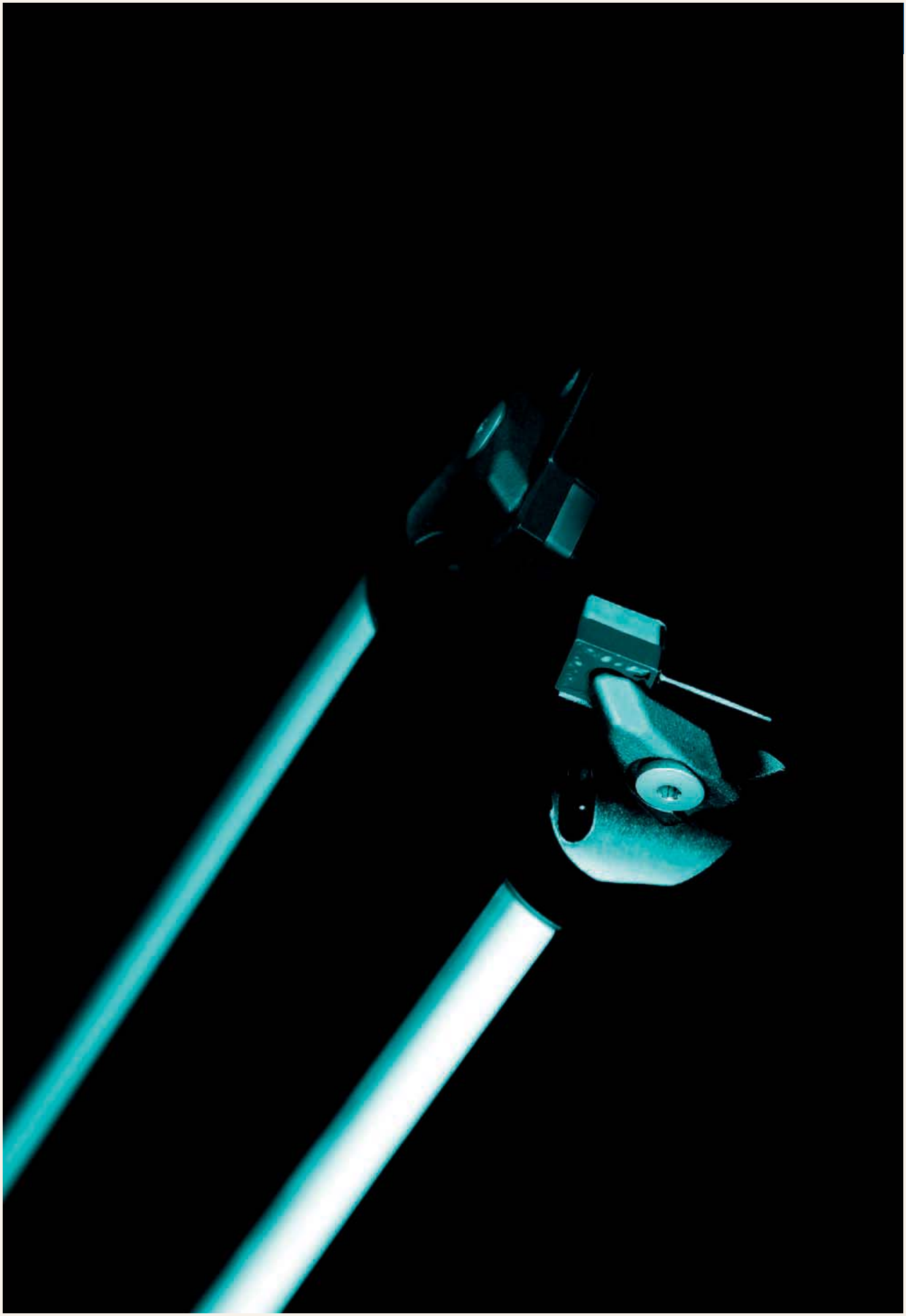
2015

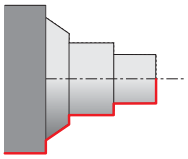
TURNING



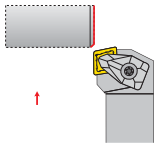
ALPHANUMERIC INDEX - TOOLHOLDERS

ALPHANUMERIC INDEX - INSERTS

TURNING - EXTERNAL
SHORT AND STABLE COMPONENTS (negatively clamped inserts)



DCKNR/L
75°

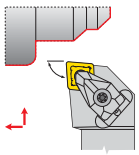


CN..
4

■ 1.000 x 1.000

T16 | T91 – T94

DCLNR/L
95°

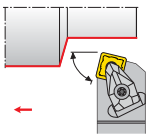


CN..
3
4
5
6
8

■ .625 x .625 / 1.500 x 1.500

T17 | T91 – T94

DCRNR/L
75°

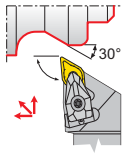


CN..
4
5
6

■ .750 x .750 / 1.500 x 1.500

T18 | T91 – T94

DDJNR/L
93°

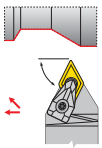


DN..
3
4

■ .750 x .750 / 1.250 x 1.250

T19 | T97 – T100

DDPNR/L
62°30´

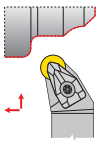


DN..
3
4

■ .750 x .750 / 1.000 x 1.000

T20 | T97 – T100

DRSNR/L

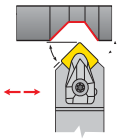


RN..
4

■ 1.000 x 1.000

T21 | T105

DSDNR/L
45°

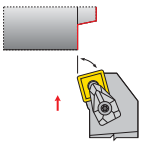


SN..
4
5
6
8

■ .750 x .750 / 1.500 x 1.500

T22 | T108 – T110

DSKNR/L
75°

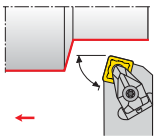


SN..
4
5

■ 1.000 x 1.000 / 1.250 x 1.250

T23 | T108 – T110

DSRNR/L
75°

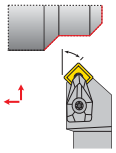


SN..
4
5
6
8

■ .750 x .750 / 1.500 x 1.500

T24 | T184 – T188

DSSNR/L
45°

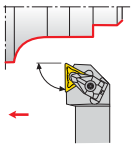


SN..
4
5
6

■ .750 x .750 / 1.500 x 1.500

T25 | T184 – T188

DTGNR/L
90°

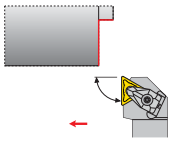


TN..
3
4
5

■ .750 x .750 / 1.500 x 1.500

T26 | T115 – T118

DTJNR/L
93°

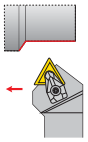


TN..
3
4

■ .750 x .750 / 1.250 x 1.250

T27 | T115 – T118

DTTNR/L
60°

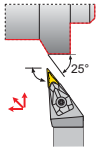


TN..
3
4

■ .750 x .750 / 1.000 x 1.000

T28 | T115 – T118

DVJNR/L
93°

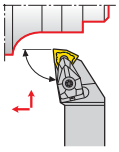


VN..
3

■ .750 x .750 / 1.250 x 1.250

T29 | T123

DWLNR/L
95°

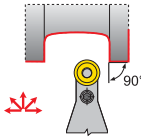


WN..
3
4

■ .625 x .625 / 1.250 x 1.250

T24 | T127 – T129

PRDCN



RC..
.630
.787
.984

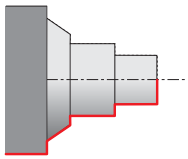
■ 1.260 x .984 / 1.575 x 1.575

35 | 101 - 104

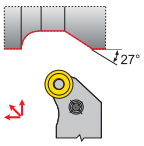
PRAMET

TURNING - EXTERNAL

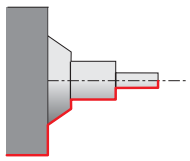
SHORT AND STABLE COMPONENTS (negatively clamped inserts)



PRSCR/L

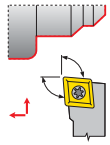
	RC..
	.630 .787 .984
1.260 x .984 1.575 x 1.575	
T36	T101 - T104

TURNING - EXTERNAL
LONG AND UNSTABLE (Positively clamped inserts)



SCLCR/L
95°

CC..
2
3
4

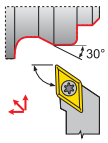


.375 x .375
1.000 x 1.000

T37 | T88 – T90

SDJCR/L
93°

DC..
2
3

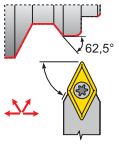


.375 x .375
1.000 x 1.000

T38 | T95 – T97

SDPCN
62°30´

DC..
2
3

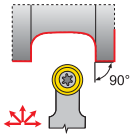


.375 x .375
1.000 x 1.000

T39 | T95 – T97

SRDCN

RC..
.236
.315
.394
.472
.630

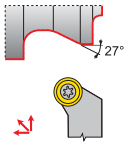


.472 x .472
1.260 x 984

T40 | T101 - T104

SRSCR/L

RC..
.236
.315
.394
.472
.630

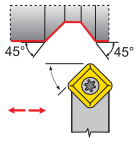


.630 x .630
1.260 x .984

T41 | T101 - T104

SSDCN
45°

SC..
3

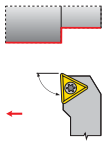


.500 x .500
.625 x .625

T42 | T105 – T107

STGCR/L
93°

TC..
2
3

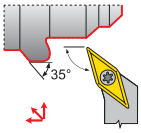


.500 x .500
1.000 x 1.000

T43 | T112 – T114

SVHBR/L
107°30´

VB, VC..
3

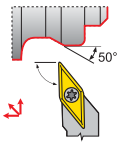


.750 x .750
1.000 x 1.000

T44 | T119 – T122

SVJBR/L
93°

VB, VC..
2
3

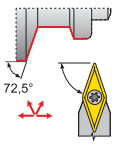


.625 x .625
1.250 x .1.250

T45 | T119 – T122

SVVBN
72°30´

VB, VC..
2
3

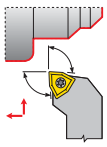


.500 x .500
1.250 x 1.250

T46 | T119 – T122

SWLCR/L
95°

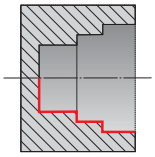
WC..
3
4



.750 x .750
1.000 x 1.000

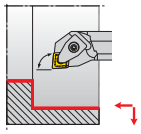
T47 | T124 – T125

TURNING - INTERNAL
SHORT AND STABLE COMPONENTS (negatively clamped inserts)



DCLNR/L

95°



CN..

3
4
5

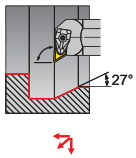
.750 – 1.500

T31

T91 – T94

DDUNR/L

93°



DN..

3
4

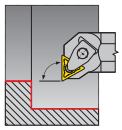
1.000 – 1.500

T32

T97 – T100

DTFNR/L

90°



TN..

3
4

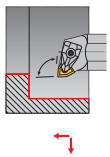
1.000 – 1.500

T33

T115 – T118

DWLNR/L

95°



WN..

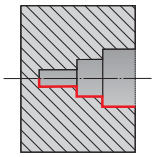
4

1.000 – 1.500

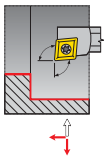
T34

T126 – T129

TURNING - INTERNAL
LONG AND UNSTABLE (positively clamped inserts)



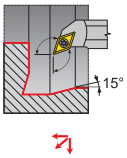
SCLCR/L
95°



ØDmin	CC..
.375 – 1.250	2 3 4

T48 | T88 – T90

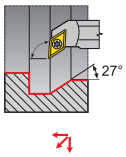
SDQCR/L
107°30´



ØDmin	DC..
.375 – 1.000	2 3

T49 | T95 –T97

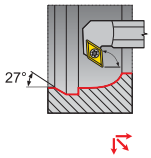
SDUCR/L(-E)
93°



ØDmin	DC..
.375 – 1.250	2 3

T50 | T95 – T97

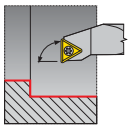
SDZCR/L
93°



ØDmin	DC..
.375 – 1.250	3

T52 | T95 – T97

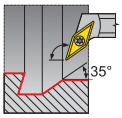
STFCR/L(-E)
90°



ØDmin	DC..
.500 – 1.000	2 3

T53 | T95 – T97

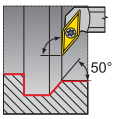
SVQBR/L
107°30´



ØDmin	VB, VC..
1.000 – 1.500	3

T54 | T119 – T122

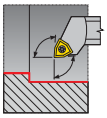
SVUBR/L
93°



ØDmin	VB, VC..
.625 – 1.500	2 3

T55 | T119 – T122

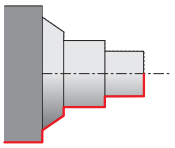
SWLCR/L
95°



ØDmin	WC..
.750	3

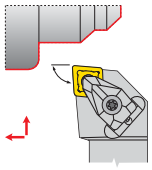
T56 | T124 – T125

TURNING - HEAVY ROUGHING - EXTERNAL
FIXED TOOL HOLDERS



DCLNR/L

95°



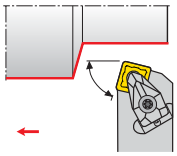
CN..
8

1.500x1.500

T17 | T91 – T94

DSRNR/L

75°

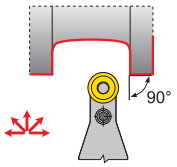


SN..
8

1.500x1.500

T21 | T108 – T110

PRDCN



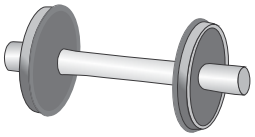
RC..
.787 .984

1.260 x 1.260 1.575 x 1.575

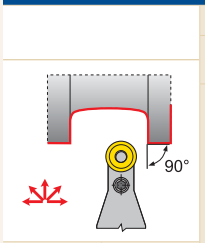
T35 | T101 - T104

TURNING - HEAVY ROUGHING - EXTERNAL

RAILWAY WHEEL MACHINING



PRDCN

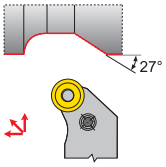


RC..
.787
.984

1.260 x 1.260
1.575 x 1.575

T35 | T101 - T104

PRSCR/L

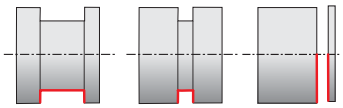


RC..
.787
.984

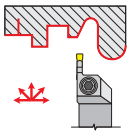
1.260 x 1.260
1.575 x 1.575

T36 | T101 - T104

PARTING OFF AND GROOVING - EXTERNAL



GFKR/L

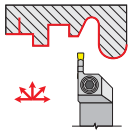


LCMF
.079

■ .625 x .625 – 1.000 x 1.000

T60 | T140

GFIR/L

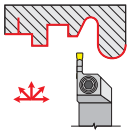


LCMF, LCMR
.118
.157
.197
.236
.315

■ .625 x .625 – 1.250 x 1.000

T61 | T137 – T142

GFMR/L

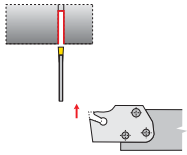


LCMF, LCMR
.118
.157
.197
.236
.315

■ .750 x .750 – 1.250 x 1.000

T62 | T137 – T142

XLCCN + MS-EN

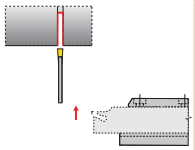


LCMF, LCMR
.118
.157
.197
.236

■ .500 x .500 – 1.250 x 1.000

T73, T72 | T137 – T142

XLCCN + DU

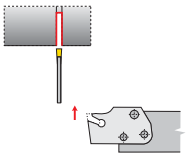


LCMF, LCMR
.118
.157
.197
.236
.315

■ .750 x .750 – 1.500 x 1.500

T73, T78 | T137 – T142

XLCFN/R/L + MS-EN

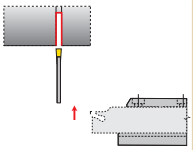


LFMX
.059
.063
.079
.087
.122
.161
.201
.250

■ .500 x .500 – 1.250 x 1.000

T75, T78 | T143

XLCFN + DU

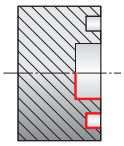


LFMX
.059
.063
.079
.087
.122
.161
.201
.250

■ .750 x .750 – 1.500 x 1.500

T75, T78 | T143

FACE GROOVING

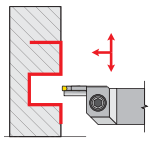


GFIL-L

90°

LCMF, LCMR

.118



min Ø / max Ø

.670 x 1.180
4.330 x 6.690

T68

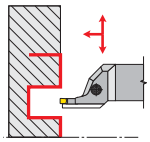
T137 – T142

GFIR-L

90°

LCMF, LCMR

.118
.157



min Ø / max Ø

.670 x 1.180
5.510 x 9.060

T63

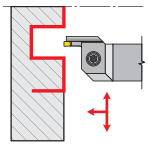
T137 – T142

GFIL-R

90°

LCMF, LCMR

.118
.157



min Ø / max Ø

.670 x 1.180
5.510 x 9.060

T65

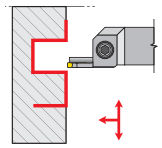
T137 – T142

GFIR-R

90°

LCMF, LCMR

.118



min Ø / max Ø

.670 x 1.180
4.330 x 6.690

T67

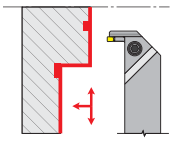
T137 – T142

GGIR/L

90°

LCMF, LCMR

.118



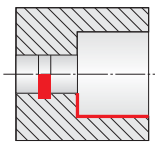
min Ø / max Ø

.670 x 1.180
4.330 x 6.690

T69

T137 – T142

GROOVING - INTERNAL

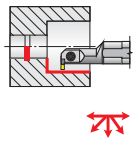


GG.R/L

0°

LCMF, LCMR

.118
.157



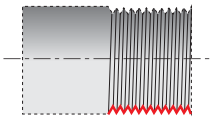
ØDmin

.630
1.260

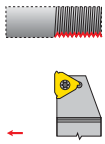
T71

T137 – T142

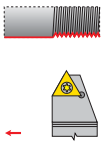
THREAD TURNING - EXTERNAL



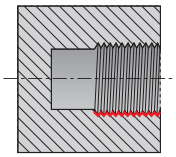
SER/L

	TN..
	3/8 1/2
.750 x .750 1.250 x 1.000	
T80	T144 – T147

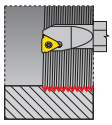
SER/L-S

	TN..
	1/2
1.000 x 1.000 1.250 x 1.000	
T81	T144 – T147

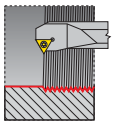
THREAD TURNING - INTERNAL



SIR/L

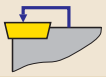
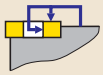
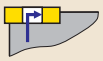
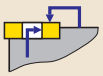
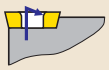
	TN..
	1/4 3/8 1/2
ØDmin .500 1.750	
T82	T144 – T147

SIR/L-S

	TN..
	1/2
ØDmin 1.550 1.800	
T83	T144 – T147

CODE DESIGNATION - EXTERNAL TURNING TOOLS

1 Clamping Designation

C	
D	
P	
M	
S	
X	
G	

2 Insert shape

S	C 80°
T	D 55°
R	K 55°
W 80°	V 35°
L	X Special

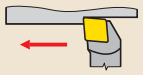
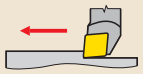
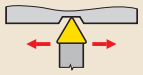
3 Tool style - cutting edge angle

A 90°	B 75°	C 90°	D 45°	D
E 60°	F 90°	G 90°	H 107°30´	J 93°
K 75°	L 95°	M 50°	N 62°30´	P 62°30´
Q 107°30´	R 75°	S 45°	S	T 60°
U 93°	V 72°30´	W 60°	X Special	Y 85°
Z κ				

4 Clearance angle

N	C	P
α_n=0°	α_n=7°	α_n=11°

5 Direction of cut

R	
L	
N	

ISO CODE

1	2	3	4	5		6	7	8	9		10
P	C	L	N	R	-	32	25	L	12	-	S

ANSI CODE

1	2	3	4	5		6 & 7	9	8
D	C	L	N	R	-	16	4	D

6 Shank height [mm]

08	10	12	16	20	25
32	38	40	45	50	60

7 Shank width [mm]

08	10	12	16	20	25
32	38	40	45	50	60

6&7

	b [in]	h [in]		b [in]	h [in]		b [in]	h [in]
05	5/16	5/16	12	3/4	3/4	20	1 1/4	1 1/4
06	3/8	3/8	16	1	1	24	1 1/2	1 1/2
08	1/2	1/2	85	1	1 1/4	32	2	2
10	5/8	5/8	86	1	1 1/2			

For square shanks, this is the number of 16ths of an inch of width and height. For rectangular shanks, the first digit is the number of 8ths of an inch of width, and the second digit is the number of 4ths of an inch of height.

10 Manufacturer's Designation [mm]

M	Clamping system "S" with shim
S	With adjusting screws

8 Total length

	l_1 [in]
A	4.000
B	4.500
C	5.000
D	6.000
E	7.000
F	8.000
M	4.000
N	4.500
R	6.000
S	7.000
T	8.000

	l_1 [mm]
D	60
E	70
F	80
H	100
J	110
K	125
L	140
M	150
N	160
P	170
Q	180
R	200
S	250
T	300
U	350
V	400
W	450
X	Spec.
Y	500

9 Cutting edge length

d = I.C. [mm]	d = I.C. [in]	Symbol	S	C	E	D	V	K	W	T	R
3,97	5/32	1.2					07				
6,00											06
6,35	1/4	2		06		07	11			11	
7,94	5/16	2.5		08	08		13				
8,00										08	
9,525	3/8	3	09	09		11	16	19	06	16	
10,00											10
12,00											12
12,70	1/2	4	12	12		15			08	22	12
15,875	5/8	5	15	16						27	15
16,00											16
19,05	3/4	6	19	19							19
20,00											20
25,00											25
25,40	1	8	25	25							25
38,10	1 1/4	10	38								

PRAMET

CODE DESIGNATION - INTERNAL TURNING TOOLS

1

Shank	
S	Steel shank
A	Steel shank with coolant hole
E	Tungsten carbide shank with steel head and internal coolant supply

2

	d [mm]		d [mm]
08	8	25	25
10	10	32	32
12	12	40	40
16	16	50	50
20	20	60	60

2

	d [in]		d [in]		d [in]
03	.1875	10	.625	28	1.750
04	.250	12	.750	32	2.000
05	.3125	16	1.000	36	2.250
06	.375	20	1.250	40	2.500
08	.500	24	1.500		

	1	2	3		4	5	6	7	8	9		10
ISO CODE	A	25	T	-	P	C	L	N	L	12	-	X

	1	2	3		4	5	6	7	8	9
ANSI CODE	A	16	T	-	D	C	L	N	L	4

3

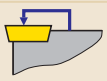
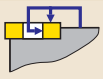
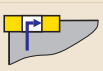
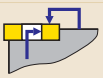
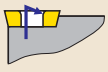
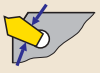
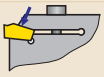
Total length

	l_1 [in]
F	3.250
H	4.000
K	5.000
M	6.000
P	6.250
Q	7.250
R	8.000
S	10.000
T	12.000
U	14.000
V	15.750
W	17.750
Y	20.000
X	Spec.

	l_1 [mm]
D	60
E	70
F	80
H	100
J	110
K	125
L	140
M	150
N	160
P	170
Q	180
R	200
S	250
T	300
U	350
V	400
W	450
X	Spec.
Y	500

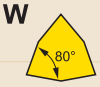
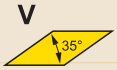
4

Clamping Designation

C	
D	
P	
M	
S	
X	
G	

5

Insert shape

S	C 
T	D 
R	K 
W	 V 
L	X

6

Tool style - cutting edge angle

A 90°	B 75°	C 90°	D 45°	D
E 60°	F 90°	G 90°	H 107°30´	J 93°
K 75°	L 95°	M 50°	N 62°30´	P 117°30´
Q 107°30´	R 75°	S 45°	S	T 60°
U 93°	V 72°30´	W 60°	X Special	Y 85°
Z κ				

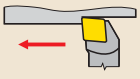
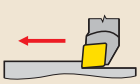
7

Clearance angle

N	C	P
α_n=0°	α_n=7°	α_n=11°

8

Direction of cut

R	
L	

9

Cutting edge length

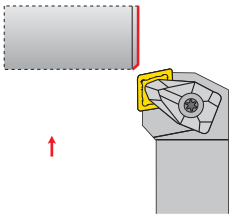
d = I.C. [mm]	d = I.C. [in]	Symbol	S	C	E	D	V	K	W	T	R
3,97	5/32	1.2					07		02	06	
5,56					05					09	
6,00											06
6,35	1/4	2		06	06	07	11			11	
7,94	5/16	2.5		08	08		13				
8,00											08
9,525	3/8	3	09	09		11	16	19	06	16	
10,00											10
12,00											12
12,70	1/2	4	12	12		15			08	22	12
15,875	5/8	5	15	16						27	15
16,00											16
19,05	3/4	6	19	19							19
20,00											20
25,00	1	8									25
25,40	1 1/4	10	25	25							25

10

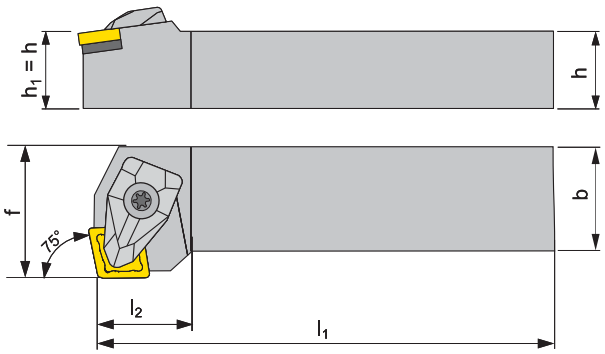
Manufacturer's Designation

X	Special shank style
.	
.	
87	
90	Z - style tool setting angle
93	
.	
.	

