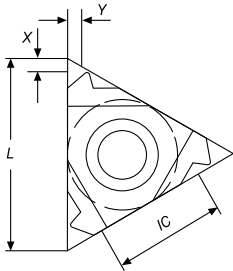


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 ER 20 ABUT	20	6,35	11	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 ER 16 ABUT	16	6,35	11	1,0	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 20 ABUT	20	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 16 ABUT	16	9,525	16	1,0	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 12 ABUT	12	9,525	16	1,4	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 10 ABUT	10	9,525	16	1,5	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 8 ABUT	8	12,70	22	2,1	3,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 6 ABUT	6	12,70	22	2,1	3,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 20 ABUT	20	6,35	11	1,0	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 EL 16 ABUT	16	6,35	11	1,1	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 20 ABUT	20	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 16 ABUT	16	9,525	16	1,0	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 12 ABUT	12	9,525	16	1,4	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 10 ABUT	10	9,525	16	1,5	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 8 ABUT	8	12,70	22	2,1	3,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 6 ABUT	6	12,70	22	2,1	3,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
11 IR 20 ABUT	20	6,35	11	1,0	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 16 ABUT	16	6,35	11	1,1	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 20 ABUT	20	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 16 ABUT	16	9,525	16	1,0	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 12 ABUT	12	9,525	16	1,4	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 10 ABUT	10	9,525	16	1,5	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 8 ABUT	8	12,70	22	2,1	3,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 6 ABUT	6	12,70	22	2,1	3,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 20 ABUT	20	6,35	11	1,0	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IL 16 ABUT	16	6,35	11	1,1	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 20 ABUT	20	9,525	16	1,0	1,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 16 ABUT	16	9,525	16	1,0	1,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 12 ABUT	12	9,525	16	1,4	2,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 10 ABUT	10	9,525	16	1,5	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 8 ABUT	8	12,70	22	2,1	3,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 6 ABUT	6	12,70	22	2,1	3,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

METRIC BUTTRESS SAGENGWINDE (DIN 513:1985) SAW THREAD

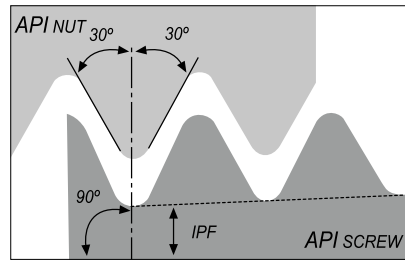
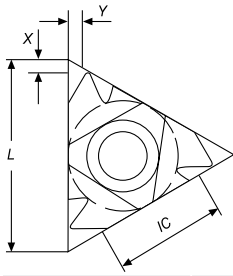


External Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 2,0 SAGE	2,0	9,525	16	1,1	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 3,0 SAGE	3,0	12,70	22	1,5	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 4,0 SAGE	4,0	12,70	22	1,9	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 EL 2,0 SAGE	2,0	9,525	16	1,1	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 3,0 SAGE	3,0	12,70	22	1,5	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 EL 4,0 SAGE	4,0	12,70	22	1,9	3,1	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Dimensions (mm)				P		M		K		N		S	
		IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IR 2,0 SAGE	2,0	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 3,0 SAGE	3,0	12,70	22	1,9	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 4,0 SAGE	4,0	12,70	22	2,3	3,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IL 2,0 SAGE	2,0	9,525	16	1,2	1,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 3,0 SAGE	3,0	12,70	22	1,9	2,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IL 4,0 SAGE	4,0	12,70	22	2,3	3,5	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

API | API SPEC 7:2001 (0.040 | 0.038r | 0.050)