DCKNR/L



T91 - T94, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

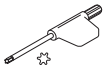
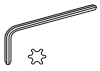
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DCKNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.300				-6	-6	1.54	DC12	CN.. 43.

All dimensions [in]

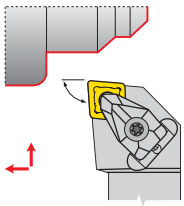
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

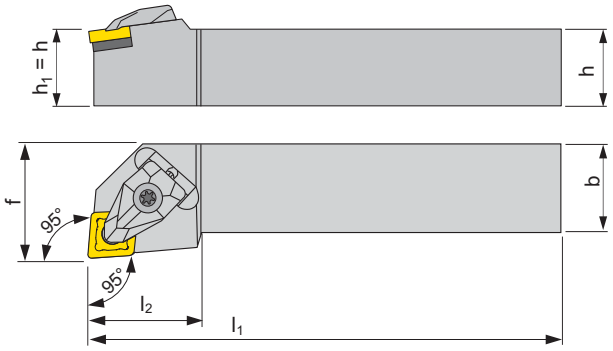
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DC12	DCS 12	DCS 234-01	US 2002-T15P	FLAG T15P/3,5	-	

● stocked as standard /○ not stocked as standard
See price list for current availability.

DCLNR/L



T91 - T94, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DCLNR/L 10 3A	● / ●	.625	.625	.875	4.000	.980				-6	-6	.45	DC09	CN.. 32.
DCLNR/L 12 3C	● / ●	.750	.750	1.000	5.000	.980				-6	-6	1.05	DC09	CN.. 32.
DCLNR/L 12 4B	● / ●	.750	.750	1.000	4.500	1.260				-6	-6	.88	DC12	CN.. 43.
DCLNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.260				-6	-6	1.54	DC12	CN.. 43.
DCLNR/L 85 4D	● / ●	1.250	1.000	1.500	6.000	1.260				-6	-6	4.70	DC12	CN.. 43.
DCLNR/L 85 5D	● / ●	1.250	1.000	1.500	6.000	1.540				-6	-6	4.70	DC16	CN.. 54.
DCLNR/L 20 6D	● / ●	1.250	1.250	1.500	6.000	1.700				-6	-6	2.76	DC19	CN.. 64.
DCLNR/L 24 6D	● / ●	1.500	1.500	2.000	6.000	1.700				-6	-6	4.95	DC19	CN.. 64.
DCLNR/L 24 8E	● / ●	1.500	1.500	2.000	7.000	2.090				-6	-6	6.18	DC25	CN.. 86.

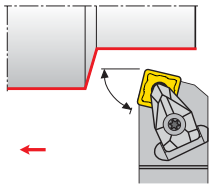
All dimensions [in]

SPARE PARTS

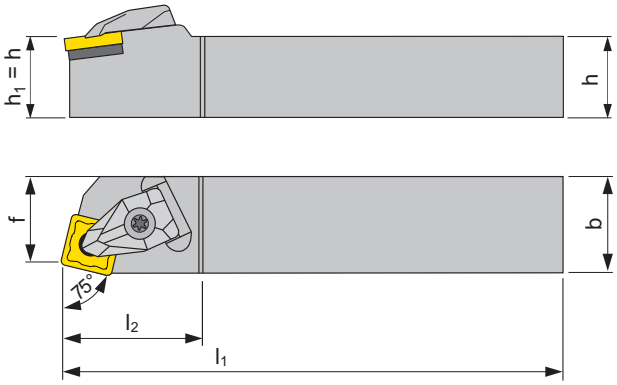
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DC09	DCS 09	DCS 236-04	US 2004-T09P	FLAG T09P	-	
DC12	DCS 12	DCS 234-01	US 2002-T15P	FLAG T15P/3,5	-	
DC16	DCS 16	DCS 234-03	US 2007-T20P	-	LK T20P	
DC19	DCS 19	DCS 236-01	US 2007-T20P	-	LK T20P	
DC25	DCS 25	DCS 234-05	US 2008-T25P	-	LK T25P	

DCRNR/L



T91 - T94, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

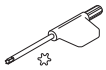
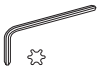
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DCRNR/L 12 4B	● / ●	.750	.750	.855	4.500	1.350				-6	-6	.88	DC12	CN.. 43.
DCRNR/L 16 4D	● / ●	1.000	1.000	1.048	6.000	1.350				-6	-6	1.54	DC12	CN.. 43.
DCRNR/L 20 4D	● / ●	1.250	1.250	1.292	6.000	1.350				-6	-6	2.76	DC12	CN.. 43.
DCRNR/L 20 5D	● / ●	1.250	1.250	1.291	6.000	1.640				-6	-6	2.76	DC16	CN.. 54.
DCRNR/L 20 6D	● / ●	1.250	1.250	1.291	6.000	1.820				-6	-6	2.76	DC19	CN.. 64.
DCRNR/L 24 6D	● / ●	1.500	1.500	1.697	6.000	1.820				-6	-6	4.95	DC19	CN.. 64.

All dimensions [in]

SPARE PARTS

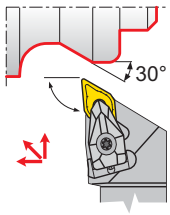
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DC12	DCS 12	DCS 234-01	SS 2002-T15P	FLAG T15P/3,5	-	
DC16	DCS 16	DCS 234-03	SS 2007-T20P	FLAG T20P	-	
DC19	DCS 19	DCS 236-01	SS 2007-T20P	-	LK T20P	

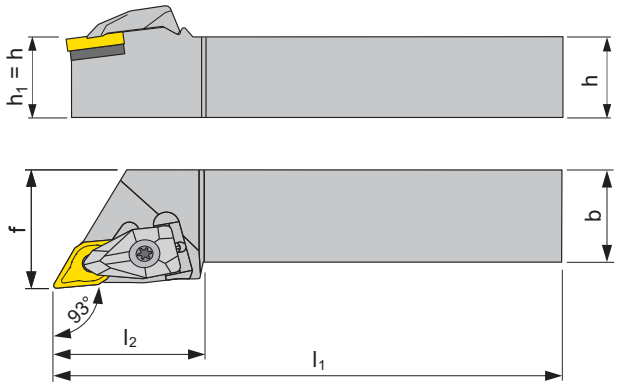
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

DDJNR/L



T97 -T100



γ_o° - Rake Angle
λ_s° - Angle of Inclination

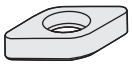
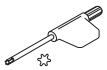
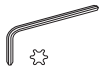
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DDJNR/L 12 3C	● / ●	.750	.750	1.000	5.000	1.190				-6	-6	1.05	DD11	DN.. 33.
DDJNR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.190				-6	-6	1.54	DD11	DN.. 33.
DDJNR/L 12 4B	● / ●	.750	.750	1.000	4.500	1.450				-6	-6	.88	DD1506	DN.. 43.
DDJNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.550				-6	-6	1.54	DD1506	DN.. 43.
DDJNR/L 20 4D	● / ●	1.250	1.250	1.500	6.000	1.550				-6	-6	2.76	DD1506	DN.. 43.

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DD11	DCS 09	DDS 267-01	US 2004-T09P	FLAG T09P	-	
DD1506	DCS 12	DDS 266-01	US 2002-T15P	FLAG T15P/3,5	-	

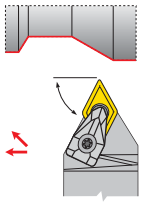
OPTIONALE SPARE PARTS

Insert	Shim
DN.. 44.	DDS 266-02

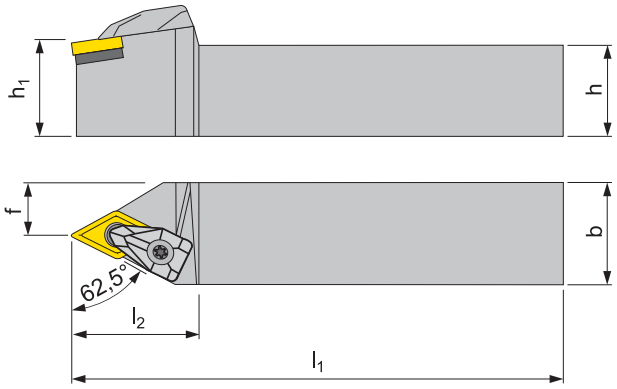
PRAMET

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DDPNR/L



T97 -T100



γ_o° - Rake Angle
λ_s° - Angle of Inclination

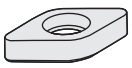
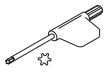
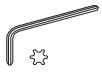
TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h_1	b	f	l_1	l_2				λ_s°	γ_o°			
DDPNN 12 3B	●	.750	.750	.375	4.500	1.230				-9	-5	.88	DD11	DN.. 33.
DDPNN 16 4D	●	1.000	1.000	.500	6.000	1.610				-9	-5	1.54	DD1506	DN.. 43.

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

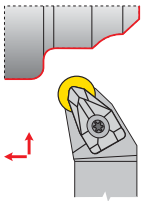
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DD11	DCS 09	DDS 267-01	US 2004-T09P	FLAG T09P	-	
DD1506	DCS 12	DDS 266-01	US 2002-T15P	FLAG T15P/3,5	-	

OPTIONALE SPARE PARTS

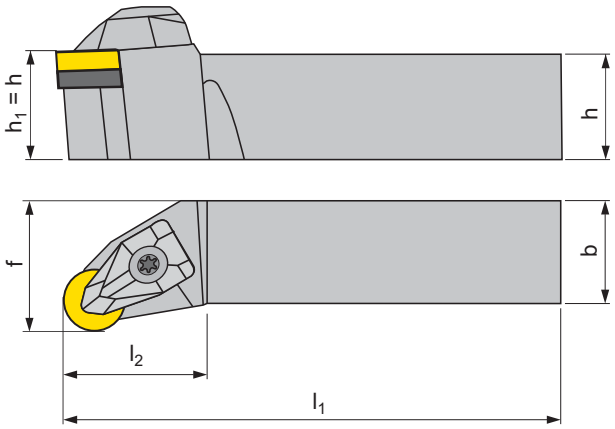
Insert	Shim
DN.. 44.	DDS 266-02

● stocked as standard /○ not stocked as standard
See price list for current availability.

DRSNR/L



T105



γ_o° - Rake Angle
λ_s° - Angle of Inclination

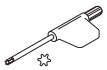
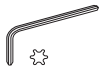
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DRSNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.244				-6	-6	1.54	DR12	RN.. 43

All dimensions [in]

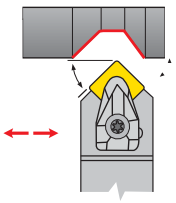
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

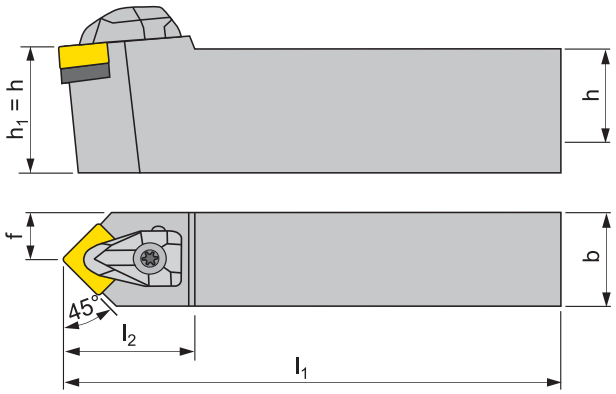
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DR12	DCS 12	DRS 155-02	US 2002-T15P	FLAG T15P/3,5	-	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DSDNR/L



T108 -T110



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DSDNN 12 4B	●	.750	.750	.386	4.500	1.450				-6	-6	.88	DS12	SN.. 43.
DSDNN 16 4D	●	1.000	1.000	.512	6.000	1.450				-6	-6	1.54	DS12	SN.. 43.
DSDNN 20 5D	●	1.250	1.250	.646	6.000	1.760				-6	-6	2.76	DS15	SN.. 54.
DSDNN 20 6D	●	1.250	1.250	.646	6.000	1.970				-6	-6	2.76	DS19	SN.. 64.
DSDNN 24 8D	●	1.500	1.500	.791	6.000	2.260				-6	-6	4.95	DS25	SN.. 85.

All dimensions [in]

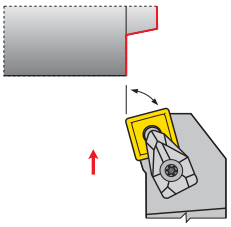
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

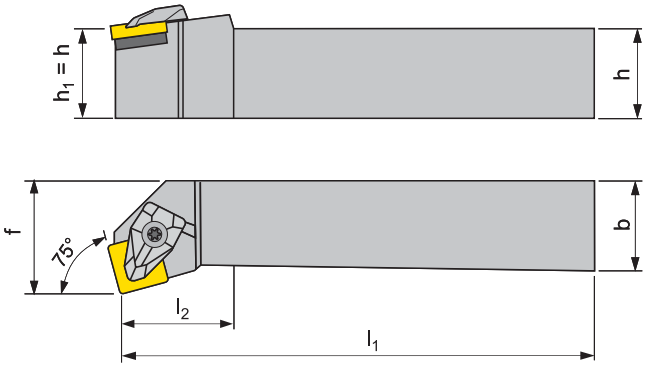
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DS12	DCS 12	DSS 425-01	US 2002-T15P	FLAG T15P/3,5	-	
DS15	DCS 16	DSS 425-03	US 2007-T20P	-	LK T20P	
DS19	DCS 19	DSS 425-04	US 2007-T20P	-	LK T20P	
DS25	DCS 25	DSS 425-07	US 2008-T25P	-	LK T25P	

● stocked as standard /○ not stocked as standard
See price list for current availability.

DSKNR/L



T108 -T110



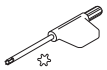
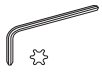
γ_o° - Rake Angle
λ_s° - Angle of Inclination

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DSKNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	.930				-6	-6	1.54	DS12	SN.. 43.
DSKNR/L 20 5D	● / ●	1.250	1.250	1.500	6.000	1.140				-6	-6	2.76	DS16	SN.. 54.

All dimensions [in]

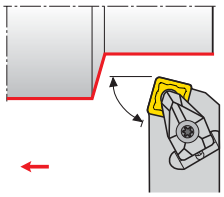
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

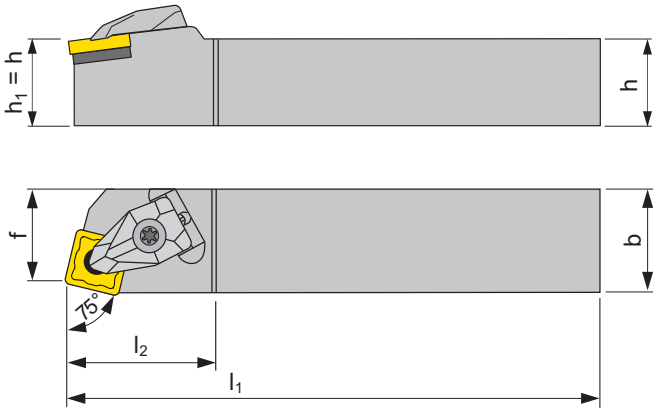
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DS12	DCS 12	DSS 425-01	US 2002-T15P	FLAG T15P/3,5	-	
DS16	DCS 16	DSS 425-03	US 2007-T20P	-	LK T20P	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DSRNR/L



T108 -110



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DSRNR/L 12 4B	● / ●	.750	.750	.855	4.500	1.350				-6	-6	.88	DS12	SN.. 43.
DSRNR/L 16 4D	● / ●	1.000	1.000	1.048	6.000	1.350				-6	-6	1.54	DS12	SN.. 43.
DSRNR/L 20 5D	● / ●	1.250	1.250	1.291	6.000	1.640				-6	-6	2.76	DS15	SN.. 54.
DSRNR/L 20 6D	● / ●	1.250	1.250	1.292	6.000	1.830				-6	-6	2.76	DS19	SN.. 64.
DSRNR/L 24 6D	● / ●	1.500	1.500	1.697	6.000	1.830				-6	-6	4.95	DS19	SN.. 64.
DSRNR/L 24 8E	● / ●	1.500	1.500	1.697	7.000	2.220				-6	-6	6.18	DS25	SN.. 85.

All dimensions [in]

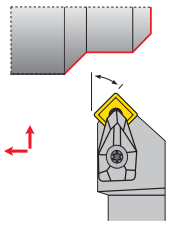
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

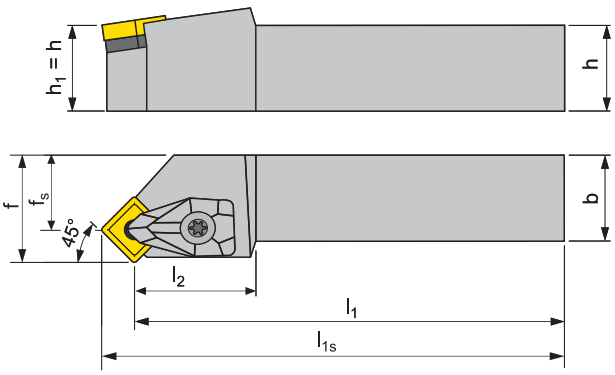
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DS12	DCS 12	DSS 425-01	US 2002-T15P	FLAG T15P/3,5	-	
DS15	DCS 16	DSS 425-03	US 2007-T20P	-	LK T20P	
DS19	DCS 19	DSS 425-04	US 2007-T20P	-	LK T20P	
DS25	DCS 25	DSS 425-07	US 2008-T25P	-	LK T25P	

● stocked as standard /○ not stocked as standard
See price list for current availability.

DSSNR/L



T108 -110



γ_o° - Rake Angle
λ_s° - Angle of Inclination

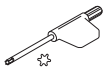
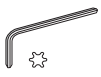
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	fs	l1	l1s	l2		λs°	γo°			
DSSNR/L 12 4B	● / ●	.750	.750	1.000	.740	4.500	4.880	1.130		0	-8	.88	DS12	SN.. 43.
DSSNR/L 16 4D	● / ●	1.000	1.000	1.250	.925	6.000	6.327	1.172		0	-8	1.54	DS12	SN.. 43.
DSSNR/L 20 5D	● / ●	1.250	1.250	1.500	1.098	6.000	6.413	1.303		0	-8	2.76	DS15	SN.. 54.
DSSNR/L 20 6D	● / ●	1.250	1.250	1.500	1.008	6.000	6.492	1.413		0	-8	2.76	DS19	SN.. 64.
DSSNR/L 24 6E	● / ●	1.500	1.500	2.000	1.508	7.000	7.492	1.484		0	-8	6.18	DS19	SN.. 64.

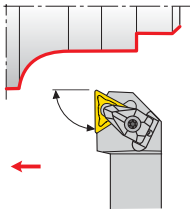
All dimensions [in]

SPARE PARTS

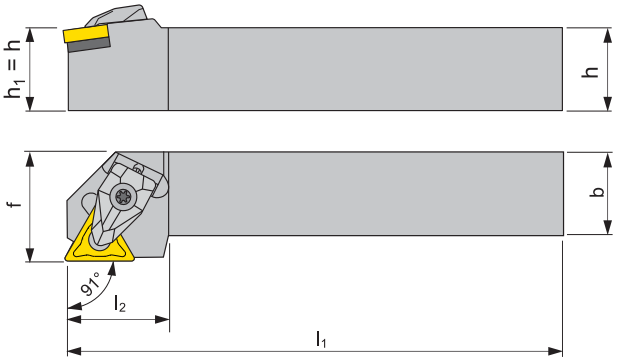
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DS12	DCS 12	DSS 425-01	US 2002-T15P	FLAG T15P/3,5	-	
DS15	DCS 16	DSS 425-03	US 2007-T20P	-	LK T20P	
DS19	DCS 19	DSS 425-04	US 2007-T20P	-	LK T20P	

DTGNR/L



T115 - T118, T133



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DTGNR/L 12 3B	● / ●	.750	.750	1.000	4.500	.970				-6	-6	.88	DT16	TN.. 33.
DTGNR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	.970				-6	-6	1.54	DT16	TN.. 33.
DTGNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.260				-6	-6	1.54	DT22	TN.. 43.
DTGNR/L 20 4D	● / ●	1.250	1.250	1.500	6.000	1.310				-6	-6	2.76	DT22	TN.. 43.
DTGNR/L 24 5D	● / ●	1.500	1.500	2.000	6.000	1.550				-6	-6	4.95	DT27	TN.. 54.

All dimensions [in]

SPARE PARTS

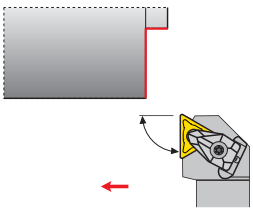
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DT16	DCS 09	DTS 315-02	US 2004-T09P	FLAG T09P	-	
DT22	DCS 12	DTS 315-04	US 2002-T15P	FLAG T15P/3,5	-	
DT27	DCS 16	DTS 315-05	US 2007-T20P	-	LK T20P	

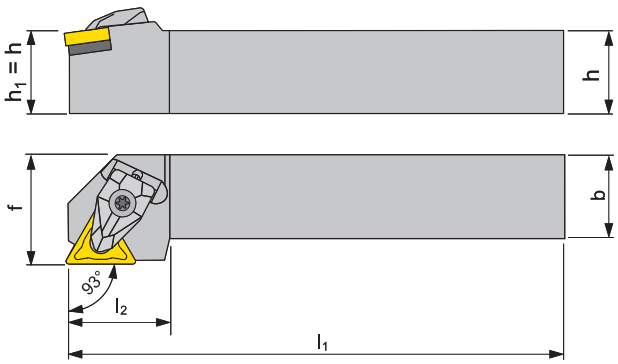
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

DTJNR/L



T115 - T118, T133



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DTJNR/L 12 3B	● / ●	.750	.750	1.000	4.500	.953				-6	-6	.88	DT16	TN.. 33.
DTJNR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	.980				-6	-6	1.54	DT16	TN.. 33.
DTJNR/L 20 4D	● / ●	1.250	1.250	1.500	6.000	1.283				-6	-6	2.76	DT22	TN.. 43.

All dimensions [in]

SPARE PARTS

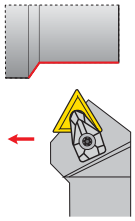
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DT16	DCS 09	DTS 315-02	US 2004-T09P	FLAG T09P	-	
DT22	DCS 12	DTS 315-04	US 2002-T15P	FLAG T15P/3,5	-	

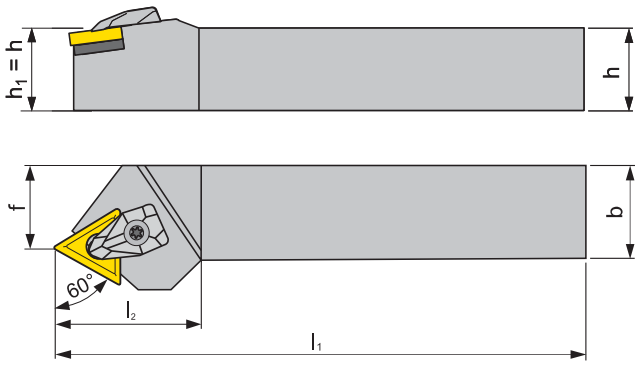
PRAMET

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DTTNR/L



T115 - T118, T133



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions h=h1	b	f	l1	l2				λs°	γo°	[lbs]	Spare parts	Inserts
DTTNR/L 12 3B	● / ●	.750	.750	.598	4.500	1.190				-6	-6	.88	DT16	TN.. 33.
DTTNR/L 16 4D	● / ●	1.000	1.000	.791	6.000	1.560				-6	-6	1.54	DT22	TN.. 43.

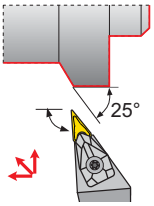
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

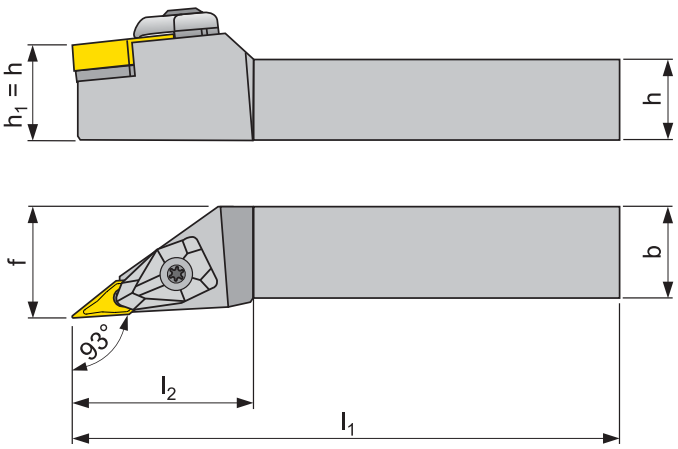
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DT16	DCS 09	DTS 315-02	US 2004-T09P	FLAG T09P	-	
DT22	DCS 12	DTS 315-04	US 2002-T15P	FLAG T15P/3,5	-	

● stocked as standard /○ not stocked as standard
See price list for current availability.

DVJNR/L



T123, T134



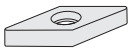
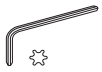
γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
DVJNR/L 12 3B	● / ●	.750	.750	1.000	4.500	1.830				-13	-4	.88	DV16	VN.. 33.
DVJNR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.830				-13	-4	1.54	DV16	VN.. 33.
DVJNR/L 20 3D	● / ●	1.250	1.250	1.500	6.000	1.830				-13	-4	2.76	DV16	VN.. 33.

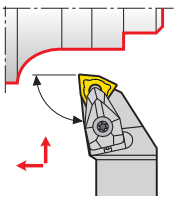
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

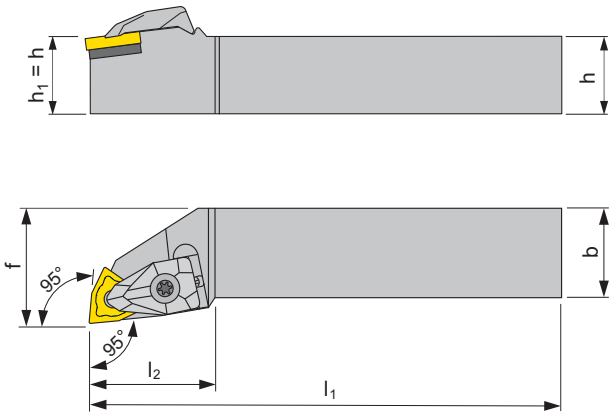
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DV16	DCS 16V	DVS 269-01	US 2009-T15P	FLAG T15P/3,5	-	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DWLNR/L



T126 - T129, T135



γ_o° - Rake Angle
λ_s° - Angle of Inclination

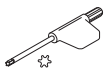
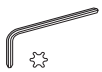
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
DWLNR/L 10 3B	● / ●	.625	.625	.875	4.500	1.070				-6	-6	.60	DW06	WN.. 33.
DWLNR/L 12 3C	● / ●	.750	.750	1.000	5.000	1.950				-6	-6	1.05	DW06	WN.. 33.
DWLNR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.950				-6	-6	1.54	DW06	WN.. 33.
DWLNR/L 12 4C	● / ●	.750	.750	1.000	5.000	1.378				-6	-6	1.05	DW08	WN.. 43.
DWLNR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	1.350				-6	-6	1.54	DW08	WN.. 43.
DWLNR/L 20 4D	● / ●	1.250	1.250	1.500	6.000	1.378				-6	-6	2.76	DW08	WN.. 43.

All dimensions [in]

SPARE PARTS

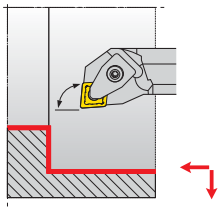
*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DW06	DCS 09	DWS 328-01	US 2004-T09P	FLAG T09P	-	
DW08	DCS 12	DWS 331-12	US 2002-T15P	FLAG T15P/3,5	-	

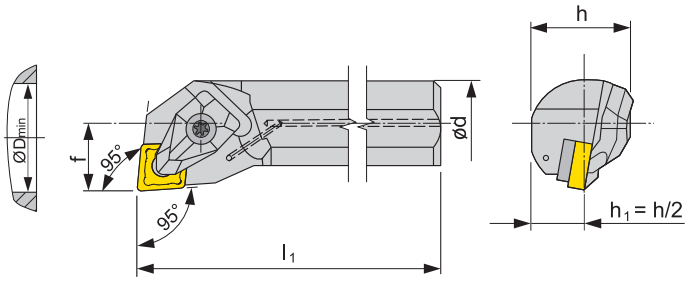
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

DCLNR/L



T91 - T94, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1	l_2		λ_s°	γ_o°			
A12S-DCLNR/L 3	● / ●	.750	1.000	.500	.709	10.000	1.024		-14	-6	1.21	DC09	CN.. 32.
A16T-DCLNR/L 4	● / ●	1.000	1.280	.640	.906	12.000	1.339		-12	-6	1.54	DCI12	CN.. 43.
A20T-DCLNR/L 4	● / ●	1.250	1.468	.765	1.181	12.000	1.299		-11	-6	3.08	DCI12	CN.. 43.
A24T-DCLNR/L 4	● / ●	1.500	1.760	.890	1.374	12.000	1.575		-16	-6	8.25	DCI12	CN.. 43.
A24T-DCLNR/L 5	● / ●	1.500	1.760	.890	1.374	12.000	1.575		-18	-6	8.25	DC16	CN.. 54.

All dimensions [in]

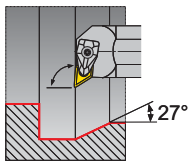
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

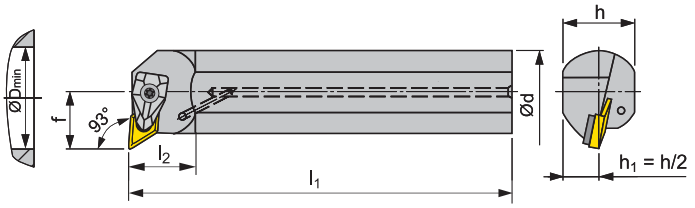
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
DC09	DCS 09	DCS 236-04	US 2004-T09P	FLAG T09P	-	
DCI12	DCS 12	DCS 236-03	US 2002-T15P	FLAG T15P/3,5	-	
DC16	DCS 16	DCS 234-03	US 2007-T20P	-	LK T20P	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DDUNR/L



T97 -T100



γ_o° - Rake Angle
λ_s° - Angle of Inclination

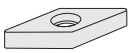
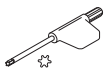
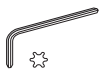
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1	l_2		λ_s°	γ_o°			
A16T-DDUNR/L 3	● / ●	1.000	1.299	.750	.906	12.000	1.142		-12	-6	1.54	DD11	DN.. 33.
A20T-DDUNR/L 3	● / ●	1.250	1.705	1.000	1.181	12.000	1.181		-9	-6	3.08	DD11	DN.. 33.
A20T-DDUNR/L 4	● / ●	1.250	1.705	1.000	1.181	12.000	1.181		-13	-6	3.08	DD1504	DN.. 44.
A24T-DDUNR/L 4	● / ●	1.500	2.000	1.125	1.374	12.000	1.299		-11	-6	8.25	DD1504	DN.. 44.

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DD11	DCS 09	DDS 267-01	US 2004-T09P	FLAG T09P	-	
DD1504	DCS 12	DDS 266-02	US 2002-T15P	FLAG T15P/3,5	-	

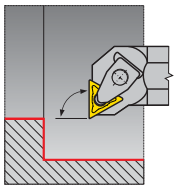
OPTIONALE SPARE PARTS

Insert	Shim
DN.. 43.	DDS 266-01

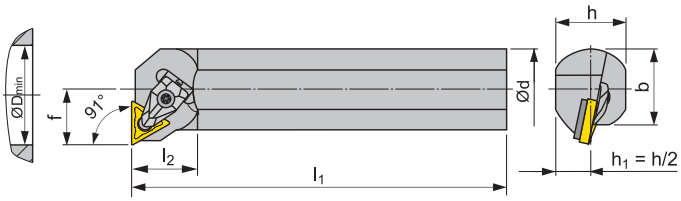
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

DTFNR/L



T115 - T118, T133



γ_o° - Rake Angle
λ_s° - Angle of Inclination

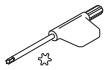
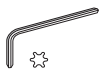
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1	l_2		λ_s°	γ_o°			
A16T-DTFNR/L 3	● / ●	1.000	1.201	.640	.906	12.000	1.339		-12	-6	1.54	DT16	TN.. 33.
A20T-DTFNR/L 3	● / ●	1.250	1.468	.765	1.181	12.000	1.417		-11	-6	3.08	DT16	TN.. 33.
A24T-DTFNR/L 4	● / ●	1.500	1.760	.890	1.374	12.000	1.417		-15	-6	8.25	DT22	TN.. 43.

All dimensions [in]

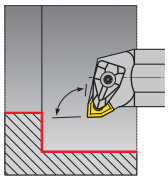
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

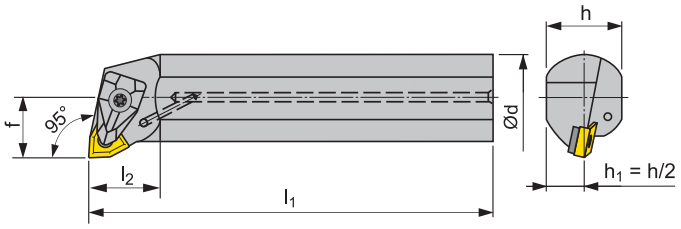
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DT16	DCS 09	DTS 316-01	US 2004-T09P	FLAG T09P	-	
DT22	DCS 12	DTS 315-04	US 2002-T15P	FLAG T15P/3,5	-	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DWLNR/L



T126 - T129, T135



γ_o° - Rake Angle
λ_s° - Angle of Inclination

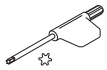
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1	l_2		λ_s°	γ_o°			
A16T-DWLNR/L 4	● / ●	1.000	1.299	.750	.906	12.000	1.339		-12	-6	1.54	DWI08	WN.. 43.
A20T-DWLNR/L 4	● / ●	1.250	1.705	1.000	1.181	12.000	1.339		-15	-6	3.08	DWI08	WN.. 43.
A24T-DWLNR/L 4	● / ●	1.500	2.000	1.000	1.374	12.000	1.339		-13	-6	8.25	DW08	WN.. 43.

All dimensions [in]

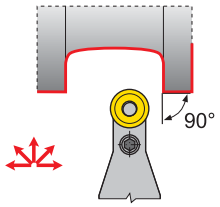
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

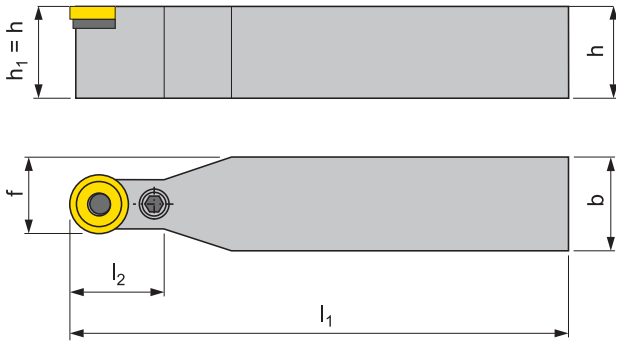
Type	Complete clamp set*	Shim	Shim screw	Key	Key	
						
DWI08	DCS 12	DWS 328-02	US 2002-T15P	FLAG T15P/3,5	-	
DW08	DCS 12	DWS 331-12	US 2002-T15P	FLAG T15P/3,5	-	

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRDCN



T104



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
PRDCN 3225 P 16	●	1.260	.984	0.807	6.693	1.260				0	0	1.76	PRP70	RCMX 1606 M0
PRDCN 3232 P 20	●	1.260	1.260	1.024	6.693	1.260				0	0	2.87	PRP90	RCMX 2006 M0
PRDCN 4040 S 20	●	1.575	1.575	1.181	9.843	1.575				0	0	6.84	PRP90	RCMX 2006 M0
PRDCN 4040 S 25	●	1.575	1.575	1.280	9.843	1.575				0	0	7.06	PRP80	RCMX 2507 M0

All dimensions [in]

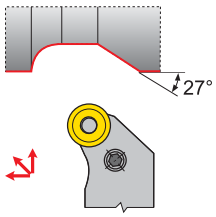
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

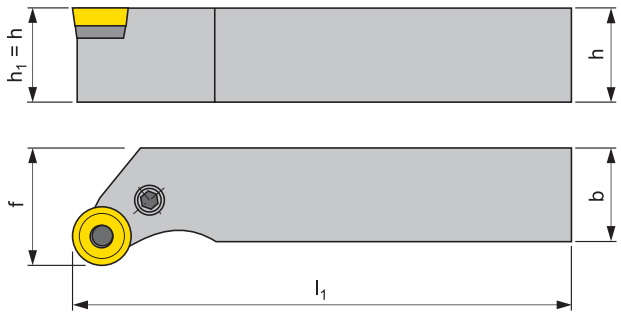
Type	Shim	Clamping lever	Clamp. screw*	Tubular rivet	Mount. taper plug	Key
PRP70	RCU 160300	PU 07	US 36 (M8x26,0)	NT 05	MT 05	HXK 4
PRP80	RCU 250600	PU 08	US 38 (M10x29,0)	NT 06	MT 06	HXK 5
PRP90	RCU 200400	PU 09	US 36 (M8x26,0)	NT 07	MT 07	HXK 4

● stocked as standard / ○ not stocked as standard
See price list for current availability.

PRSCR/L



T104



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions h=h1	b	f	l1					λs°	γo°	[lbs]	Spare parts	Inserts
PRSCR/L 3225 P 16	● / ●	1.260	.984	0.807	6.693					0	0	1.98	PRP70	RCMX 1606 M0
PRSCR/L 3232 P 20	● / ●	1.260	1.260	1.024	6.693					0	0	3.09	PRP90	RCMX 2006 M0
PRSCR/L 4040 S 25	● / ●	1.575	1.575	1.280	9.843					0	0	7.50	PRP80	RCMX 2507 M0

All dimensions [in]

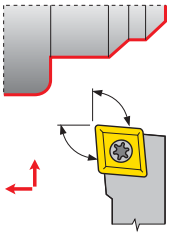
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

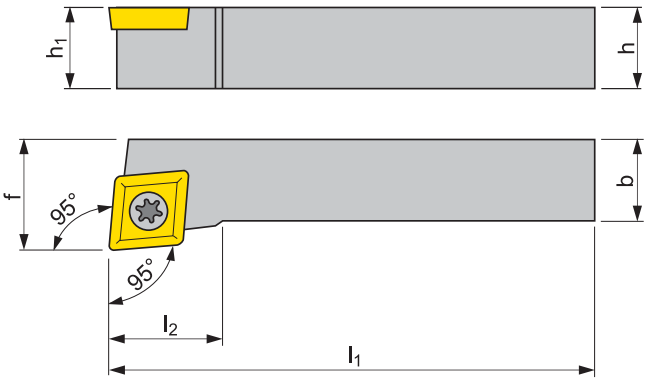
Type	Shim	Clamping lever	Clamp. screw*	Tubular rivet	Mount. taper plug	Key
PRP70	RCU 160300	PU 07	US 36 (M8x26,0)	NT 05	MT 05	HXK 4
PRP80	RCU 250600	PU 08	US 38 (M10x29,0)	NT 06	MT 06	HXK 5
PRP90	RCU 200400	PU 09	US 36 (M8x26,0)	NT 07	MT 07	HXK 4

● stocked as standard /○ not stocked as standard
See price list for current availability.

SCLCR/L



T88 - T90, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

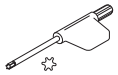
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SCLCR/L 06 2	● / ●	.375	.375	.500	2.500	.390				0	0	.24	SC06	CC.. 21.5.
SCLCR/L 08 3	● / ●	.500	.500	.625	3.500	.390				0	0	.33	SC09	CC.. 32.5.
SCLCR/L 10 3	● / ●	.625	.625	.750	4.000	.630				0	0	.62	SC09S	CC.. 32.5.
SCLCR/L 12 4B	● / ●	.750	.750	1.000	4.500	.830				0	0	.88	SC12	CC.. 43.
SCLCR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	.830				0	0	1.54	SC12	CC.. 43.

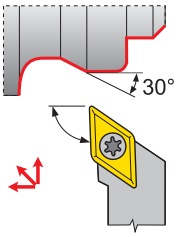
All dimensions [in]

SPARE PARTS

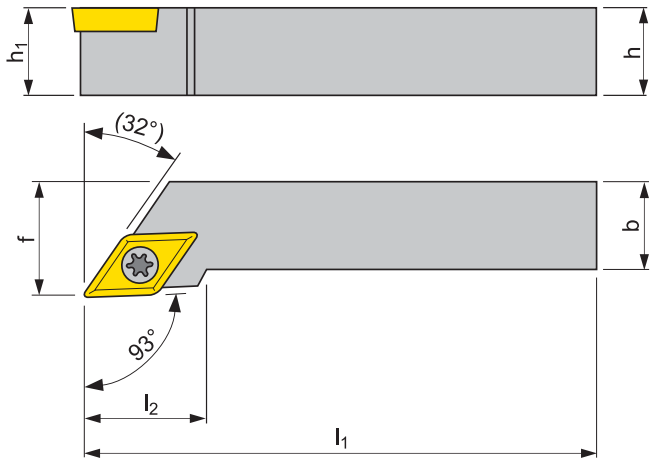
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SC06	US 2003-T07P	-	-	FLAG T07P		
SC09	US 2010-T15P	-	-	FLAG T15P/3,5		
SC09S	US 2001-T15P	SCS 232-01	MS 9001	FLAG T15P/3,5		
SC12	US 2018-T15P	SCS 232-02	MS 9003	FLAG T15P/4		

SDJCR/L



T95 - T97, T132



γ_o° - Rake Angle
λ_s° - Angle of Inclination

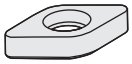
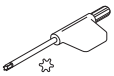
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SDJCR/L 06 2	● / ●	.375	.375	.500	2.500	.590				0	0	.24	SD07	DC.. 21.5.
SDJCR/L 08 2	● / ●	.500	.500	.625	3.500	.670				0	0	.33	SD07	DC.. 21.5.
SDJCR/L 12 3B	● / ●	.750	.750	1.000	4.500	.940				0	0	.88	SD11	DC.. 32.5.
SDJCR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.100				0	0	1.54	SD11	DC.. 32.5.

All dimensions [in]

SPARE PARTS

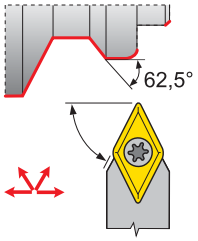
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SD07	US 2003-T07P	-	-	FLAG T07P		
SD11	US 2001-T15P	SDS 263-01	MS 9001	FLAG T15P/3,5		

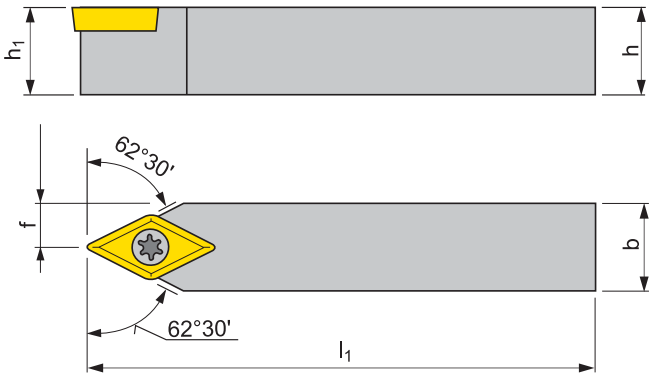
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

SDPCN



T95 - T97, T132



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SDPCN 06 2	●	.375	.375	.216	2.500	.571				0	0	.24	SD07	DC.. 21.5.
SDPCN 08 2	●	.500	.500	.279	3.482	.571				0	0	.33	SD07	DC.. 21.5.
SDPCN 10 3	●	.625	.625	.341	4.000	.862				0	0	.62	SD11	DC.. 32.5.
SDPCN 12 3B	●	.750	.750	.404	4.500	.862				0	0	.88	SD11	DC.. 32.5.
SDPCN 16 3C	●	1.000	1.000	.529	5.000	.890				0	0	1.54	SD11	DC.. 32.5.