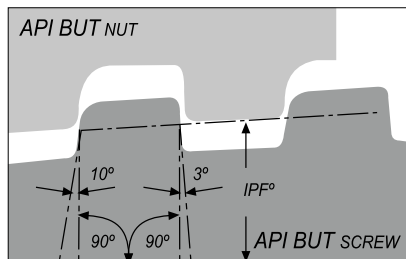
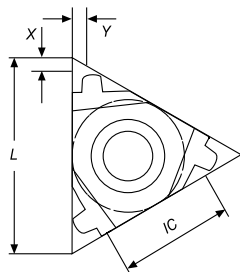
External Reference	Pitch TPI	Taper IPF	Thread	Size	Dimensions (mm)				P		M		K		N		S	
					IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 ER 5,00 API 403	5	3	V-0,040	2 3/8" — 4 1/2" REG	12,70	22	1,8	2,5	◊	○	◊	○	◊	○	◊	○	◊	○
22 ER 4,00 API 382	4	2	V-0,038R	NC23-NC50	12,70	22	2,0	2,6	◊	○	◊	○	◊	○	◊	○	◊	○
22 ER 4,00 API 502	4	2	V-0,050	6 5/8" REG	12,70	22	1,9	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 ER 5,00 API 403	5	3	V-0,040	2 3/8" — 4 1/2" REG	15,875	27	1,9	2,7	◊	○	◊	○	◊	○	◊	○	◊	○
27 ER 4,00 API 382	4	2	V-0,038R	NC23-NC50	15,875	27	2,1	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 ER 4,00 API 383	4	3	V-0,038R	NC56-NC77	15,875	27	2,1	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 ER 4,00 API 502	4	2	V-0,050	6 5/8" REG	15,875	27	2,0	3,0	◊	○	◊	○	◊	○	◊	○	◊	○
27 ER 4,00 API 503	4	3	V-0,050	5 1/2", 7 5/8", 8 5/8" REG	15,875	27	2,0	3,0	◊	○	◊	○	◊	○	◊	○	◊	○

Internal Reference	Pitch TPI	Taper IPF	Thread	Size	Dimensions (mm)				P		M		K		N		S	
					IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 IR 5,00 API 403	5	3	V-0,040	2 3/8" — 4 1/2" REG	12,70	22	1,8	2,5	◊	○	◊	○	◊	○	◊	○	◊	○
22 IR 4,00 API 382	4	2	V-0,038R	NC23-NC50	12,70	22	2,0	2,6	◊	○	◊	○	◊	○	◊	○	◊	○
22 IR 4,00 API 502	4	2	V-0,050	6 5/8" REG	12,70	22	1,9	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 5,00 API 403	5	3	V-0,040	2 3/8" — 4 1/2" REG	15,875	27	1,9	2,7	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4,00 API 382	4	2	V-0,038R	NC23-NC50	15,875	27	2,1	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4,00 API 383	4	3	V-0,038R	NC56-NC77	15,875	27	2,1	2,8	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4,00 API 502	4	2	V-0,050	6 5/8" REG	15,875	27	2,0	3,0	◊	○	◊	○	◊	○	◊	○	◊	○
27 IR 4,00 API 503	4	3	V-0,050	5 1/2", 7 5/8", 8 5/8" REG	15,875	27	2,0	3,0	◊	○	◊	○	◊	○	◊	○	◊	○

◊ Stock Items ○ Available under request



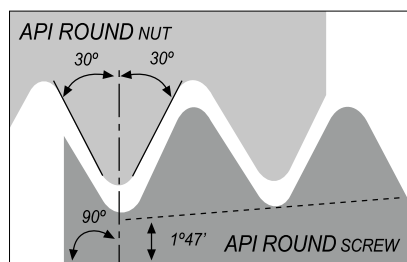
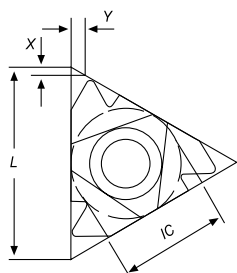
API | buttress casing | api spec 5b:2008 | oil threads



External Reference	Pitch TPI	Taper IPF	Size	Dimensions (mm)				P		M		K		N		S	
				IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 ER 5 BUT 0,75	5	0,75	12,70	22	4 1/2" — 13 3/8"	2,2	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5 BUT 1,00	5	1,00	12,70	22	16" — 20"	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Taper IPF	Size	Dimensions (mm)				P		M		K		N		S	
				IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
22 IR 5 BUT 0,75	5	0,75	12,70	22	4 1/2" — 13 3/8"	2,2	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5 BUT 1,00	5	1,00	12,70	22	16" — 20"	2,3	2,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

API Round Casing & Tubing | API SPEC 5B:2008

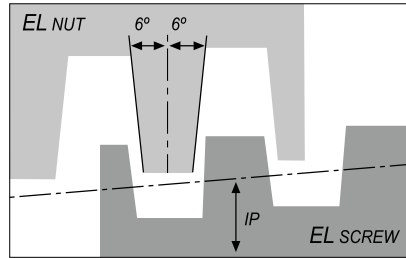
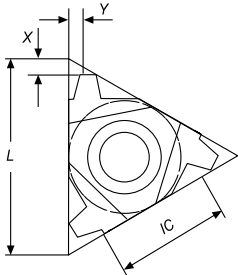