All dimensions [in]

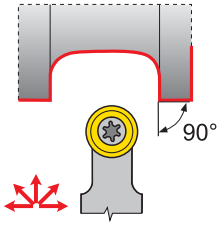
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

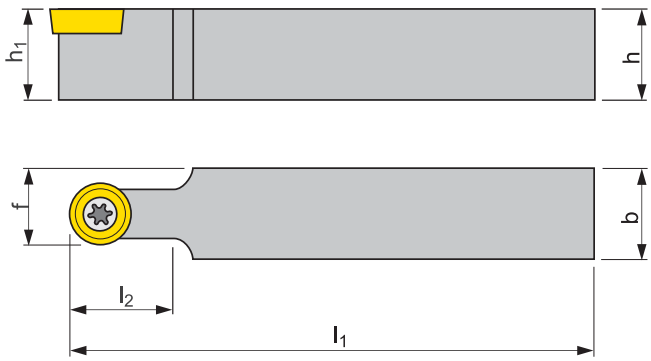
Type	Clamp. screw*	Shim	Shim screw	Screwdriver	Key		
SD07	US 2003-T07P	-	-	FLAG T07P			
SD11	US 2001-T15P	SDS 263-01	MS 9001	FLAG T15P/3,5			

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SRDCN



T101 - T104



γ_o° - Rake Angle
λ_s° - Angle of Inclination

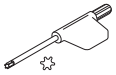
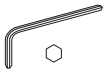
TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SRDCN 1212 F 06	●	.472	.472	.354	3.150	.472				0	0	.22	S01	RC.. 0602M0
SRDCN 1616 H 06	●	.630	.630	.433	3.937	.472				0	0	.44	S01	RC.. 0602M0
SRDCN 2020 K 08	●	.787	.787	.551	4.921	.787				0	0	.88	S03	RC.. 0803M0
SRDCN 2020 K 1003-M-A	●	.787	.787	.591	4.921	.984				0	0	.88	SR10	RC.. 1003M0
SRDCN 2020 K 10-M-A	●	.787	.787	.591	4.921	.984				0	0	.88	SR10	RC.. 10T3M0
SRDCN 2525 M 10-M-A	●	.984	.984	.689	5.906	.984				0	0	19725	SR10	RC.. 10T3M0
SRDCN 2525 M 12-M-A	●	.984	.984	.728	5.906	1.181				0	0	19725	SR12	RC.. 1204M0
SRDCN 3225 P 10-M	●	1.260	.984	.689	6.693	.984				0	0	35796	SR10	RC.. 10T3M0
SRDCN 3225 P 12-M	●	1.260	.984	.728	6.693	1.181				0	0	35796	SR12	RC.. 1204M0
SRDCN 3225 P 16-M	●	1.260	.984	.807	6.693	1.260				0	0	44228	SR16	RC.. 1606M0

All dimensions [in]

SPARE PARTS

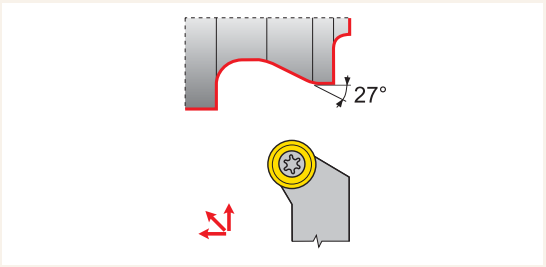
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver	Key		
							
S01	US 2506-T07P	-	-	FLAG T07P	-		
S03	US 3007-T09P	-	-	FLAG T09P	-		
SR10	US 3510-T15P	SRN 100300	MS 3510	FLAG T15P	HXK 3,5		
SR12	US 3510-T15P	SRN 120300	MS 3510	FLAG T15P	HXK 3,5		
SR16	US 5018-T20P	SRN 16T3M0	MS 5015	FLAG T20P	HXK 5		

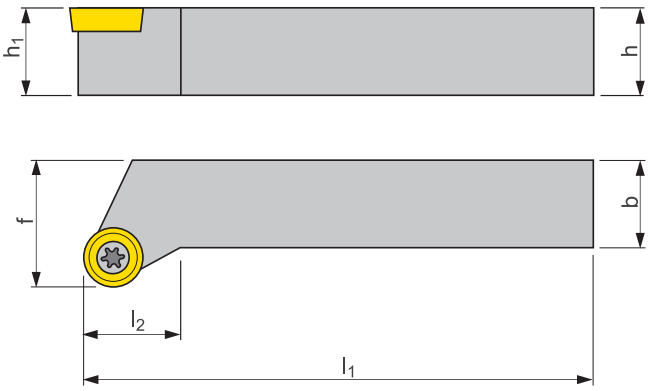
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SRSCR/L



T101 - T104



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SRSCR/L 1616 H 06	● / ●	.630	.630	.787	3.937	.472				0	0	.485	S01	RC.. 0602M0
SRSCR/L 2020 K 08	● / ●	.787	.787	.984	4.921	.787				0	0	.992	S03	RC.. 0803M0
SRSCR/L 2020 K 10-M-A	● / ●	.787	.787	.984	4.921	.787				0	0	.992	SR10	RC.. 10T3M0
SRSCR/L 2525 M 10-M-A	● / ●	.984	.984	1.260	5.906	.787				0	0	1.654	SR10	RC.. 10T3M0
SRSCR/L 2525 M 12-M-A	● / ●	.984	.984	1.260	5.906	.787				0	0	1.654	SR12	RC.. 1204M0
SRSCR/L 3225 P 16-M	● / ●	1.260	.984	1.260	6.693	.787				0	0	2.430	SR16	RC.. 1606M0

All dimensions [in]

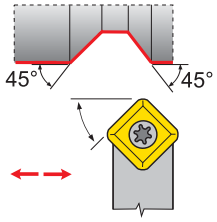
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

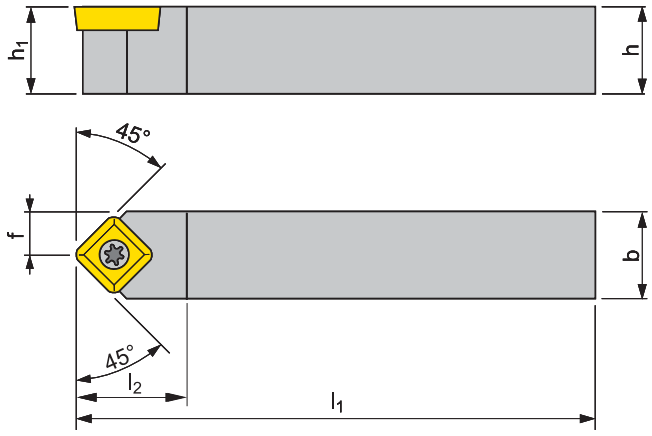
Type	Clamp. screw*	Shim	Shim screw	Screwdriver	Key		
S01	US 2506-T07P	-	-	FLAG T07P	-		
S03	US 3007-T09P	-	-	FLAG T09P	-		
SR10	US 3510-T15P	SRN 100300	MS 3510	FLAG T15P	HXK 3,5		
SR12	US 3510-T15P	SRN 120300	MS 3510	FLAG T15P	HXK 3,5		
SR16	US 5018-T20P	SRN 16T3M0	MS 5015	FLAG T20P	HXK 5		

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SSDCN



T106 - T107



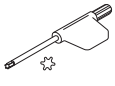
γ_o° - Rake Angle
λ_s° - Angle of Inclination

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
SSDCN 08 3	●	.500	.500	.261	3.500	.594				0	0	.33	SS09	SC.. 32.5.
SSDCN 10 3	●	.625	.625	.323	4.000	.594				0	0	.62	SS09S	SC.. 32.5.

All dimensions [in]

SPARE PARTS

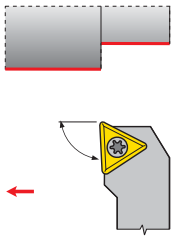
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver			
							
SS09	US 2010-T15P	-	-	FLAG T15P/3,5			
SS09S	US 2001-T15P	SSS 420-01	MS 9001	FLAG T15P/3,5			

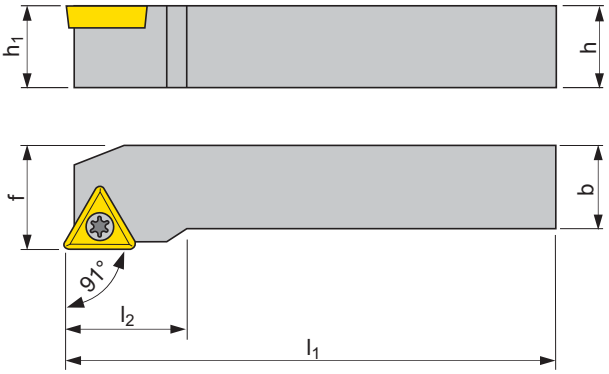
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

STGCR/L



T112 - T114, T133



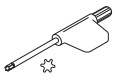
γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
STGCR/L 08 2	● / ●	.500	.500	.625	3.500	.543				0	0	.33	ST11	TC.. 21.5.
STGCR/L 12 3B	● / ●	.750	.750	1.000	4.500	.815				0	0	.88	ST16	TC.. 32.5.
STGCR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	.815				0	0	1.54	ST16	TC.. 32.5.

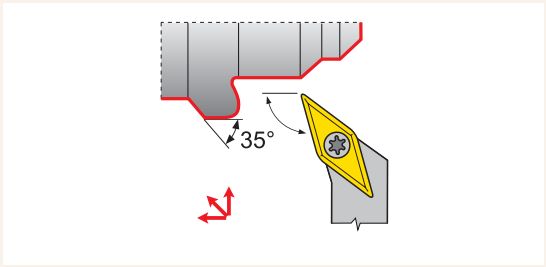
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

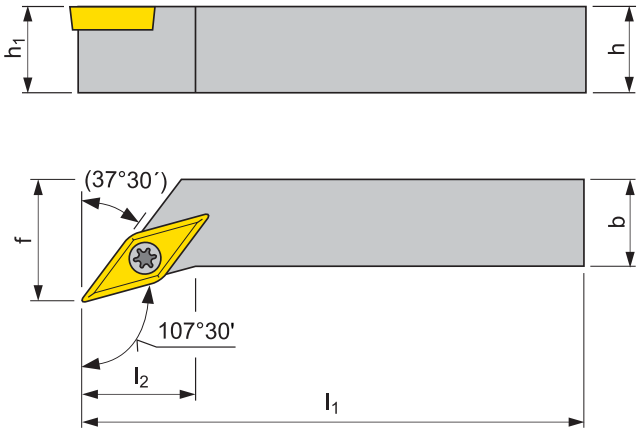
Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
ST11	US 2003-T07P	-	-	FLAG T07P		
ST16	US 2001-T15P	STS 320-01	MS 9001	FLAG T15P/3,5		

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SVHBR/L



T119, T120-T122



γ_o° - Rake Angle
λ_s° - Angle of Inclination

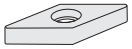
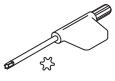
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SVHBR/L 12 3B	● / ●	.750	.750	1.000	4.500	1.087				0	0	.88	SV16S	VB.. 33.;VC.. 33.
SVHBR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.087				0	0	1.54	SV16S	VB.. 33.;VC.. 33.

All dimensions [in]

SPARE PARTS

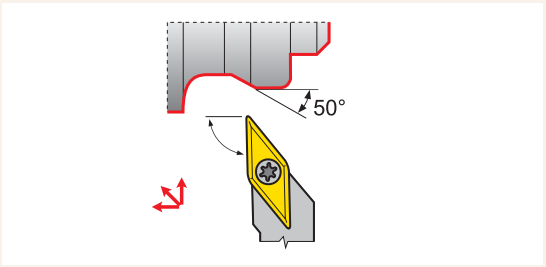
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver			
							
SV16S	US 2001-T15P	SVS 270-01	MS 9001	FLAG T15P/3,5			

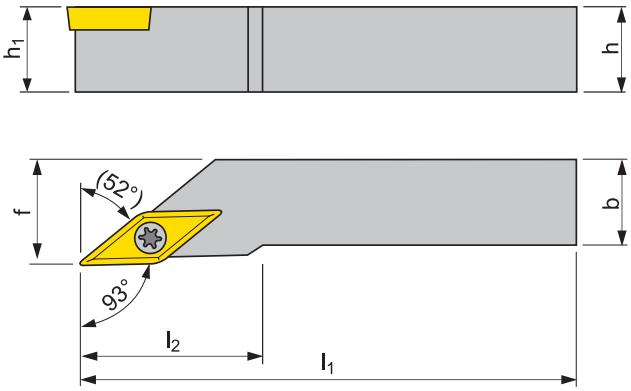
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SVJBR/L



T119, T120-T122



γ_o° - Rake Angle
λ_s° - Angle of Inclination

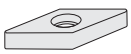
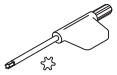
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SVJBR/L 10 2	● / ●	.625	.625	.750	4.000	.835				0	0	.22	SV11	VB.. 22.;VC.. 22.
SVJBR/L 12 2B	● / ●	.750	.750	1.000	4.500	.835				0	0	.88	SV11	VB.. 22.;VC.. 22.
SVJBR/L 12 3B	● / ●	.750	.750	1.000	4.500	1.228				0	0	.88	SV16S	VB.. 33.;VC.. 33.
SVJBR/L 16 3D	● / ●	1.000	1.000	1.250	6.000	1.240				0	0	1.54	SV16S	VB.. 33.;VC.. 33.
SVJBR/L 20 3D	● / ●	1.250	1.250	1.500	6.000	1.240				0	0	2.76	SV16S	VB.. 33.;VC.. 33.

All dimensions [in]

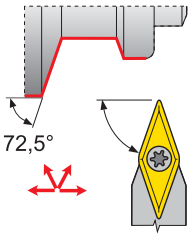
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

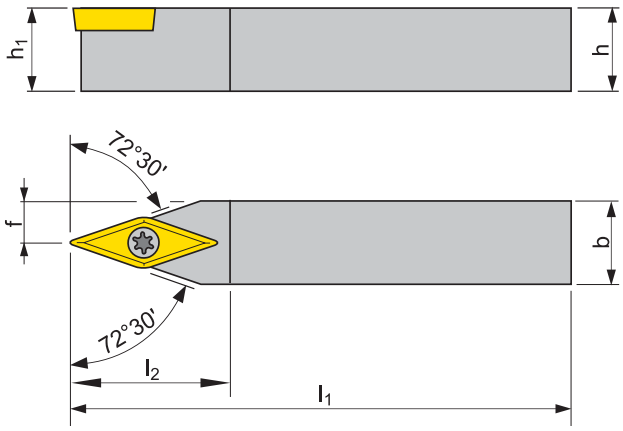
Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SV11	US 2003-T07P	-	-	FLAG T07P		
SV16S	US 2001-T15P	SVS 270-01	MS 9001	FLAG T15P/3,5		

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SVVBN



T119, T120-T122



γ_o° - Rake Angle
λ_s° - Angle of Inclination

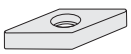
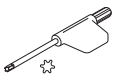
TOOLS FOR EXTERNAL TURNING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λ_s°	γ_o°			
SVVBN 08 2	●	.500	.500	.260	3.500	.831				0	0	.22	SV11	VB.. 22.;VC.. 22.
SVVBN 12 2B	●	.750	.750	.384	4.500	.831				0	0	.88	SV11	VB.. 22.;VC.. 22.
SVVBN 12 3B	●	.750	.750	.395	4.500	1.240				0	0	.88	SV16	VB.. 33.;VC.. 33.
SVVBN 16 3D	●	1.000	1.000	.520	6.000	1.240				0	0	1.54	SV16	VB.. 33.;VC.. 33.
SVVBN 20 3D	●	1.250	1.250	.645	6.000	1.240				0	0	2.76	SV16	VB.. 33.;VC.. 33.

All dimensions [in]

SPARE PARTS

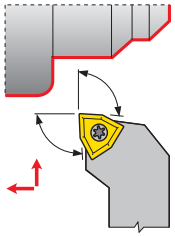
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SV11	US 2003-T07P	-	-	FLAG T07P		
SV16	US 2001-T15P	SVS 270-01	MS 9001	FLAG T15P/3,5		

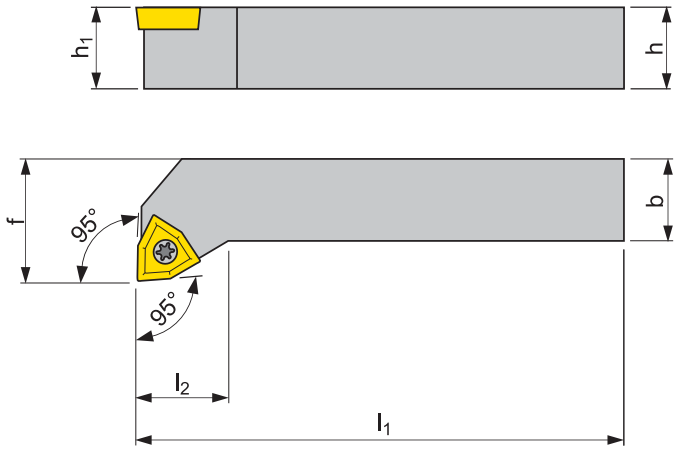
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SWLCR/L



T124 - T125



γ_o° - Rake Angle
λ_s° - Angle of Inclination

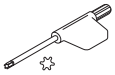
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	f	l1	l2				λs°	γo°			
SWLCR/L 12 3B	● / ●	.750	.750	1.000	4.500	.630				0	0	.88	S08	WC.. 32.5.
SWLCR/L 16 4D	● / ●	1.000	1.000	1.250	6.000	.830				0	0	1.54	S09	WC.. 43.

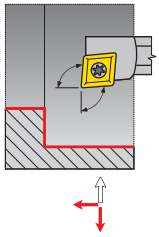
All dimensions [in]

SPARE PARTS

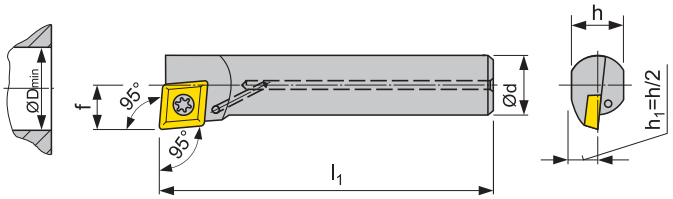
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
S08	US 3510-T15P	-	-	FLAG T15P		
S09	US 4512-T15P	-	-	FLAG T15P		

SCLCR/L



T88 - T90, T131



γ_o° - Rake Angle
λ_s° - Angle of Inclination

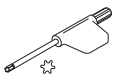
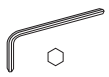
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1			λ_s°	γ_o°			
A06M-SCLCR/L 2	● / ●	.375	.480	.250	.336	6.000			-11	0	.13	C06M	CC.. 21.5.
A08M-SCLCR/L 2	● / ●	.500	.598	.312	.460	6.000			-8	0	.33	C06	CC.. 21.5.
A10R-SCLCR/L 3	● / ●	.625	.772	.406	.562	8.000			-9	0	.66	C09M	CC.. 32.5.
A12S-SCLCR/L 3	● / ●	.750	.929	.500	.709	10.000			-6	0	1.21	C09	CC.. 32.5.
A16T-SCLCR/L 3	● / ●	1.000	1.201	.640	.906	12.000			-4	0	1.54	C09	CC.. 43.
A20T-SCLCR/L 4	● / ●	1.250	1.468	.765	1.181	12.000			-11	0	3.08	C12	CC.. 43.

All dimensions [in]

SPARE PARTS

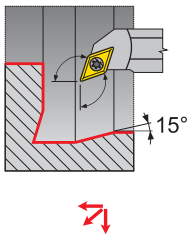
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
C06M	US 2046-T07P	-	-	FLAG T07P		
C06	US 2003-T07P	-	-	FLAG T07P		
C09M	US 2009-T15P	-	-	FLAG T15P/3,5		
C09	US 2010-T15P	-	-	FLAG T15P/3,5		
C12	US 2018-T15P	SCS 232-02	MS 9003	FLAG T15P/4		

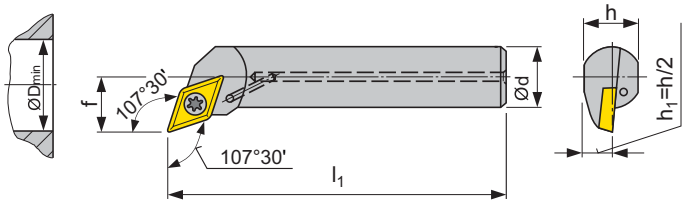
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SDQCR/L



T95 - T97, T132



γ_o° - Rake Angle
λ_s° - Angle of Inclination

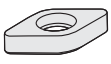
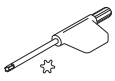
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1		λ_s°	γ_o°			
A06M-SDQCR/L 2	● / ●	.375	.598	.375	.336	6.000		-8	0	.13	SD07	DC.. 21.5.
A08M-SDQCR/L 2	● / ●	.500	.728	.437	.460	6.000		-6	0	.33	SD07	DC.. 21.5.
A10R-SDQCR/L 2	● / ●	.625	.850	.500	.562	8.000		-4	0	.66	SD07	DC.. 21.5.
A12S-SDQCR/L 3	● / ●	.750	.980	.562	.709	10.000		-6	0	1.21	SD11M	DC.. 32.5.
A16T-SDQCR/L 3	● / ●	1.000	1.299	.750	.906	12.000		-3	0	1.54	SD11	DC.. 32.5.

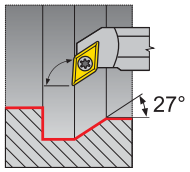
All dimensions [in]

SPARE PARTS

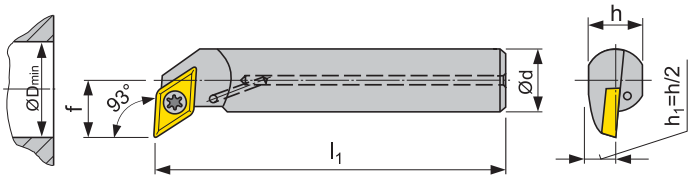
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SD07	US 2003-T07P	-	-	FLAG T07P		
SD11M	US 2009-T15P	-	-	FLAG T15P/3,5		
SD11	US 2010-T15P	-	-	FLAG T15P/3,5		

SDUCR/L



T95 - T97, T132



γ_o° - Rake Angle
λ_s° - Angle of Inclination

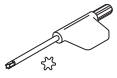
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1		λ_s°	γ_o°			
A06M-SDUCR/L 2	● / ●	.375	.598	.375	.336	6.000		-7	0	.13	SD07	DC.. 21.5.
A08M-SDUCR/L 2	● / ●	.500	.728	.438	.460	6.000		-5	0	.33	SD07	DC.. 21.5.
A10R-SDUCR/L 2	● / ●	.625	.850	.500	.562	8.000		-4	0	.66	SD07	DC.. 21.5.
A12S-SDUCR/L 3	● / ●	.750	1.051	.625	.709	10.000		-5	0	1.21	SD11M	DC.. 32.5.
A16T-SDUCR/L 3	● / ●	1.000	1.299	.750	.906	12.000		-3	0	1.54	SD11	DC.. 32.5.
A20T-SDUCR/L 3	● / ●	1.250	1.579	.875	1.181	12.000		-8	0	3.08	SD11V	DC.. 32.5.

All dimensions [in]

SPARE PARTS

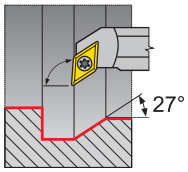
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SD07	US 2003-T07P	-	-	FLAG T07P		
SD11M	US 2009-T15P	-	-	FLAG T15P/3,5		
SD11	US 2010-T15P	-	-	FLAG T15P/3,5		
SD11V	US 2001-T15P	SDS 263-01	MS 9001	FLAG T15P/3,5		

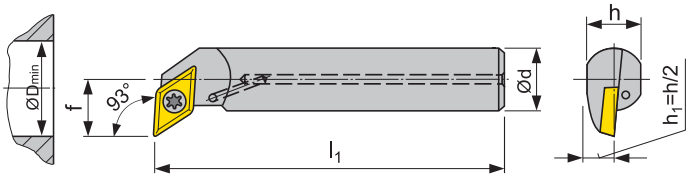
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SDUCR/L-E



T95 -T 97



γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR INTERNAL TURNING

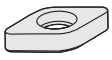
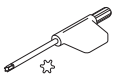
Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1				λ_s°	γ_o°			
E06M-SDUCR/L 2	● / ●	.375	.598	.375	.336	6.000				-7	0	1.20	SD07	DC.. 21.5.
E08R-SDUCR/L 2	● / ●	.500	.716	.438	.460	8.000				-5	0	1.65	SD07	DC.. 21.5.
E10R-SDUCR/L 2	● / ●	.625	.850	.500	.562	8.000				-4	0	2.35	SD07	DC.. 21.5.

All dimensions [in]

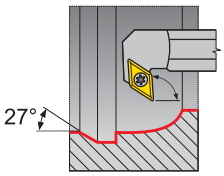
Tungsten carbide shank with steel head and internal coolant supply

SPARE PARTS

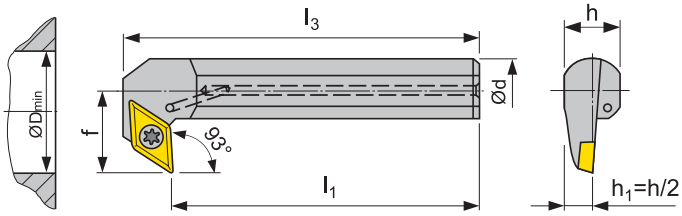
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SD07	US 2003-T07P	-	-	FLAG T07P		

SDZCR/L



T 95 - T97, T132



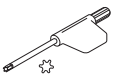
γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1	l_3	λ_s°	γ_o°			
A20T-SDZCR/L 3-93	● / ●	1.250	1.579	.875	1.181	12.000	12.658	-7	0	3.08	SD11V	DC.. 32.5.

SPARE PARTS

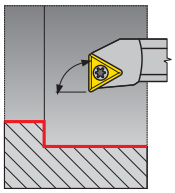
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SD11V	US 2001-T15P	SDS 263-01	MS 9001	FLAG T15P/3,5		

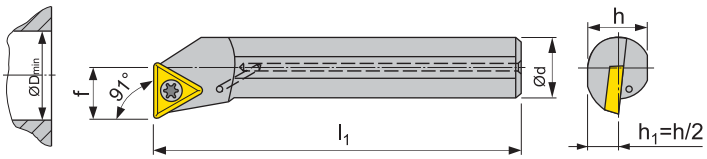
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

STFCR/L



T 112 - T114, T133



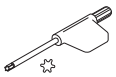
γ_o° - Rake Angle
λ_s° - Angle of Inclination

TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1		λ_s°	γ_o°			
A08M-STFCR/L 2	● / ●	.500	.598	.312	.460	6.000		-7	0	.33	ST11	TC.. 21.5.
A10R-STFCR/L 2	● / ●	.625	.772	.406	.562	8.000		-5	0	.66	ST11	TC.. 21.5.
A12S-STFCR/L 2	● / ●	.750	.929	.500	.709	10.000		-3	0	1.21	ST11	TC.. 21.5.
A16T-STFCR/L 3	● / ●	1.000	1.201	.640	.906	12.000		-4	0	1.54	ST16	TC.. 32.5.

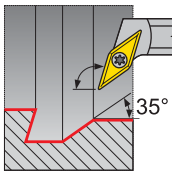
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

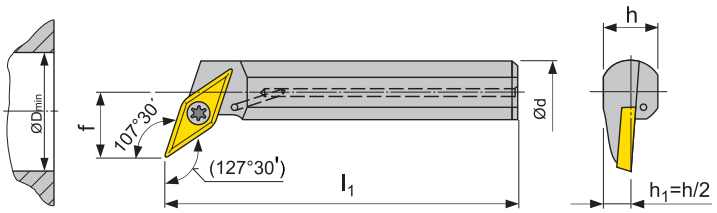
Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
ST11	US 2003-T07P	-	-	FLAG T07P		
ST16	US 2010-T15P	-	-	FLAG T15P/3,5		

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SVQBR/L



T119, T120 - T122



γ_o° - Rake Angle
λ_s° - Angle of Inclination

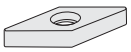
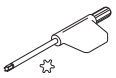
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1			λ_s°	γ_o°			
A16T-SVQBR/L 3	● / ●	1.000	1.299	.750	.906	12.000			-7	0	1.54	SV16	VB.. 33.; VC.. 33.
A20T-SVQBR/L 3	● / ●	1.250	1.579	.875	1.181	12.000			-7	0	4.51	SV16S	VB.. 33.; VC.. 33.
A24T-SVQBR/L 3	● / ●	1.500	1.841	1.063	1.374	12.000			-5	0	8.25	SV16S	VB.. 33.; VC.. 33.

All dimensions [in]

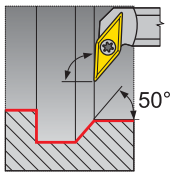
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

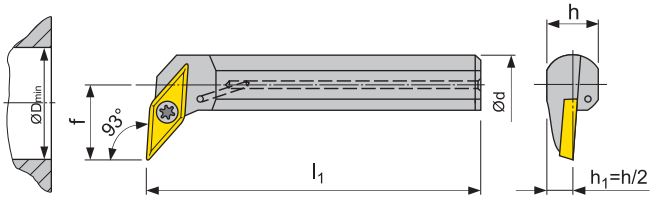
Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SV16	US 2010-T15P	-	-	FLAG T15P/3,5		
SV16S	US 2001-T15P	SVS 270-01	MS 9001	FLAG T15P/3,5		

● stocked as standard /○ not stocked as standard
See price list for current availability.

SVUBR/L



T119, T120 - T122



γ_o° - Rake Angle
λ_s° - Angle of Inclination

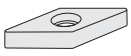
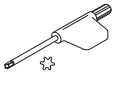
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1			λ_s°	γ_o°			
A10R-SVUBR/L 2	● / ●	.625	.850	.486	.560	8.000			-7	0	.66	SV11	VB.. 22.; VC.. 22.
A12S-SVUBR/L 2	● / ●	.750	1.012	.580	.710	10.000			-5	0	1.21	SV11	VB.. 22.; VC.. 22.
A20T-SVUBR/L 3	● / ●	1.250	1.705	1.000	1.181	12.000			-5	0	4.51	SV16S	VB.. 33.; VC.. 33.
A24T-SVUBR/L 3	● / ●	1.500	2.126	1.125	1.374	12.000			-3	0	8.25	SV16S	VB.. 33.; VC.. 33.

All dimensions [in]

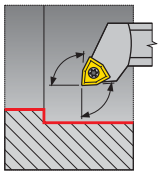
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

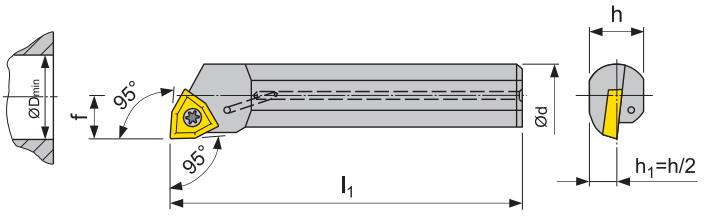
Type	Clamp. screw*	Shim	Shim screw	Screwdriver		
						
SV11	US 2020-T07P	-	-	FLAG T07		
SV16S	US 2001-T15P	SVS 270-01	MS 9001	FLAG T15P/3,5		

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SWLCR/L



T124 - T125



γ_o° - Rake Angle
λ_s° - Angle of Inclination

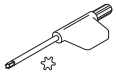
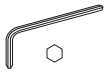
TOOLS FOR INTERNAL TURNING

Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	D_{min}	f	h	l_1			λ_s°	γ_o°			
A12S-SWLCR/L 3	● / ●	.750	.929	.500	.709	10.000			-6	0	1.32	S08	WC.. 32.5.

All dimensions [in]

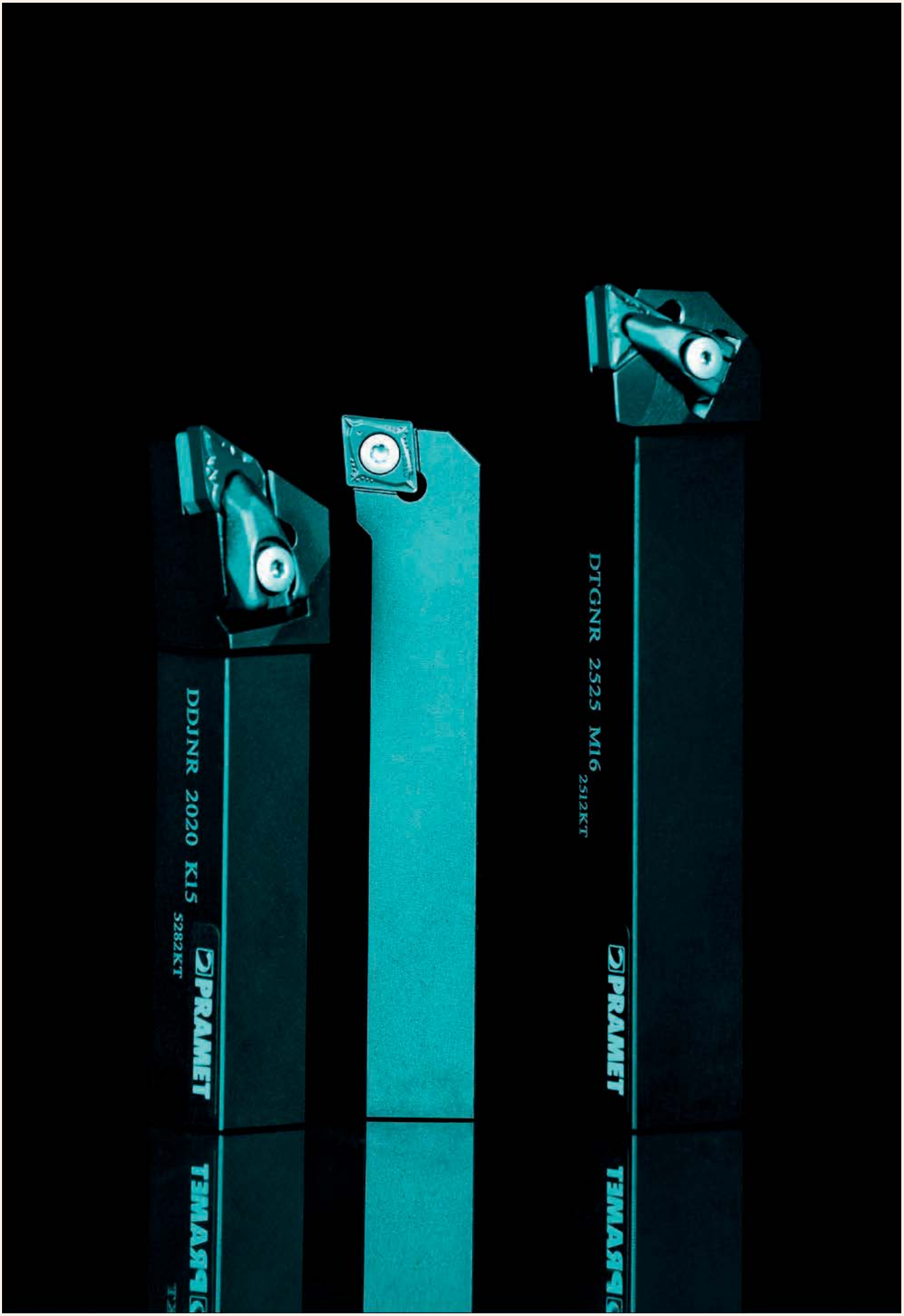
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim	Shim screw*	Screwdriver	Key	
						
S08	US 3510-T15P	-	-	FLAG T15P	-	

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET


DDJNR 2020 K15
5282KT
PRAMET
DTGNR 2525 M16
2512KT
PRAMET

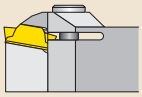
CODE DESIGNATION - PARTING AND GROOVING TOOLS - EXTERNAL TURNING

	1	2	3	4	5	6	7	8	9	10	11
ISO CODE	G	F	I	L	25	25	M	0316	R	030	017
	1	2	3	4	5 & 6		7	8	9	10	11
ANSI CODE	G	F	I	L	16		D	0316	R	1.18	.670

1

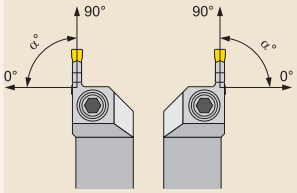
Clamping Designation

G



2

Tool style - cutting edge angle



α	
G = 0°	K = 75°
R = 15°	F = 90°
T = 30°	B = 105°
S = 45°	E = 120°
W = 60°	D = 135°

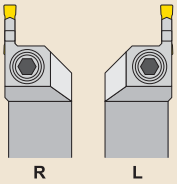
3

Maximum grooving/turning depth

G = 2,0 × a	N = 5,5 × a
H = 2,5 × a	O = 6,0 × a
I = 3,0 × a	P = 6,5 × a
J = 3,5 × a	Q = 7,0 × a
K = 4,0 × a	R = 7,5 × a
L = 4,5 × a	S = 8,0 × a
M = 5,0 × a	T = 8,5 × a

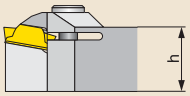
4

Version (right/left)



5

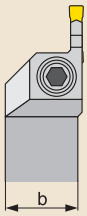
Shank height [mm]



12 = 12 mm
16 = 16 mm
20 = 20 mm
25 = 25 mm
32 = 32 mm

6

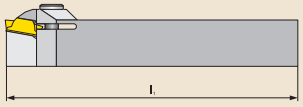
Shank width [mm]



12 = 12 mm
16 = 16 mm
20 = 20 mm
25 = 25 mm
32 = 32 mm

7

Total length

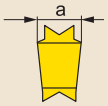


	l_1 [mm]
H	100
J	110
K	125
L	140
E	150
N	160
P	170
Q	180
R	200

	l_1 [in]
A	4.000
B	4.500
C	5.000
D	6.000
E	7.000
F	8.000

8

Insert width



	a [mm]	a [in]
02	2,0	.079
03, 0313 0316	3,0	.118
04, 0413 0416	4,0	.157
05, 0516	5,0	.197
06, 0616	6,0	.236
08, 0830	8,0	.315

5&6

	b [in]	h [in]
05	5/16	5/16
06	3/8	3/8
08	1/2	1/2
10	5/8	5/8

	b [in]	h [in]
12	3/4	3/4
16	1	1
85	1	1 1/4
86	1	1 1/2

	b [in]	h [in]
20	1 1/4	1 1/4
24	1 1/2	1 1/2
32	2	2

For square shanks, this is the number of 16ths of an inch of width and height. For rectangular shanks, the first digit is the number of 8ths of an inch of width, and the second digit is the number of 4ths of an inch of height.

9

Blade curvature direction

Additional information for axial turning.

10

Maximum diameter

Additional information for axial turning.

11

Minimum diameter

Additional information for axial turning.

PRAMET

	1	2	3		4	5	6	7	8
ISO CODE	A	25	S	-	G	G	H	L	0313
ANSI CODE	A	16	S	-	G	G	H	L	0313

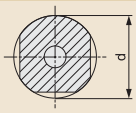
1

Type of tool

Steel with coolant hole

2

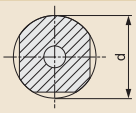
Diameter of shank



	d [mm]
12	12
16	16
20	20
25	25
32	32
40	40

2

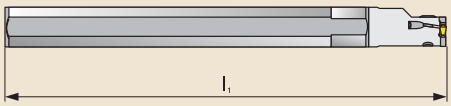
Diameter of shank



	d [in]
08	.500
10	.625
12	.750
16	1.000
20	1.250
24	1.500

3

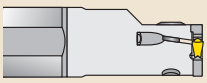
Length of shank



	l_1 [mm]	l_1 [in]
M	150	6.000
P	170	6.250
Q	180	7.250
R	200	8.000
S	250	10.000
T	300	12.000
U	350	14.000
V	400	15.750

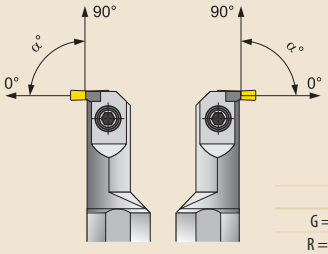
4

Clamping Designation



5

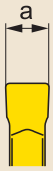
Tool style - cutting edge angle



α	
G = 0°	K = 75°
R = 15°	F = 90°
T = 30°	B = 105°
S = 45°	E = 120°
W = 60°	D = 135°

6

Maximum grooving/turning depth

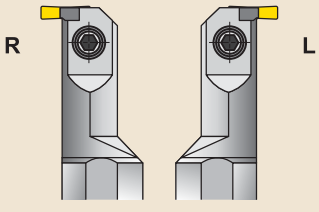


E = 1,0 × a	J = 3,5 × a
F = 1,5 × a	K = 4,0 × a
G = 2,0 × a	L = 4,5 × a
H = 2,5 × a	M = 5,0 × a
I = 3,0 × a	N = 5,5 × a

X = Spezial

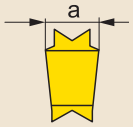
7

Version (right / left)



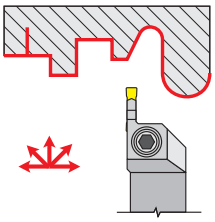
8

Cutting edge length

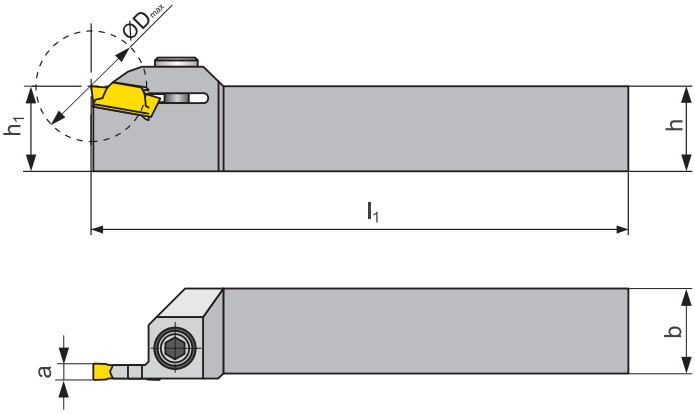


	a [mm]	a [in]
0313	3,0	.118
0413	4,0	.157

GFIR/L, GFKR/L



T137 - T142



TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	Dmax								
GFKR/L 10A 02	● / ●	.625	.625	4.000	.078	1.259						.40	GL03	LCMF 0220..
GFKR/L 12C 02	● / ●	.750	.750	5.000	.078	1.259						.71	GL03	LCMF 0220..
GFKR/L 16D 02	● / ●	1.000	1.000	6.000	.078	1.259						1.50	GL05	LCMF 0220..
GFIR/L 10A 03	● / ●	.625	.625	4.000	.118	.708						.40	GL03	LCM. 0316..
GFIR/L 12C 03	● / ●	.750	.750	5.000	.118	.708						.73	GL03	LCM. 0316..
GFIR/L 16D 03	● / ●	1.000	1.000	6.000	.118	.708						1.57	GL05	LCM. 0316..
GFIR/L 10A 04	● / ●	.625	.625	4.000	.157	.944						.40	GL03	LCM. 0416..
GFIR/L 12C 04	● / ●	.750	.750	5.000	.157	.944						.73	GL03	LCM. 0416..
GFIR/L 16D 04	● / ●	1.000	1.000	6.000	.157	.944						1.54	GL05	LCM. 0416..
GFIR/L 12C 05	● / ●	.750	.750	5.000	.196	1.102						.73	GL03	LCM. 0516..
GFIR/L 16D 05	● / ●	1.000	1.000	6.000	.196	1.102						1.52	GL05	LCM. 0516..
GFIR/L 12C 06	● / ●	.750	.750	5.000	.236	1.102						.73	GL03	LCM. 0616..
GFIR/L 16D 06	● / ●	1.000	1.000	6.000	.236	1.102						1.50	GL05	LCM. 0616..
GFIR/L 16D 08	● / ●	1.000	1.000	7.000	.315	1.890						1.54	GL09	LCM. 0830..
GFIR/L 85E 08	● / ●	1.250	1.000	7.000	.315	1.890						2.20	GL09	LCM. 0830..

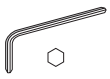
All Dimensions [in]

● stocked as standard /○ not stocked as standard
See price list for current availability.

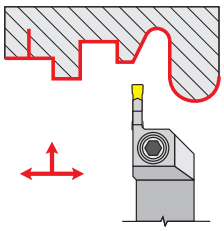
PRAMET

SPARE PARTS

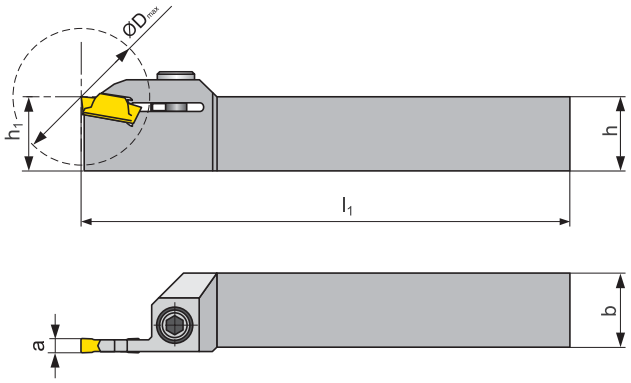
*) See pages T254-T255 for recommended screw torques

Type	Screw* 	Key 				
GL03	HS 0616C	HXK 5				
GL05	HS 0625C	HXK 5				
GL09	HSI 1020	HXK 6				

GFMR/L



T137 - T142



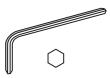
TOOLS FOR EXTERNAL TURNING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	Dmax						
GFMR/L 12C 0316	● / ●	.750	.750	5.000	.118	1.181				.71	GL04	LCM. 0316..
GFMR/L 16D 0316	● / ●	1.000	1.000	6.000	.118	1.181				1.50	GL04	LCM. 0316..
GFMR/L 12C 0416	● / ●	.750	.750	5.000	.158	1.575				.68	GL04	LCM. 0416..
GFMR/L 16D 0416	● / ●	1.000	1.000	6.000	.158	1.575				1.45	GL04	LCM. 0416..
GFMR/L 16D 0516	● / ●	1.000	1.000	6.000	.197	1.969				1.43	GL04	LCM. 0516..
GFMR/L 85E 0516	● / ●	1.250	1.000	7.000	.197	1.969				2.14	GL04	LCM. 0516..
GFMR/L 16D 0616	● / ●	1.000	1.000	6.000	.236	2.362				1.41	GL04	LCM. 0616..
GFMR/L 85E 0616	● / ●	1.250	1.000	7.000	.236	2.362				2.12	GL04	LCM. 0616..
GFMR/L 85E 0830	● / ●	1.250	1.000	7.000	.315	3.150				2.03	GL09	LCM. 0830..

All dimensions [in]

SPARE PARTS

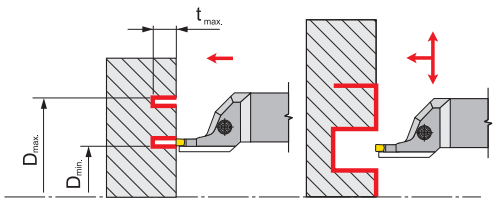
*) See pages T254-T255 for recommended screw torques

Type	Screw*	Key
		
GL04	HS 0620C	HXK 5
GL09	HSI 1020	HXK 6

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

GFIR-L



T137 - T142

TOOLS FOR AXIAL GROOVING & TURNING

Designation	Assortment	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	tmax	Dmin	Dmax				
GFIR 16D 03L 1.18-.670	●	1.000	1.000	6.000	.118	.374	.670	1.180		1.52	GL07	LCM. 0313..
GFIR 16D 03L 1.54-.940	●	1.000	1.000	6.000	.118	.374	.940	1.540		1.52	GL07	LCM. 0313..
GFIR 16D 03L 1.97-1.30	●	1.000	1.000	6.000	.118	.433	1.300	1.970		1.50	GL07	LCM. 0313..
GFIR 16D 03L 2.36-1.69	●	1.000	1.000	6.000	.118	.433	1.690	2.360		1.50	GL07	LCM. 0313..
GFIR 16D 03L 2.99-2.09	●	1.000	1.000	6.000	.118	.433	2.090	2.990		1.50	GL07	LCM. 0313..
GFIR 16D 03L 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.50	GL08	LCM. 0316..
GFIR 16D 03L 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.52	GL08	LCM. 0316..
GFIR 16D 03L 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.50	GL08	LCM. 0316..
GFIR 16D 04L 1.18-.670	●	1.000	1.000	6.000	.158	.374	.670	1.180		1.52	GL07	LCM. 0413..
GFIR 16D 04L 1.34-.826	●	1.000	1.000	6.000	.158	.374	.826	1.340		1.54	GL07	LCM. 0413..
GFIR 16D 04L 1.57-1.02	●	1.000	1.000	6.000	.158	.433	1.020	1.570		1.52	GL07	LCM. 0413..
GFIR 16D 04L 1.97-1.26	●	1.000	1.000	6.000	.158	.433	1.260	1.970		1.52	GL07	LCM. 0413..
GFIR 16D 04L 2.36-1.65	●	1.000	1.000	6.000	.158	.433	1.650	2.360		1.52	GL07	LCM. 0413..
GFIR 16D 04L 2.95-2.05	●	1.000	1.000	6.000	.158	.433	2.050	2.950		1.52	GL07	LCM. 0413..
GFIR 16D 04L 3.94-2.76	●	1.000	1.000	6.000	.158	.472	2.760	3.940		1.50	GL08	LCM. 0416..
GFIR 16D 04L 5.12-3.54	●	1.000	1.000	6.000	.158	.472	3.540	5.120		1.50	GL08	LCM. 0416..
GFIR 16D 04L 6.69-4.33	●	1.000	1.000	6.000	.158	.472	4.330	6.690		1.50	GL08	LCM. 0416..
GFIR 16D 04L 9.06-5.51	●	1.000	1.000	6.000	.158	.472	5.510	9.060		1.50	GL08	LCM. 0416..

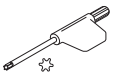
All Dimensions [in]

● stocked as standard / ○ not stocked as standard
See price list for current availability.