External Reference	Pitch TPI	Taper IPF	Dimensions (mm)				P		M		K		N		S	
			IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 ER 10 API RD	10	0,75	9,525	16	1,5	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 8 API RD	8	0,75	9,525	16	1,3	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch TPI	Taper IPF	Dimensions (mm)				P		M		K		N		S	
			IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20	EN20
16 IR 10 API RD	10	0,75	9,525	16	1,5	1,4	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 8 API RD	8	0,75	9,525	16	1,3	1,6	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

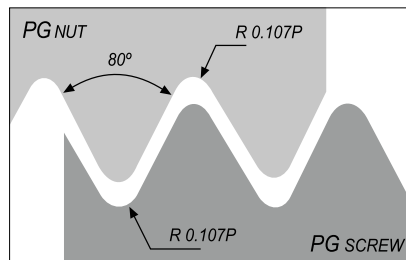
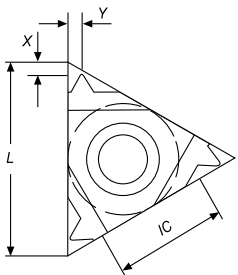
EXTREME LINE CASING | API SPEC 5B:2008 — OIL THREADS



External Reference	Pitch	Taper	Size	Dimensions (mm)				P		M		K		Z		S	
				TPI	IPF	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20
22 ER 6 EL 1,5	6	1,5	12,70	22	5" — 7 5/8"	1,9	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 ER 5 EL 1,25	5	1,25	12,70	22	8 5/8" — 10 3/4"	2,4	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch	Taper	Size	Dimensions (mm)				P		M		K		Z		S	
				TPI	IPF	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20
22 IR 6 EL 1,5	6	1,5	12,70	22	5" — 7 5/8"	1,9	1,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
22 IR 5 EL 1,25	5	1,25	12,70	22	8 5/8" — 10 3/4"	2,4	2,3	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

PG | DIN 40430; 1971



External Reference	Pitch	Size	Dimensions (mm)				P		M		K		Z		S	
			TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20
16 ER 20 PG	20	PG7	9,525	16	0,7	0,8	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 18 PG	18	PG9, PG11, PG13,5, PG16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 ER 16 PG	16	PG21, PG29, PG36, PG42, PG48	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

Internal Reference	Pitch	Size	Dimensions (mm)				P		M		K		Z		S	
			TPI	IC	L	X	Y	SXN20	EN20	SXN20	EN20	SXN20	EN20	ZN10	SXN20	SXN20
08 IR 20 PG	20	PG7	5,0	8	0,6	0,7	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
11 IR 18 PG	18	PG9, PG11, PG13,5, PG16	6,35	11	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 18 PG	18	PG9, PG11, PG13,5, PG16	9,525	16	0,8	0,9	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○
16 IR 16 PG	16	PG21, PG29, PG36, PG42, PG48	9,525	16	0,8	1,0	⊕	○	⊕	○	⊕	○	⊕	○	⊕	○

⊕ Stock Items ○ Available under request

Grades description

SXN20	(P10-P35) (M10-M25) (K10-K30) (N05-N15) (S10-S30)	An advance PVD TiAlN coated grade over a tough wear-resistant submicron substrate for general purpose machining of steel, stainless steel, superalloys.
EN20	(P10-P35) (M10-M25) (K10-K30) (N05-N15) (S10-S30)	An advance PVD TiAlN+TiN coated grade over a tough wear-resistant submicron substrate for general purpose machining of steel, stainless steel, superalloys.

Order code information

The order code is the combination between the geometry code of the insert plus the code of the grade.






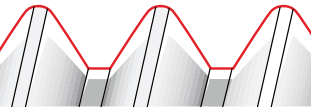
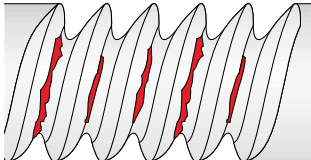
— E.g. 2120035 (16IR 14W) + 68 (SXN20) = 212003568

Geometry Code + Grade Code = Order Code

Recommended grades and cutting speeds (m/min)