GFIR-L

SPARE PARTS

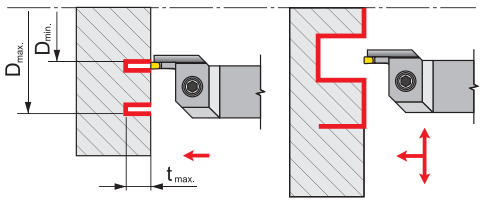
*) See pages T254-T255 for recommended screw torques

Type	Screw* 	Key 				
GL07	US 5018-T20P	FLAG T20P				
GL08	US 6020-T25P	SDR T25P				

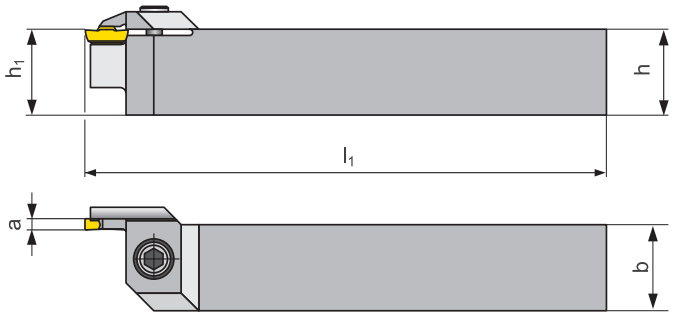
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

GFIL-R



T137 - T142



TOOLS FOR AXIAL GROOVING & TURNING

Designation	Assortment	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	tmax	Dmin	Dmax				
GFIL 16D 03R 1.18-.670	●	1.000	1.000	6.000	.118	.374	.670	1.180		1.52	GL07	LCM. 0313..
GFIL 16D 03R 1.54-.940	●	1.000	1.000	6.000	.118	.374	.940	1.540		1.52	GL07	LCM. 0313..
GFIL 16D 03R 1.97-1.30	●	1.000	1.000	6.000	.118	.433	1.300	1.970		1.50	GL07	LCM. 0313..
GFIL 16D 03R 2.36-1.69	●	1.000	1.000	6.000	.118	.433	1.690	2.360		1.50	GL07	LCM. 0313..
GFIL 16D 03R 2.99-2.09	●	1.000	1.000	6.000	.118	.433	2.090	2.990		1.50	GL07	LCM. 0313..
GFIL 16D 03R 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.50	GL08	LCM. 0316..
GFIL 16D 03R 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.52	GL08	LCM. 0316..
GFIL 16D 03R 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.50	GL08	LCM. 0316..
GFIL 16D 04R 1.18-.670	●	1.000	1.000	6.000	.158	.374	.670	1.180		1.52	GL07	LCM. 0413..
GFIL 16D 04R 1.34-.826	●	1.000	1.000	6.000	.158	.374	.826	1.340		1.54	GL07	LCM. 0413..
GFIL 16D 04R 1.57-1.02	●	1.000	1.000	6.000	.158	.433	1.020	1.570		1.52	GL07	LCM. 0413..
GFIL 16D 04R 1.97-1.26	●	1.000	1.000	6.000	.158	.433	1.260	1.970		1.52	GL07	LCM. 0413..
GFIL 16D 04R 2.36-1.65	●	1.000	1.000	6.000	.158	.433	1.650	2.360		1.52	GL07	LCM. 0413..
GFIL 16D 04R 2.95-2.05	●	1.000	1.000	6.000	.158	.433	2.050	2.950		1.52	GL07	LCM. 0413..
GFIL 16D 04R 3.94-2.76	●	1.000	1.000	6.000	.158	.472	2.760	3.940		1.50	GL08	LCM. 0416..
GFIL 16D 04R 5.12-3.54	●	1.000	1.000	6.000	.158	.472	3.540	5.120		1.50	GL08	LCM. 0416..
GFIL 16D 04R 6.69-4.33	●	1.000	1.000	6.000	.158	.472	4.330	6.690		1.50	GL08	LCM. 0416..
GFIL 16D 04R 9.06-5.51	●	1.000	1.000	6.000	.158	.472	5.510	9.060		1.50	GL08	LCM. 0416..

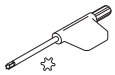
All Dimensions [in]

● stocked as standard / ○ not stocked as standard
See price list for current availability.

GFIL-R

SPARE PARTS

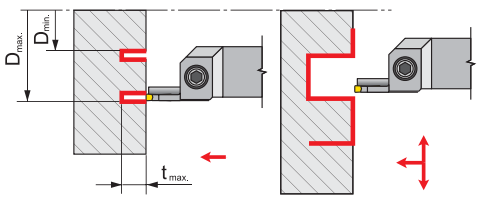
*) See pages T254-T255 for recommended screw torques

Type	Screw* 	Key 				
GL07	US 5018-T20P	FLAG T20P				
GL08	US 6020-T25P	SDR T25P				

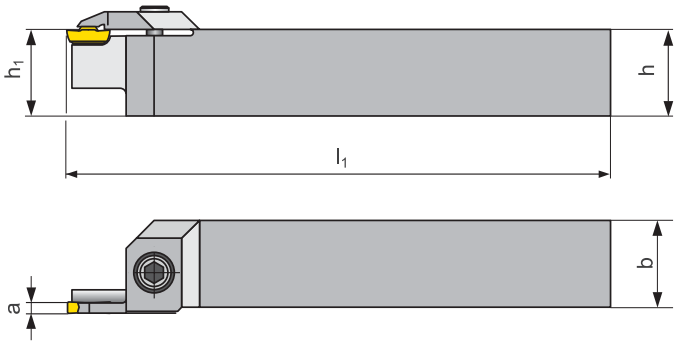
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

GFIR-R



T137 - T142



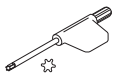
TOOLS FOR AXIAL GROOVING & TURNING

Designation	Assortment	Dimensions h=h1	b	l1	a	tmax	Dmin	Dmax		[lbs]	Spare parts	Inserts
GFIR 16D 0313R 1.18-.670	●	1.000	1.000	6.000	.118	.354	.670	1.180		1.45	GL07	LCM. 0313..
GFIR 16D 0313R 1.54-.940	●	1.000	1.000	6.000	.118	.354	.940	1.540		1.48	GL07	LCM. 0313..
GFIR 16D 0313R 1.97-1.30	●	1.000	1.000	6.000	.118	.354	1.300	1.970		1.50	GL07	LCM. 0313..
GFIR 16D 0313R 2.36-1.69	●	1.000	1.000	6.000	.118	.354	1.690	2.360		1.52	GL07	LCM. 0313..
GFIR 16D 0313R 2.99-2.09	●	1.000	1.000	6.000	.118	.354	2.090	2.990		1.52	GL07	LCM. 0313..
GFIR 16D 0316R 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.54	GL07	LCM. 0316..
GFIR 16D 0316R 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.56	GL07	LCM. 0316..
GFIR 16D 0316R 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.56	GL07	LCM. 0316..

All dimensions [in]

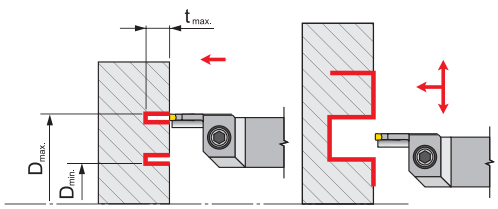
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

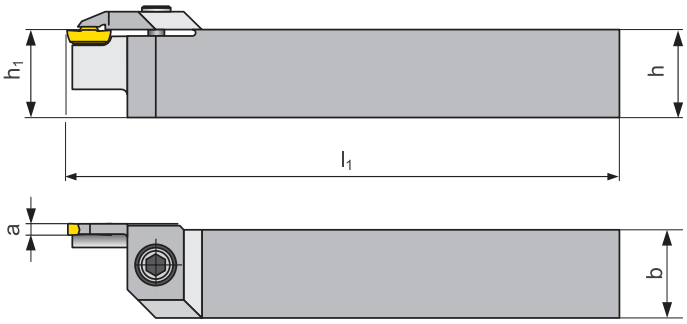
Type	Screw*	Key				
						
GL07	US 5018-T20P	FLAG T20P				

● stocked as standard / ○ not stocked as standard
See price list for current availability.

GFIL-L



T137 - T142



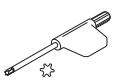
TOOLS FOR AXIAL GROOVING & TURNING

Designation	Assortment	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	tmax	Dmin	Dmax				
GFIL 16D 0313L 1.18-.670	●	1.000	1.000	6.000	.118	.354	.670	1.180		1.45	GL07	LCM. 0313..
GFIL 16D 0313L 1.54-.940	●	1.000	1.000	6.000	.118	.354	.940	1.540		1.48	GL07	LCM. 0313..
GFIL 16D 0313L 1.97-1.30	●	1.000	1.000	6.000	.118	.354	1.300	1.970		1.50	GL07	LCM. 0313..
GFIL 16D 0313L 2.36-1.69	●	1.000	1.000	6.000	.118	.354	1.690	2.360		1.52	GL07	LCM. 0313..
GFIL 16D 0313L 2.99-2.09	●	1.000	1.000	6.000	.118	.354	2.090	2.990		1.52	GL07	LCM. 0313..
GFIL 16D 0316L 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.54	GL07	LCM. 0316..
GFIL 16D 0316L 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.56	GL07	LCM. 0316..
GFIL 16D 0316L 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.56	GL07	LCM. 0316..

All dimensions [in]

SPARE PARTS

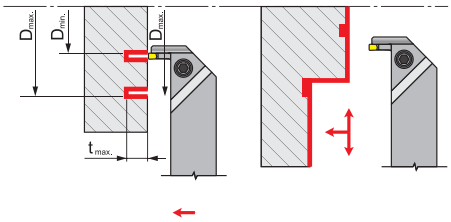
*) See pages T254-T255 for recommended screw torques

Type	Screw*	Key				
						
GL07	US 5018-T20P	FLAG T20P				

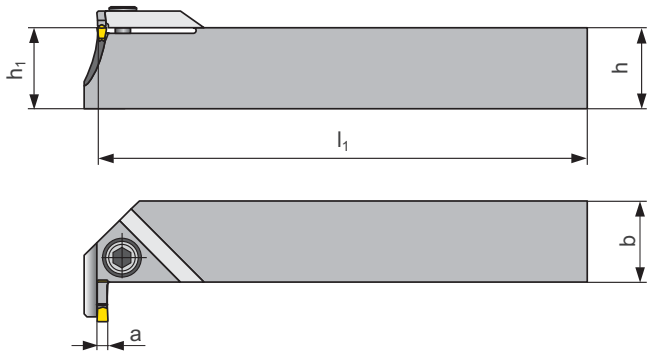
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

GGIR/L - 90°



T137 - T142



TOOLS FOR AXIAL GROOVING & TURNING - 90°

Designation	Assortment	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	a	tmax	Dmin	Dmax				
GGIR 16D 03R 1.18-.670	●	1.000	1.000	6.000	.118	.374	.670	1.180		1.70	GL01	LCM. 0313..
GGIR 16D 03R 1.54-.940	●	1.000	1.000	6.000	.118	.374	.940	1.540		1.70	GL01	LCM. 0313..
GGIR 16D 03R 1.97-1.30	●	1.000	1.000	6.000	.118	.433	1.300	1.970		1.70	GL01	LCM. 0313..
GGIR 16D 03R 2.36-1.69	●	1.000	1.000	6.000	.118	.433	1.690	2.360		1.70	GL01	LCM. 0313..
GGIR 16D 03R 2.99-2.09	●	1.000	1.000	6.000	.118	.433	2.090	2.990		1.70	GL01	LCM. 0313..
GGIR 16D 03R 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.70	GL04	LCM. 0316..
GGIR 16D 03R 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.70	GL04	LCM. 0316..
GGIR 16D 03R 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.70	GL04	LCM. 0316..
GGIL 16D 03L 1.18-.670	●	1.000	1.000	6.000	.118	.374	.670	1.180		1.70	GL01	LCM. 0313..
GGIL 16D 03L 1.54-.940	●	1.000	1.000	6.000	.118	.374	.940	1.540		1.70	GL01	LCM. 0313..
GGIL 16D 03L 1.97-1.30	●	1.000	1.000	6.000	.118	.433	1.300	1.970		1.70	GL01	LCM. 0313..
GGIL 16D 03L 2.36-1.69	●	1.000	1.000	6.000	.118	.433	1.690	2.360		1.70	GL01	LCM. 0313..
GGIL 16D 03L 2.99-2.09	●	1.000	1.000	6.000	.118	.433	2.090	2.990		1.70	GL01	LCM. 0313..
GGIL 16D 03L 3.94-2.76	●	1.000	1.000	6.000	.118	.354	2.760	3.940		1.70	GL04	LCM. 0316..
GGIL 16D 03L 5.12-3.54	●	1.000	1.000	6.000	.118	.354	3.540	5.120		1.70	GL04	LCM. 0316..
GGIL 16D 03L 6.69-4.33	●	1.000	1.000	6.000	.118	.354	4.330	6.690		1.70	GL04	LCM. 0316..

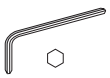
All Dimensions [in]

● stocked as standard / ○ not stocked as standard
See price list for current availability.

GGIR/L - 90°

SPARE PARTS

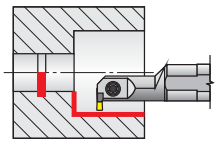
*) See pages T254-T255 for recommended screw torques

Type	Screw* 	Key 				
GL01	HS 0520C	HXK 4				
GL04	HS 0620C	HXK 5				

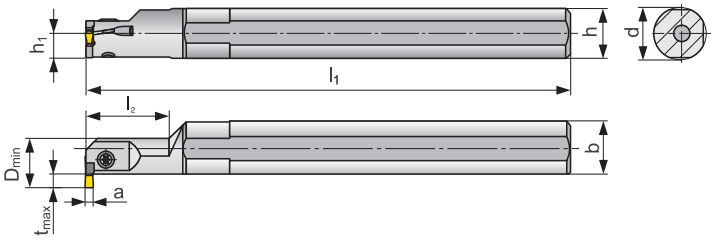
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

GG.R/L



T137 - T142



TOOLS FOR INTERNAL GROOVING & TURNING

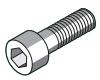
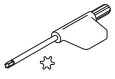
Designation	R/L	Dimensions									[lbs]	Spare parts	Inserts
		d	h	h_1	b	l_1	l_2	a	t_{max}	D_{min}			
A10Q-GGER/L 0313-04	● / ●	.625	.591	.296	.608	7.000	.984	.118	.118	.630	.51	GL06	LCMF 0313….-04
A12R-GGFR/L 0313-04	● / ●	.750	.709	.355	.729	8.000	1.181	.118	.217	.787	.73	GL06	LCMF 0313….-04
A16S-GGHR/L 0313	● / ●	1.000	.906	.453	.953	10.000	1.575	.118	.295	.984	1.70	GL06	LCM. 0313..
A16S-GGFR/L 0413	● / ●	1.000	.906	.453	.953	10.000	1.575	.158	.295	.984	1.70	GL06	LCM. 0413..
A20T-GGHR/L 0413	● / ●	1.250	1.181	.591	1.216	12.000	1.969	.158	.413	1.260	3.41	GL06	LCM. 0413..

All dimensions [in]

**) For inserts with a thickness 4mm

SPARE PARTS

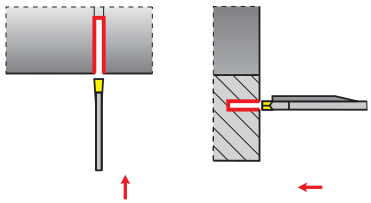
*) See pages T254-T255 for recommended screw torques

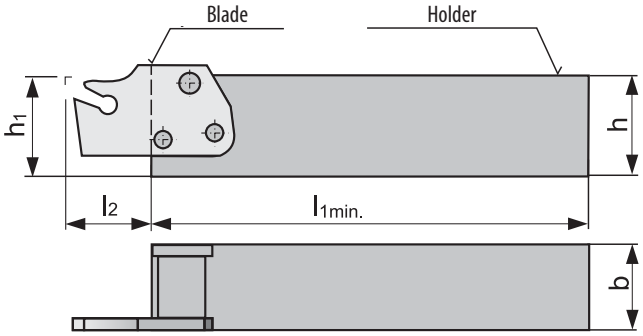
Type	Screw*	Key				
						
GL06	SR 85011-T15P	FLAG T15P				

● stocked as standard / ○ not stocked as standard
See price list for current availability.

MS-EN

MODULAR SYSTEM FOR PARTING AND GROOVING





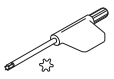
TOOLS FOR PARTING & GROOVING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h=h1	b	l1	l2									
MS-EN-08 A	●	.500	.500	4.000	.591							.29	ND4	XLCF. 16..15...
					.788									XLCF. 16..20...
MS-EN-10 A	●	.625	.625	4.000	.591							.43	ND4	XLCF. 16..15...
					.788									XLCF. 16..20...
MS-EN-12 C	●	.750	.750	5.000	.591							.82	ND5	XLC.. 25..15...
					.984									XLC.. 25..25...
MS-EN-16 D	●	1.000	1.000	6.000	.591							1.65	ND5	XLC.. 25..15...
					.984									XLC.. 25..25...
MS-EN-85 E	●	1.250	1.000	7.000	.591							2.40	ND5	XLC.. 25..15...
					.984									XLC.. 25..25...

All dimensions [in]

SPARE PARTS

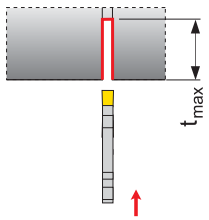
*) See pages T254-T255 for recommended screw torques

Type	Clamping screw*	Clamping screw*	Screwdriver			
						
ND4	3x US 4011-T15P	-	FLAG T15P			
ND5	2x US 45013-T20P	US 46017-T20P	FLAG T20P			

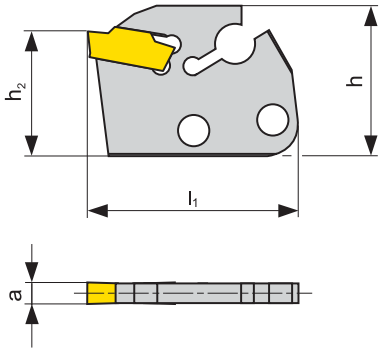
● stocked as standard /○ not stocked as standard
See price list for current availability.

XLCCN

MODULAR SYSTEM FOR PARTING AND GROOVING



T137 - T142



BLADES FOR PARTING & GROOVING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h	h_2	l_1	a	t_{max}								
XLCCN 250215-0316	●	1.142	.945	1.575	.118	.591						.02	-	LCM. 0316..
XLCCN 250225-0316	●	1.142	.945	1.969	.118	.984						.04	-	LCM. 0316..
XLCCN 250315-0416	●	1.142	.945	1.575	.157	.591						.04	-	LCM. 0416..
XLCCN 250325-0416	●	1.142	.945	1.969	.157	.984						.07	-	LCM. 0416..
XLCCN 250425-0516	●	1.142	.945	1.969	.197	.984						.07	-	LCM. 0516..
XLCCN 250525-0616	●	1.142	.945	1.969	.236	.984						.09	-	LCM. 0616..

All dimensions [in]

SPARE PARTS

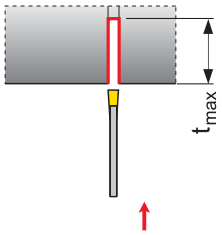
*) See pages T254-T255 for recommended screw torques

Type	Extractor					
-	-					

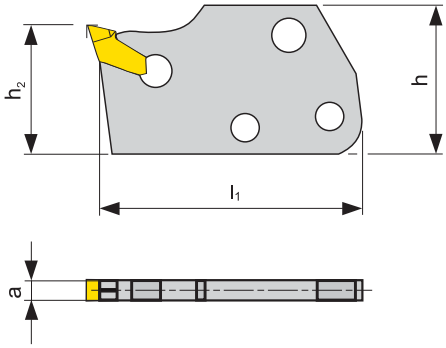
● stocked as standard / ○ not stocked as standard
See price list for current availability.

XLCFN

MODULAR SYSTEM FOR PARTING AND GROOVING



T143



BLADES FOR PARTING & GROOVING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h	h_2	l_1	a	t_{max}								
XLCFN 160215-3.00	●	.984	.472	1.378	.122	.591						.02	KV	LFMX 3.10.....
XLCFN 160220-3.00	●	.984	.472	1.575	.122	.787						.04	KV	LFMX 3.10.....
XLCFN 250215-3.00	●	1.142	.945	1.575	.122	.591						.04	KV	LFMX 3.10.....
XLCFN 250225-3.00	●	1.142	.945	1.969	.122	.984						.04	KV	LFMX 3.10.....
XLCFN 250315-4.00	●	1.142	.945	1.575	.161	.591						.04	KV	LFMX 4.10.....
XLCFN 250325-4.00	●	1.142	.945	1.969	.161	.984						.07	KV	LFMX 4.10.....
XLCFN 250425-5.00	●	1.142	.945	1.969	.201	.984						.09	KV	LFMX 5.10.....
XLCFN 250525-6.35	●	1.142	.945	1.969	.250	.984						.09	KV	LFMX 6.35.....

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

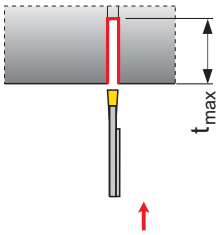
Type	Extractor					
KV	KV 5x70					

PRAMET

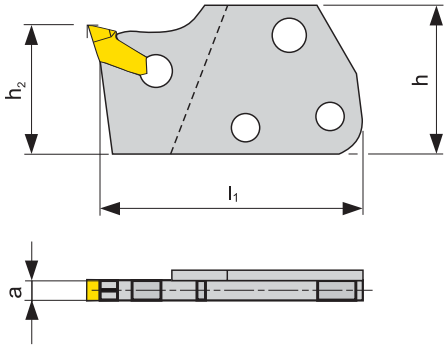
● stocked as standard /○ not stocked as standard
See price list for current availability.

XLCFN/R/L

MODULAR SYSTEM FOR PARTING AND GROOVING



T143



BLADES FOR PARTING & GROOVING

Designation	R/L	Dimensions h	h_2	l_1	a	t_{max}	[lbs]	Spare parts	Inserts
XLCFR/L 160115-1.60	● / ●	.984	.472	1.378	.059 - .063	.591	.02	KV	LFMX 1.50…, LFMX 1.60…
XLCFR/L 160115-2.00	● / ●	.984	.472	1.378	.079-.087	.591	.02	KV	LFMX 2.00..., LFMX 2.20...
XLCFR/L 250115-1.60	● / ●	1.142	.945	1.575	.059 - .063	.591	.02	KV	LFMX 1.50…, LFMX 1.60…
XLCFR/L 250115-2.00	● / ●	1.142	.945	1.575	.079-.087	.591	.02	KV	LFMX 2.00..., LFMX 2.20...

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

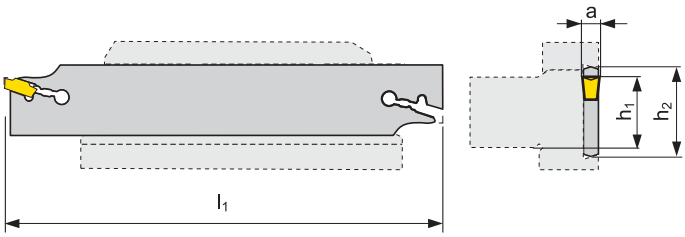
Type	Extractor 
KV	KV 5x70

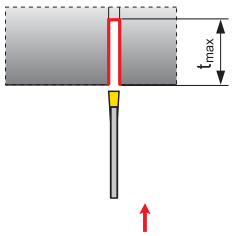
● stocked as standard / ○ not stocked as standard
See price list for current availability.

XLCCN

MODULAR SYSTEM FOR PARTING AND GROOVING

T137 - T142





BLADES FOR PARTING & GROOVING

Designation	Assortment	Dimensions										[lbs]	Spare parts	Inserts
		h_1	h_2	l_1	a	t_{max}								
XLCCN 2602 J 0316	●	.787	1.024	4.331	.118	1.378						.11	KV1	LCM. 0316..
XLCCN 3202 M 0316	●	.984	1.260	5.906	.118	1.969						.18	KV1	LCM. 0316..
XLCCN 3203 M 0416	●	.984	1.260	5.906	.157	1.969						.24	KV1	LCM. 0416..
XLCCN 3204 M 0516	●	.984	1.260	5.906	.197	2.362						.31	KV1	LCM. 0516..
XLCCN 3205 M 0616	●	.984	1.260	5.906	.236	2.362						.37	KV1	LCM. 0616..

All dimensions [in]

SPARE PARTS

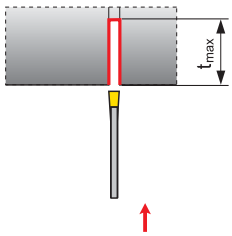
*) See pages T254-T255 for recommended screw torques

Type	Extractor					
KV1	KV 5x100					

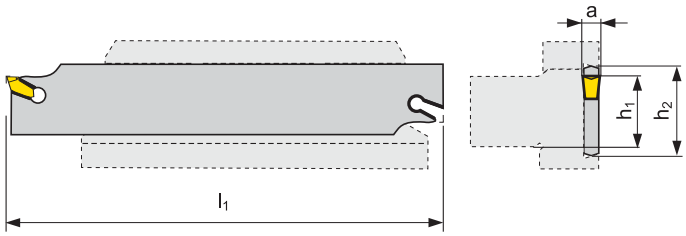
● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

XLCFN



T143



BLADES FOR PARTING & GROOVING

Designation	Assortment	Dimensions					Holder	[lbs]	Spare parts	Inserts
		h_1	h_2	l_1	a	t_{max}				
XLCFN 2601 J 1.60	●	.787	1.024	4.331	.059 - .063	.591	26-D.	.07	KV	LFMX 1.50..., LFMX 1.60...
XLCFN 2601 J 2.00	●	.787	1.024	4.331	.079-.087	.984	26-D.	.09	KV	LFMX 2.00..., LFMX 2.20...
XLCFN 2602 J 3.00	●	.787	1.024	4.331	.122	1.476	26-D.	.11	KV	LFMX 3.10...
XLCFN 2603 J 4.00	●	.787	1.024	4.331	.161	1.575	26-D.	.13	KV	LFMX 4.10...
XLCFN 3201 M 1.60	●	.984	1.260	5.906	.059 - .063	.591	32-D.	.13	KV	LFMX 1.50..., LFMX 1.60...
XLCFN 3201 M 2.00	●	.984	1.260	5.906	.079-.087	.984	32-D.	.15	KV	LFMX 2.00..., LFMX 2.20...
XLCFN 3202 M 3.00	●	.984	1.260	5.906	.122	1.969	32-D.	.18	KV	LFMX 3.10...
XLCFN 3203 M 4.00	●	.984	1.260	5.906	.161	1.969	32-D.	.24	KV	LFMX 4.10...
XLCFN 3204 M 5.00	●	.984	1.260	5.906	.201	2.362	32-D.	.31	KV	LFMX 5.10...
XLCFN 3205 M 6.35	●	.984	1.260	5.906	.250	2.362	32-D.	.37	KV	LFMX 6.35...
XLCFN 4502 S 3.00	●	1.260	1.772	9.843	.122	3.150	45-D.	.26	KV	LFMX 3.10...
XLCFN 4503 S 4.00	●	1.260	1.772	9.843	.161	3.150	45-D.	.42	KV	LFMX 4.10...
XLCFN 4504 S 5.00	●	1.260	1.772	9.843	.201	3.150	45-D.	.62	KV	LFMX 5.10...
XLCFN 4505 S 6.35	●	1.260	1.772	9.843	.250	3.150	45-D.	.88	KV	LFMX 6.35...

All Dimensions

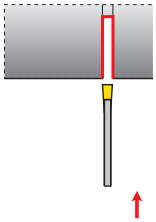
SPARE PARTS

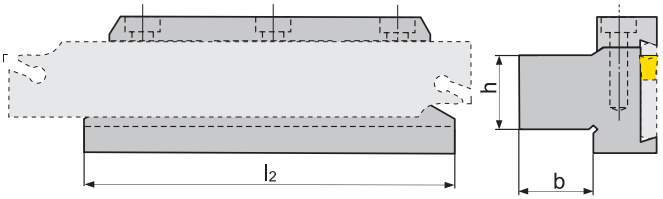
*) See pages T254-T255 for recommended screw torques

Type	Extractor
KV	KV 5x70

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DU





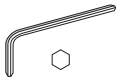
HOLDER FOR EXTERNAL TURNING

Designation	Assortment	Dimensions h	b	l_2						[lbs]	Spare parts	Inserts
26-DU 12	●	.750	.750	3.540						1.15	ND2	XLC.N 26..
32-DU 74	●	1.000	.875	4.330						1.88	ND2	XLC.N 32..
32-DU 104	●	1.000	1.250	4.330						2.32	ND2	XLC.N 32..
32-DU 95	●	1.250	1.125	4.330						2.32	ND2	XLC.N 32..
45-DU 95	●	1.250	1.125	4.330						2.98	ND7	XLC.N 45..
45-DU 24	●	1.500	1.500	4.330						3.90	ND7	XLC.N 45..

All dimensions [in]

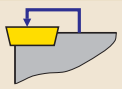
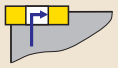
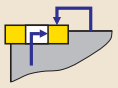
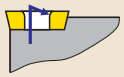
SPARE PARTS

*) See pages T254-T255 for recommended screw torques

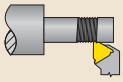
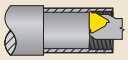
Type	Clamping screw*	Key
		
ND2	HS 0625	HXK 5
ND7	HS 0630	HXK 5

● stocked as standard /○ not stocked as standard
See price list for current availability.

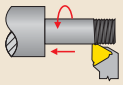
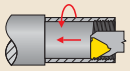
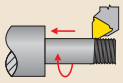
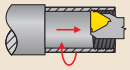
1 Clamping Designation

C	
P	
M	
S	

2 External/Internal

E	external	
I	internal	

3 Direction of cut

R - Right	external	
	internal	
L - Left	external	
	internal	

4 Type of construction

-	normal
S	special

ISO CODE

1	2	3		4	5	6	7		8
S	E	R	-	S	2525	M	16	-	

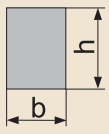
ANSI CODE

1	2	3		4	5	6	7		8
S	E	R	-	S	16	D	16	-	

5 Tool dimensions [mm]

External turning	2525	25 x 25 mm
Internal turning	1416	shank width - 16 mm

5

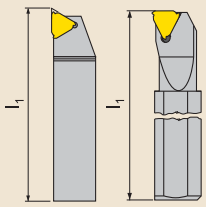


	b [in]	h [in]		b [in]	h [in]
10	5/8	5/8	85	1	1 1/4
12	3/4	3/4	86	1	1 1/2
16	1	1	20	1 1/4	1 1/4

For square shanks, this is the number of 16ths of an inch of width and height. For rectangular shanks, the first digit is the number of 8ths of an inch of width, and the second digit is the number of 4ths of an inch of height.

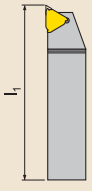
	d [in]		d [in]
08	.500	16	1.000
10	.625	20	1.250
12	.750	24	1.500

6 Total Length

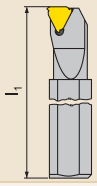


	l_1 [mm]
K	125
L	140
M	150
N	160
P	170
Q	180
R	200
S	250
T	300

6



	l_1 [in]
C	5.000
D	6.000
E	7.000
F	8.000



	l_1 [in]
K	5.000
M	6.000
P	6.250
Q	7.250
R	8.000
S	10.000
T	12.000
U	14.000

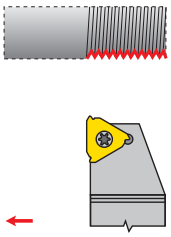
7 Insert dimensions [mm]

d = I.C.		T
[mm]	[in]	
6,350	1/4	11
9,525	3/8	16
12,700	1/2	22

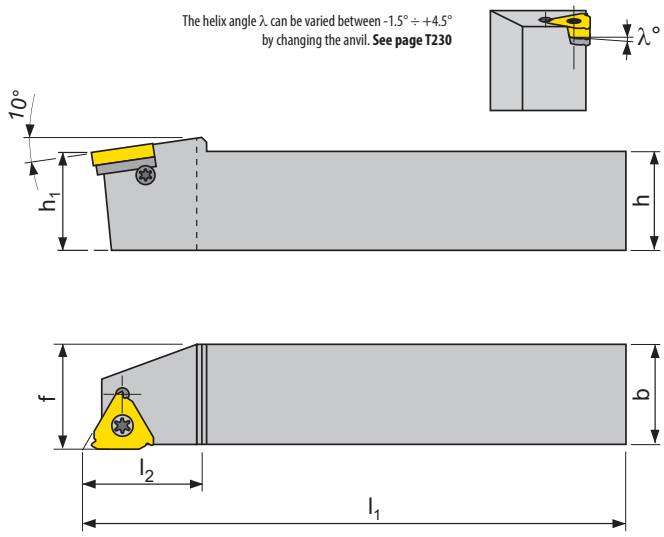
8

	Helix angle λ
0	Helix angle λ = 0°
1	Helix angle λ = 1°
2	Helix angle λ = 2°

SER/L



T144-T147



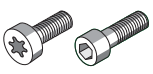
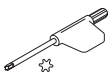
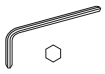
TOOLS FOR EXTERNAL THREADING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	l2	f						
SER/L 12 C16	● / ●	.750	.750	5.000	.900	.750				.77	Z12	TN 16ER/L..
SER/L 16 D16	● / ●	1.000	1.000	6.000	.950	1.000				1.54	Z12	TN 16ER/L..
SER/L 85 D16	● / ●	1.250	1.000	6.000	1.000	1.000				1.98	Z12	TN 16ER/L..
SER/L 16 D22	● / ●	1.000	1.000	6.000	1.000	1.000				1.54	Z13	TN 22ER/L..
SER/L 85 D22	● / ●	1.250	1.000	6.000	1.000	1.000				1.98	Z13	TN 22ER/L..

All dimensions [in]

SPARE PARTS

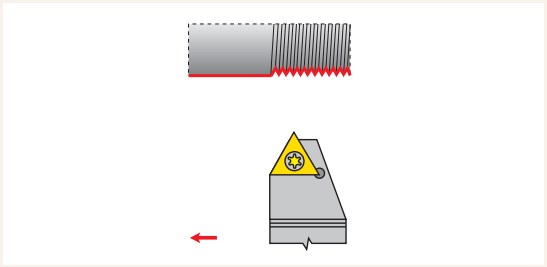
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim screw	Screwdriver	Key	Shim	
						
Z12	US 3512A-T15P	HS 0304	FLAG T15P	HXK 2,5	str. T230	
Z13	US 4514A-T20	SP 0405	FLAG T20	-	str. T230	

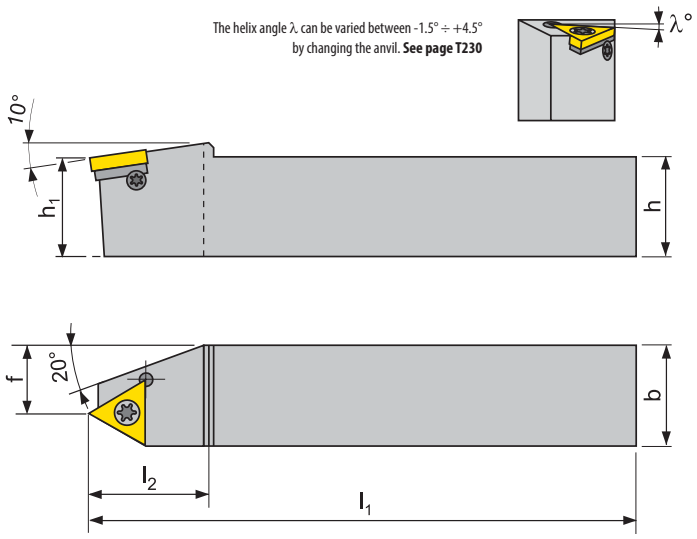
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

SER/L-S



T144-T147



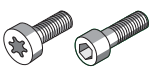
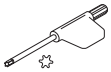
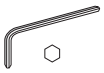
TOOLS FOR EXTERNAL THREADING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		h=h1	b	l1	l2	f						
SER/L-S 16 D22	● / ●	1.000	1.000	6.000	1.200	.575				.77	Z13	TN 22EN..
SER/L-S 85 D22	● / ●	1.250	1.000	6.000	1.200	.575				1.54	Z13	TN 22EN..

All dimensions [in]

SPARE PARTS

*) See pages T254-T255 for recommended screw torques

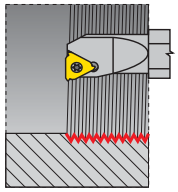
Type	Clamp. screw*	Shim screw	Screwdriver	Key	Shim	
						
Z13	US 4514A-T20	SP 0405	FLAG T20	-	str. T230	

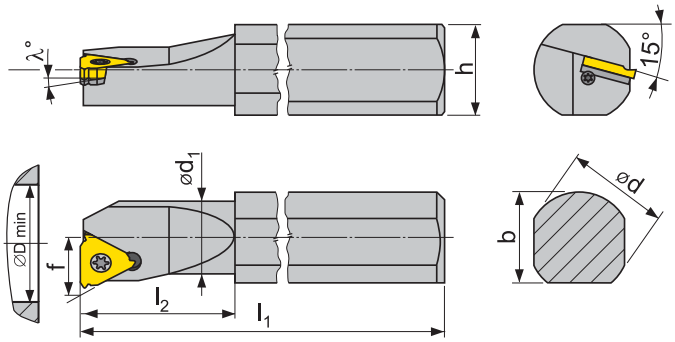
● stocked as standard / ○ not stocked as standard
See price list for current availability.

SIR/L

T 144-T147

The helix angle λ can be varied between -1.5° ÷ +4.5° by changing the anvil. **See page T230**





TOOLS FOR INTERNAL THREADING

Designation	R/L	Dimensions b	d	D_{min}	h	l_1	l_2	d_1	f	[lbs]	Spare parts	Inserts
SIR/L 10 K11-0	● / ●	.570	.625	.500	.550	5.000	1.000	.380	.295	.33	Z11	TN 11NR/L.
SIR/L 10 K11-1	● / ●	.570	.625	.500	.550	5.000	1.000	.380	.295	.33	Z11	TN 11NR/L.
SIR/L 10 M11-0	● / ●	.570	.625	.630	.550	6.000	1.250	.500	.350	.44	Z11	TN 11NR/L..
SIR/L 10 M11-1	● / ●	.570	.625	.630	.550	6.000	1.250	.500	.350	.44	Z11	TN 11NR/L..
SIR/L 10 M16-0	● / ●	.550	.625	.850	.550	6.000	-		.450	.44	Z9	TN 16NR/L..
SIR/L 10 M16-1	● / ●	.550	.625	.850	.550	6.000	-		.450	.44	Z9	TN 16NR/L..
SIR/L 10 M16-2**	● / ●	.550	.625	.650	.550	6.000	1.500	.600	.430	.44	Z10	TN 16NR/L..
SIR/L 12 P16	● / ●	.700	.750	.850	.700	6.250	-		.500	.66	Z12	TN 16NR/L..
SIR/L 16 Q16	● / ●	.900	1.000	1.150	.900	7.250	-		.650	1.37	Z12	TN 16NR/L..
SIR/L 20 S16	● / ●	1.200	1.250	1.400	1.000	10.000	-		.760	2.98	Z12	TN 16NR/L..
SIR/L 20 S22	● / ●	1.200	1.250	1.450	1.000	10.000	-		.850	2.98	Z13	TN 22NR/L..
SIR/L 20 S22-2**	● / ●	1.200	1.250	1.000	1.000	10.000	3.000	.950	.650	2.43	Z14	TN 22NR/L..
SIR/L 24 T22	● / ●	1.250	1.500	1.750	1.450	12.000	-		.950	5.18	Z13	TN 22NR/L..

***) With internal cooling*

All Dimensions

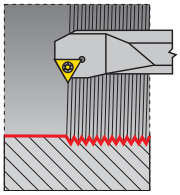
SPARE PARTS

**) See pages T254-T255 for recommended screw torques*

Type	Clamp. screw*	Shim screw	Screwdriver	Key	Shim	
Z9	US 3510A-T15P	-	FLAG T15P	-	P-16	
Z10	US 3510A-T15P	-	FLAG T15P	-	-	
Z11	US 2506-T07P	-	FLAG T07P	-	-	
Z12	US 3512A-T15P	HS 0304	FLAG T15P	HXK 2,5	str. T230	
Z13	US 4514A-T20	SP 0405	FLAG T20	-	str. T230	
Z14	US 4514A-T20	-	FLAG T20	-	-	

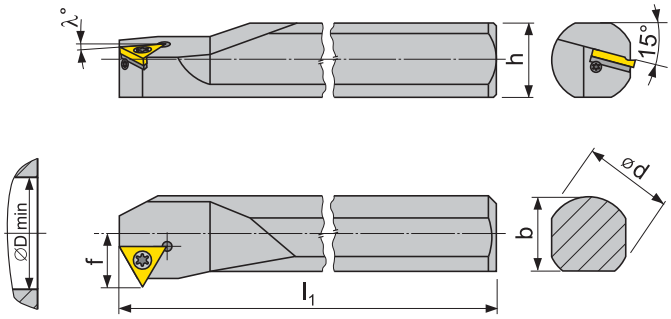
● stocked as standard /○ not stocked as standard
See price list for current availability.

SIR/L-S



T144-T147

The helix angle λ can be varied between -1.5° ÷ +4.5° by changing the anvil. **See page T230**



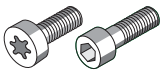
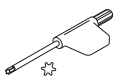
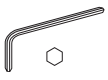
TOOLS FOR INTERNAL THREADING

Designation	R/L	Dimensions								[lbs]	Spare parts	Inserts
		b	d	D_{min}	h	l_1	l_2	d_1	f			
SIR/L-S 20 S22	● / ●	1.200	1.250	1.550	1.000	10.000	-	-	.880	2.86	Z13	TN 22NN..
SIR/L-S 24 T22	● / ●	1.250	1.500	1.800	1.450	12.000	-	-	1.020	5.07	Z13	TN 22NN..

All Dimensions

SPARE PARTS

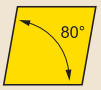
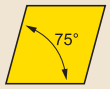
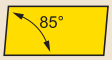
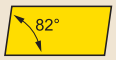
*) See pages T254-T255 for recommended screw torques

Type	Clamp. screw*	Shim screw	Screwdriver	Key	Shim	
						
Z13	US 4514A-T20	SP 0405	FLAG T20	-	str. T230	

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DESIGNATION CODE - INSERTS

1 – Insert shape

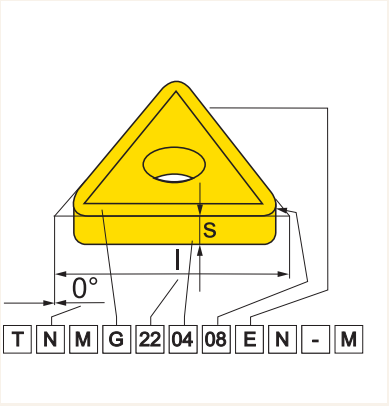
 H	 O	 P	 R
 S	 T	 C	 D
 E	 M	 V	 W
 L	 A	 B	 K

2 – Clearance angle

 A	 B
 C	 D
 E	 F
 G	 N
 P	Special O

4 – Insert type

 N	 R
 F	 A
 M	 G
 W	 T
 Q	Special X



CODE

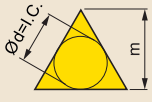
1	2	3	4
T	N	U	N
T	N	M	G

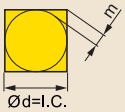
ANSI CODE

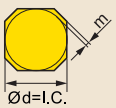
1	2	3	4
T	N	U	N
T	N	M	G

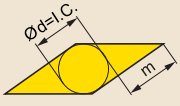
3 – Tolerances

Symbol	Tolerances [mm]			Tolerances [In]		
	m (±)	s (±)	d = I.C. (±)	m (±)	s (±)	d = I.C. (±)
A	0,005	0,025	0,025	0,0002	0,001	0,0010
F	0,005	0,025	0,013	0,0002	0,001	0,0005
C	0,013	0,025	0,025	0,0005	0,001	0,0010
H	0,013	0,025	0,013	0,0005	0,001	0,0005
E	0,025	0,025	0,025	0,0010	0,001	0,0010
G	0,025	0,130	0,025	0,0010	0,005	0,0010
J	0,005	0,025	0,05 ÷ 0,13	0,0002	0,001	0,002 ÷ 0,005
K	0,013	0,025	0,05 ÷ 0,13	0,0005	0,001	0,002 ÷ 0,005
L	0,025	0,025	0,05 ÷ 0,13	0,0010	0,001	0,002 ÷ 0,005
M	0,08 ÷ 0,18	0,130	0,05 ÷ 0,13	0,003 ÷ 0,007	0,005	0,002 ÷ 0,005
N	0,08 ÷ 0,18	0,025	0,05 ÷ 0,13	0,003 ÷ 0,007	0,001	0,002 ÷ 0,005
U	0,05 ÷ 0,38	0,130	0,08 ÷ 0,25	0,005 ÷ 0,015	0,005	0,003 ÷ 0,010









PRAMET

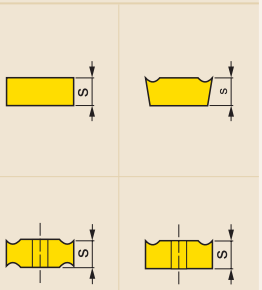
5

Cutting edge length

d=I.C.		R	S	T	C	D	E	V	W
mm									
3,97	5/32"			06				07	02
5,00		05							
5,56	7/32"			09			05		03
6,00		06							
6,35	1/4"			11	06	07			04
7,94	5/16"				08		08	13	
8,00		08							
9,525	3/8"	09	09	16	09	11		16	06
10,0		10							
12,0		12							
12,7	1/2"	12	12	22	12	15			08
15,875	5/8"	15	15	27	16				
16,0		16							
19,05	3/4"	19	19	33	19				
20,0		20							
25,0		25							
25,4	1"	25	25		25				
31,75	1 1/4"	31							
32,0		32							
38,1	1 1/2"		38						

6

Thickness



Symb.	s	
	mm	In
01	1,59	1/16"
T1	1,98	5/64"
02	2,38	3/32"
03	3,18	1/8"
T3	3,97	5/32"
04	4,76	3/16"
05	5,56	7/32"
06	6,35	1/4"
07	7,94	5/16"
09	9,52	3/8"

7

Nose radius

Symb.	r_ε mm	In
00	0	0"
02	0,2	1/128"
04	0,4	1/64"
08	08	1/32"
12	1,2	3/64"
16	1,6	1/16"
24	2,4	3/32"
32	3,2	1/8"

Round inserts

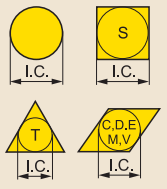
d=I.C.	Symb.
In	00
mm	M0

5	6	7	8	9		10
22	04	08				
22	04	08	E	N	-	M

5A	6A	7A	8	9		10
4	3	2				
4	3	2	E	N	-	M

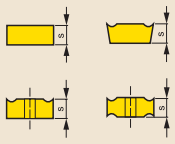
ANSI CODE

Inscribed circle



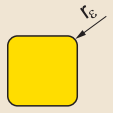
Symb.	d = I.C.	
	mm	In
1	3,175	1/8"
1.2	3,969	5/32"
1.5	4,763	3/16"
1.8	5,556	7/32"
2	6,350	1/4"
2.5	7,938	5/16"
3	9,525	3/8"
4	12,700	1/2"
5	15,875	5/8"
6	19,050	3/4"
7	22,225	7/8"
8	25,400	1"
10	31,750	1-1/4"

Thickness



Symb.	s	
	mm	In
1	1,588	1/16"
1.2	1,984	5/64"
1.5	2,381	3/32"
2	3,175	1/8"
2.5	3,969	5/32"
3	4,763	3/16"
3.5	5,556	7/32"
4	6,350	1/4"
5	7,938	5/16"
6	9,525	3/8"
7	11,113	7/16"
8	12,700	1/2"
9	14,288	9/16"
10	15,875	5/8"