ISO	Material	Hardness HB	Coated SXN20 Cutting Speed m/min	Coated EN20 Cutting Speed m/min
P	UNALLOYED STEEL	130	120–200	120–200
	LOW-ALLOYED STEEL	200	110–180	110–180
	HIGH-ALLOY STEEL	240	100–170	100–170
	STEEL CASTINGS	270	70–120	70–120
	HEAT TREATED STEEL	400	50–90	50–90
M	300 STAINLESS STEEL: (303,304,316)	200	70–140	70–140
	400 STAINLESS STEEL: (420,440)	240	80–120	80–120
	17–4 PH, 15–5 PH, 13–8MO PH	400	50–110	50–110
K	GREY CAST IRON	190	70–150	70–150
	NODULAR CAST IRON	180	100–140	100–140
	MALLEABLE CAST IRON	240	90–150	90–150
N	WROUGHT ALUMINIUM: (2024, 6061, 7075...)	80	100–400	100–400
	CAST ALUMINIUM:	90	150–400	150–400
	COPPER & COPPER:BRASS, BRONZE, COPPER SILICON	100	80–180	80–180
	NON METALIC:Rubber, polypropylene, Thermoplastics (PVC), Thermoplastics Plastics (FIBERGLASS), Polyamides	—	200–500	200–500
S	TITANIUM:	—	—	—
	PURE TITANIUM: 99,0Ti	—	100–150	100–150
	ALPHA ALLOYS: Ti5Al2.5Sn	—	40–60	40–60
	BETA ALLOYS: Ti 13V11Cr3Al	—	30–50	30–50
	ALPHA - BETA ALLOYS: Ti 6Al4V	—	30–50	30–50
	COBALT BASE ALLOYS: STELLITE	—	20–40	20–40
	NIKEL BASE ALLOYS:INCONEL, HASTELLOY,WASPALLOY, KOVAR	—	20–40	20–40
	HIGH TEMPERATURE ALLOYS:IRON BASED: INCOLOY	—	30–60	30–60
H	HARDENED STEEL	50 HRc	30–50	30–50
	HARDENED CAST IRON	50 HRc	25–35	25–35

Grades description

Problem	Possible Cause	Solution
Increased flank wear 	<ol style="list-style-type: none"> 1. Cutting speed too high. 2. Depth of cut too low / too many passes. 3. Unsuitable carbide grade. 4. Insufficient cooling. 	<ol style="list-style-type: none"> 1. Reduce cutting speed / Use coated insert. 2. Increase the depth of cut per pass. 3. Use a coated carbide grade. 4. Increase coolant flow rate.
Uneven cutting edge wear 	<ol style="list-style-type: none"> 1. Incorrect helix angle. 2. Wrong infeed method. 	<ol style="list-style-type: none"> 1. Choose the correct anvil. 2. Use the Alternating Flank Infeed method.
Extreme plastic deformation 	<ol style="list-style-type: none"> 1. Depth of cut too large. 2. Insufficient cooling. 3. Cutting speed too high. 4. Unsuitable carbide grade. 5. Nose radius too small. 	<ol style="list-style-type: none"> 1. Decrease depth of cut / Increase number of passes. 2. Increase coolant flow rate. 3. Reduce cutting speed. 4. Use a tougher carbide. 5. Use an insert with a larger radius, if possible.
Cutting edge breakage 	<ol style="list-style-type: none"> 1. Depth of cut too large. 2. Extreme plastic deformation. 3. Insufficient cooling. 4. Unsuitable carbide grade. 5. Instability. 	<ol style="list-style-type: none"> 1. Decrease depth of cut / Increase number of passes. 2. Use a tougher carbide. 3. Increase flow rate and / or correct flow direction. 4. Use a tougher carbide. 5. Check stability of the system.
Built-up edge 	<ol style="list-style-type: none"> 1. Incorrect cutting speed. 2. Unsuitable carbide grade. 	<ol style="list-style-type: none"> 1. Change the cutting speed. 2. Use a coated carbide.
Thread profile is too shallow 	<ol style="list-style-type: none"> 1. The tool is not at the workpiece axis height. 2. Insert is not machining the thread crest. 3. Worn insert. 	<ol style="list-style-type: none"> 1. Change tool height. 2. Measure the workpiece diameter. 3. Change the cutting edge sooner.
Thread profile is too shallow 	<ol style="list-style-type: none"> 1. Cutting speed too low. 2. Wrong anvil. 3. Flank infeed method is not appropriate. 	<ol style="list-style-type: none"> 1. Increase cutting speed. 2. Choose correct anvil. 3. Use the alternate flank or radial infeed method.

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