Nose radius



Symb.	r_ε mm	In
0	0,050	1/512"
0.2	0,099	1/256"
0.5	0,198	1/128"
1	0,397	1/64"
2	0,794	1/32"
3	1,191	3/64"
4	1,588	1/16"
5	1,984	5/64"
6	2,381	3/32"
7	2,778	7/64"
8	3,175	1/8"
10	3,969	5/32"
12	4,763	3/16"
14	5,556	7/32"
16	6,350	1/4"
x	Other	Other

8

Cutting edge design

F	Sharp edges	E	Rounded edges
T	Edges with facet	S	Rounded edges with facet
K	Edges with double facet	P	Rounded edges with double facet

9

Feed direction

R	Feed	N	
L	Feed		Feed Feed

10

Chip breaker designation

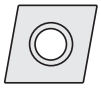
CCGT

T88

CCMT

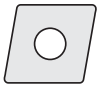
T89

CCMW



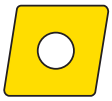
T90

CNMA



T91

CNMG

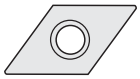


T92 - T93

CNMM

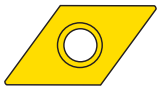
T94 - T95

DCGT



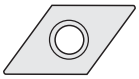
T95

DCMT



T96

DCMW



T97

DNMA

T97

DNMG

T98 -T99

DNMM

T100

RCGT

T101

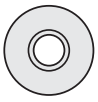
RCMH

T101

RCMT

T102

RCMW



T103

RCMX

T104

RNMG

T105

SCGT

T105

SCMT

T106

SCMW

T107

SNMA

T108

SNMG

T109

SNMM

T110 - T111

TCGT

T112

TCMT

T113

TCMW

T114

TNMA

T115

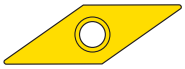
TNMG

T116 - T117

TNMM

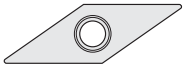
T118

VBMT



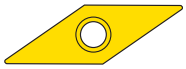
T119

VCGT



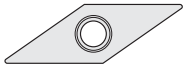
T120

VCMT



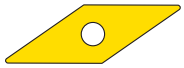
T121

VCMW



T122

VNMG



T123

WCGT

T124

WCMT

T125

WNMA

T126

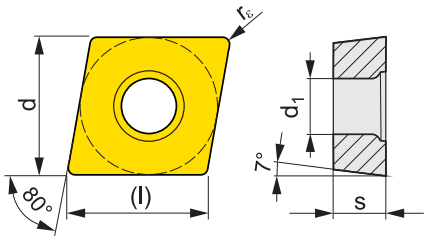
WNMG

T127 - T128

WNMM

T129

CCGT



Dimensions	(l)	d	d_1	s		
21.5	.252	1/4	.110	3/32		
32.5	.382	3/8	.173	5/32		
43	.508	1/2	.217	3/16		

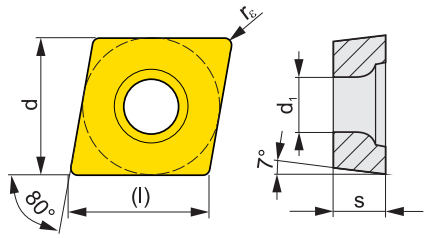
All dimensions [in]

For tools see pages: T37, T48

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T8330	HF7														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CCGT 21.50.5F-AL		●														1/128	.002	.006	.012	.118
	CCGT 21.51F-AL		●														1/64	.004	.012	.016	.138
	CCGT 32.50.5F-AL		●														1/128	.004	.006	.012	.157
	CCGT 32.51F-AL		●														1/64	.004	.012	.016	.177
	CCGT 32.52F-AL		●														1/32	.006	.024	.031	.197
	CCGT 431F-AL		●														1/64	.004	.012	.016	.276
	CCGT 432F-AL		●														1/32	.006	.024	.031	.276
	CCGT 21.50.5R-SI	●															1/128	.003	.006	.016	.063
	CCGT 21.51R-SI	●															1/64	.003	.010	.020	.059
	CCGT 32.51R-SI	●															1/64	.006	.012	.031	.079
	CCGT 432R-SI	●															1/32	.009	.017	.039	.157
	CCGT 21.50.5L-SI	●															1/128	.003	.006	.016	.063
	CCGT 21.51L-SI	●															1/64	.003	.010	.020	.059
	CCGT 32.51L-SI	●															1/64	.006	.012	.031	.079
	CCGT 432L-SI	●															1/32	.009	.017	.039	.157

● stocked as standard /○ not stocked as standard
See price list for current availability.

CCMT



Dimensions	(l)	d	d_1	s		
21.5	.252	1/4	.114	3/32		
32.5	.382	3/8	.177	5/32		
43	.508	1/2	.220	3/16		

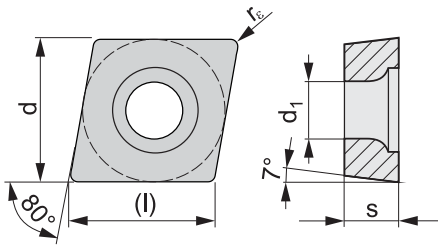
All dimensions [in]

For tools see pages: T37, T48

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CCMT 21.50.5-FF**							●	●							1/128	.002	.006	.008	.079
	CCMT 21.51-FF							●	●							1/64	.002	.009	.016	.079
	CCMT 32.51-FF							●	●							1/64	.002	.009	.016	.079
	**CCMT 21.50.5-FM**			●			●	●	●							1/128	.003	.006	.008	.039
	CCMT 21.51-FM			●		●	●	●	●							1/64	.003	.008	.016	.059
	CCMT 21.52-FM					●	●		●							1/32	.005	.012	.031	.079
	CCMT 32.50.5-FM			●			●	●	●							1/128	.002	.006	.008	.118
	CCMT 32.51-FM			●		●	●	●	●							1/64	.004	.012	.016	.118
	CCMT 32.52-FM			●		●	●	●	●							1/32	.006	.014	.031	.118
	CCMT 431-FM			●		●	●	●	●							1/64	.004	.012	.016	.157
	CCMT 432-FM			●		●	●	●	●							1/32	.006	.014	.031	.157
	CCMT 433-FM					●	●		●							3/64	.006	.018	.047	.157
	**CCMT 32.51-RM**	●	●	●		●	●		●							1/64	.006	.012	.039	.157
	CCMT 32.52-RM	●	●	●		●	●		●							1/32	.008	.016	.059	.157
	CCMT 432-RM	●	●	●		●	●		●							1/32	.008	.016	.059	.177
	CCMT 433-RM					●	●		●							3/64	.008	.020	.059	.177
	**CCMT 21.50.5-UR**			●			●	●	●	●						1/128	.003	.006	.008	.079
	CCMT 21.51-UR		●	●		●	●	●	●	●						1/64	.003	.012	.016	.079
	CCMT 21.51W-UR									●						1/64	.003	.012	.016	.079
	CCMT 21.52-UR		●			●	●		●							1/32	.003	.020	.031	.079
	CCMT 32.50.5-UR									●						1/128	.003	.006	.008	.118
	CCMT 32.51-UR		●	●	●	●	●	●	●	●						1/64	.003	.012	.016	.118
	CCMT 32.52-UR		●	●	●	●	●	●	●	●						1/32	.003	.020	.031	.118
	CCMT 32.52W-UR									●						1/32	.003	.020	.031	.118
	CCMT 431-UR		●			●	●		●							1/64	.003	.012	.016	.118
	CCMT 432-UR		●	●		●	●		●							1/32	.003	.020	.031	.157
	CCMT 433-UR		●			●	●		●							3/64	.003	.020	.047	.157

● stocked as standard / ○ not stocked as standard
See price list for current availability.

CCMW



Dimensions	(l)	d	d_1	s		
21.5	.252	1/4	.110	3/32		
32.5	.382	3/8	.173	5/32		
43	.508	1/2	.217	3/16		

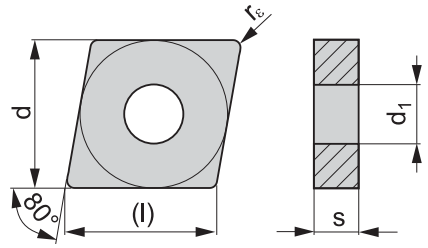
All dimensions [in]

For tools see pages: T37, T48

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CCMW 21.50.5**	●															1/128	.004	.006	.008	.165
	CCMW 21.51	●															1/64	.004	.012	.016	.165
	CCMW 32.51	●															1/64	.004	.012	.016	.248
	CCMW 32.52	●															1/32	.004	.014	.031	.248
	CCMW 431	●															1/64	.004	.012	.016	.331
	CCMW 432	●															1/32	.004	.016	.031	.331

● stocked as standard /○ not stocked as standard
See price list for current availability.

CNMA



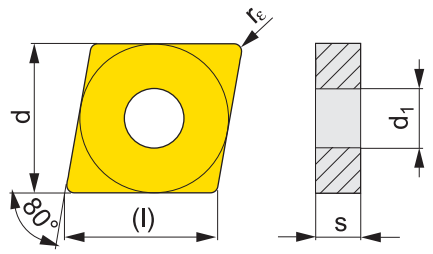
Dimensions	(l)	d	d_1	s		
43	.508	1/2	.203	3/16		
54	.634	5/8	.250	1/4		
64	.760	3/4	.313	1/4		

All dimensions [in]

For tools see pages: T16-T18, T31

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CNMA 431	●															1/64	.004	.012	.016	.331
	CNMA 432	●	●														1/32	.004	.024	.031	.331
	CNMA 433	●	●														3/64	.004	.024	.047	.331
	CNMA 434	●															1/16	.004	.024	.063	.331
	CNMA 543	●															3/64	.004	.024	.047	.335
	CNMA 643	●															3/64	.004	.035	.047	.500
	CNMA 644	●															1/16	.004	.035	.063	.500
	CNMA 432S	●															1/32	.004	.024	.031	.331
	CNMA 433S	●															3/64	.004	.024	.063	.331
	CNMA 543S	●															3/64	.004	.024	.047	.335
	CNMA 644S	●															1/16	.004	.035	.063	.500

CNMG



Dimensions	(l)	d	d_1	s		
32	.382	3/8	.150	1/8		
43	.508	1/2	.203	3/16		
54	.634	5/8	.250	1/4		
64	.760	3/4	.313	1/4		
86	1.016	1	.359	3/8		

All dimensions [in]

For tools see pages: T16-T18, T31

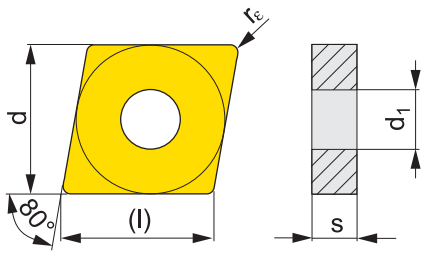
Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310					r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CNMG 431-FF**								●							1/64	.002	.006	.016	.059
	CNMG 432-FF								●							1/32	.003	.008	.031	.059
	**CNMG 321-FM**					●	●			●						1/64	.004	.012	.020	.248
	CNMG 322-FM					●	●			●						1/32	.004	.018	.031	.118
	CNMG 431-FM			●	●	●	●		●	●	●					1/64	.004	.012	.020	.118
	CNMG 432-FM			●	●	●	●		●	●	●					1/32	.006	.018	.031	.118
	CNMG 433-FM					●	●									3/64	.006	.018	.047	.157
	**CNMG 433-KR**	●	●													3/64	.010	.028	.047	.276
	**CNMG 322-M**					●	●	●								1/32	.006	.024	.031	.157
	CNMG 431-M		●		●	●	●	●								1/64	.007	.012	.031	.236
	CNMG 432-M	●	●		●	●	●	●		●						1/32	.007	.024	.031	.236
	CNMG 433-M	●	●		●	●	●	●								3/64	.007	.031	.047	.236
	CNMG 434-M	●					●	●								1/16	.007	.031	.063	.236
	CNMG 542-M				●	●	●	●								1/32	.007	.024	.031	.276
	CNMG 543-M					●	●	●								3/64	.007	.024	.047	.276
	CNMG 544-M						●	●								1/16	.007	.024	.063	.276
	CNMG 642-M					●	●	●								1/32	.007	.024	.031	.315
	CNMG 643-M				●	●	●	●								3/64	.007	.031	.047	.315
	CNMG 644-M				●	●	●	●								1/16	.007	.031	.063	.315
	**CNMG 432-R**	●				●	●	●								1/32	.010	.024	.079	.236
	CNMG 433-R	●				●	●	●								3/64	.010	.028	.079	.236
	CNMG 543-R	●				●	●									3/64	.010	.028	.118	.276
	CNMG 544-R	●														1/16	.010	.028	.118	.276
	CNMG 643-R	●					●	●								3/64	.010	.028	.118	.315
	CNMG 644-R	●				●	●	●								1/16	.010	.028	.079	.354

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CNMG 432-RM**	●	●		●	●	●	●	●	●							1/32	.008	.020	.039	.276
	CNMG 433-RM	●	●		●	●	●	●	●	●							3/64	.010	.028	.059	.276
	CNMG 434-RM	●	●		●	●	●	●		●							1/16	.012	.030	.079	.276
	CNMG 542-RM	●	●			●	●	●		●							1/32	.008	.020	.039	.315
	CNMG 543-RM	●	●		●	●	●	●		●							3/64	.010	.028	.059	.315
	CNMG 544-RM	●	●		●	●	●	●									1/16	.012	.031	.079	.315
	CNMG 642-RM	●	●			●	●	●									1/32	.008	.020	.039	.394
	CNMG 643-RM	●	●		●	●	●	●		●							3/64	.010	.028	.059	.394
	CNMG 644-RM	●	●		●	●	●	●									1/16	.012	.031	.079	.394
	CNMG 866-RM					●	●	●									3/32	.016	.039	.098	.591
	**CNMG 432W-F**		●			●	●										1/32	.004	.024	.031	.173
	**CNMG 432W-M**		●			●	●										1/32	.006	.024	.031	.157
	CNMG 433W-M		●			●	●										3/64	.008	.035	.047	.157
	**CNMG 431-NM**			●			●			●							1/64	.006	.012	.020	.118
	CNMG 432-NM			●			●			●							1/32	.008	.016	.031	.118
	CNMG 433-NM			●			●			●							3/64	.008	.016	.047	.138
	CNMG 542-NM			●			●			●							1/32	.010	.020	.031	.197
	CNMG 543-NM			●			●										3/64	.010	.020	.047	.197
	CNMG 643-NM			●			●			●							3/64	.012	.020	.047	.315
	**CNMG 431R-SI**			●			●			●							1/64	.008	.012	.031	.197
	CNMG 432R-SI			●			●			●							1/32	.008	.020	.031	.197
	**CNMG 431L-SI**			●			●			●							1/64	.008	.012	.031	.197
	CNMG 432L-SI			●			●			●							1/32	.008	.020	.031	.197

CNMM



Dimensions	(l)	d	d_1	s		
43	.508	1/2	.203	3/16		
54	.634	5/8	.250	1/4		
64	.760	3/4	.313	1/4		
86	1.016	1	.359	3/8		

All dimensions [in]

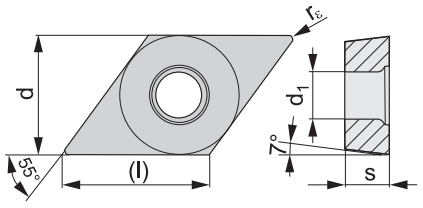
For tools see pages: T16-T18, T31

Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	T8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CNMM 543-DR			●	●			3/64	.012	.033	.098	.354
	CNMM 642-DR			●	●			1/32	.012	.024	.098	.354
	CNMM 643-DR			●	●			3/64	.012	.033	.098	.354
	CNMM 644-DR			●	●			1/16	.012	.033	.098	.354
	CNMM 644-HR			●	●		●	1/16	.020	.047	.197	.524
	CNMM 646-HR			●	●		●	3/32	.020	.055	.197	.524
	CNMM 866-HR			●	●		●	3/32	.020	.055	.197	.551
	CNMM 432-NR	●		●		●		1/32	.010	.024	.039	.331
	CNMM 433-NR	●		●		●		3/64	.010	.031	.047	.331
	CNMM 432-NR2	●		●		●		1/32	.010	.022	.031	.295
	CNMM 433-NR2	●		●		●		3/64	.011	.028	.047	.295
	CNMM 542-NR2	●		●		●		1/32	.012	.024	.039	.374
	CNMM 543-NR2	●		●		●		3/64	.014	.026	.059	.374
	CNMM 544-NR2	●		●				1/16	.014	.031	.079	.374
	CNMM 643-NR2	●		●		●		3/64	.014	.035	.059	.472
	CNMM 644-NR2	●		●		●		1/16	.016	.039	.079	.472
	CNMM 646-NR2	●		●				3/32	.016	.047	.098	.472
	CNMM 866-NR2	●		●		●		3/32	.020	.063	.118	.630
	CNMM 432-0R		●	●	●	●		1/32	.010	.024	.079	.315
	CNMM 433-0R		●	●	●			3/64	.012	.028	.098	.315
	CNMM 434-0R		●	●	●			1/16	.014	.031	.098	.315
	CNMM 542-0R		●	●	●			1/32	.012	.024	.118	.315
	CNMM 543-0R		●	●		●		3/64	.014	.035	.118	.394
	CNMM 544-0R		●	●				1/16	.014	.039	.118	.394
	CNMM 643-0R		●	●	●	●		3/64	.014	.035	.118	.394
	CNMM 644-0R		●	●	●	●	●	1/16	.015	.047	.118	.394
	CNMM 646-0R		●	●				3/32	.015	.049	.118	.472
	CNMM 866-0R		●	●	●	●	●	3/32	.018	.067	.157	.630

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	T8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CNMM 644-OR1**			●	●			1/16	.012	.039	.118	.433
	**CNMM 866-923**				●	●	●	3/32	.018	.059	.118	.512

DCGT



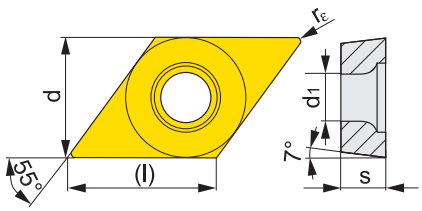
Dimensions	(l)	d	d_1	s		
21.5	.307	1/4	.114	3/32		
32.5	.457	3/8	.177	5/32		

All dimensions [in]

For tools see pages: T38-T39, T49-T52

Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		HF7						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**DCGT 21.50.5F-AL**	●						1/128	.002	.005	.012	.083
	DCGT 21.51F-AL	●						1/64	.004	.009	.016	.083
	DCGT 32.50.5F-AL	●						1/128	.002	.005	.012	.130
	DCGT 32.51F-AL	●						1/64	.004	.009	.016	.130
	DCGT 32.52F-AL	●						1/32	.006	.019	.031	.130

DCMT



Dimensions	(l)	d	d_1	s		
21.5	.307	1/4	.114	3/32		
32.5	.457	3/8	.177	5/32		

All dimensions [in]

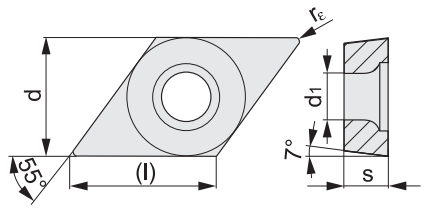
For tools see pages: T38-T39, T49-T52

Chip breaker	Designation	Grades								Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9315	T9325	T8315	T8330	TT310	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	DCMT 32.50.5-FF						●	●		1/128	.002	.005	.008	.079
	DCMT 32.51-FF						●	●		1/64	.002	.009	.016	.079
	DCMT 32.52-FF						●	●		1/32	.002	.009	.031	.079
	DCMT 21.50.5-FM					●	●	●		1/128	.002	.005	.008	.039
	DCMT 21.51-FM			●	●	●	●	●		1/64	.003	.009	.016	.079
	DCMT 32.50.5-FM					●	●	●		1/128	.003	.005	.008	.079
	DCMT 32.51-FM			●	●	●	●	●		1/64	.004	.009	.016	.118
	DCMT 32.52-FM			●	●	●	●	●		1/32	.004	.012	.031	.118
	DCMT 32.53-FM				●	●		●		3/64	.008	.016	.047	.130
	DCMT 32.51-RM	●	●	●	●	●		●		1/64	.006	.009	.039	.130
	DCMT 32.52-RM	●	●	●	●	●		●		1/32	.006	.016	.039	.130
	DCMT 32.53-RM			●	●	●		●		3/64	.006	.018	.059	.130
	DCMT 21.50.5-UR					●	●	●		1/128	.002	.005	.008	.039
	DCMT 21.51-UR				●	●	●	●	●	1/64	.002	.009	.016	.079
	DCMT 32.50.5-UR					●		●	●	1/128	.002	.005	.008	.079
	DCMT 32.51-UR		●	●	●	●	●	●	●	1/64	.003	.009	.016	.098
	DCMT 32.52-UR		●	●	●	●	●	●	●	1/32	.003	.019	.031	.098
	DCMT 32.53-UR				●	●				3/64	.006	.012	.047	.079

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

DCMW



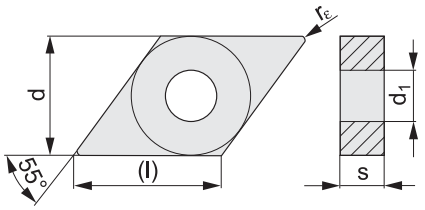
Dimensions	(l)	d	d_1	s		
21.5	.307	1/4	.110	3/32		
32.5	.457	3/8	.173	5/32		

All dimensions [in]

For tools see pages: T38-T39, T49-T52

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	DCMW 21.50.5	●														1/128	.002	.004	.008	.079
	DCMW 21.51	●														1/64	.004	.008	.016	.079
	DCMW 32.51	●														1/64	.004	.009	.016	.114
	DCMW 32.52	●														1/32	.004	.014	.031	.114

DNMA



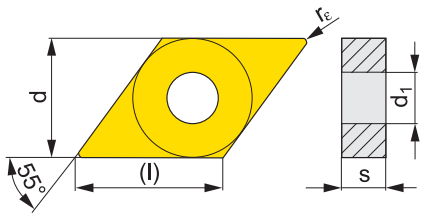
Dimensions	(l)	d	d_1	s		
43	.610	1/2	.203	3/16		
44	.610	1/2	.203	1/4		

All dimensions [in]

For tools see pages: T19-T20, T32

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	DNMA 431	●														1/64	.004	.009	.016	.154
	DNMA 432	●														1/32	.004	.019	.031	.154
	DNMA 441	●														1/64	.004	.009	.016	.154
	DNMA 442	●														1/32	.004	.019	.031	.154
	DNMA 443	●														3/64	.004	.028	.047	.154

DNMG



Dimensions	(l)	d	d_1	s		
33	.457	3/8	.150	3/16		
43	.610	1/2	.203	3/16		
44	.610	1/2	.203	1/4		

All dimensions [in]

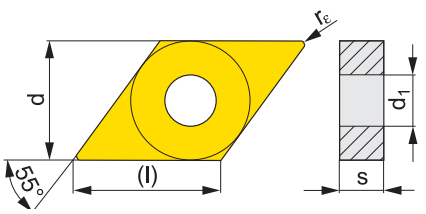
For tools see pages: T19-T20, T32

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310					r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**DNMG 330.5-FF**								●							1/128	.002	.005	.008	.059
	DNMG 331-FF								●							1/64	.002	.008	.016	.059
	DNMG 332-FF								●							1/32	.003	.010	.031	.059
	DNMG 431-FF								●							1/64	.002	.008	.016	.059
	DNMG 441-FF								●							1/64	.002	.008	.016	.059
	DNMG 442-FF								●							1/32	.003	.010	.031	.059
	**DNMG 331-FM**				●	●	●		●	●						1/64	.004	.009	.016	.118
	DNMG 332-FM				●	●	●		●	●						1/32	.004	.014	.031	.118
	DNMG 431-FM					●	●			●						1/64	.004	.009	.020	.118
	DNMG 432-FM					●	●			●						1/32	.006	.018	.031	.118
	DNMG 441-FM			●	●	●	●		●	●	●					1/64	.004	.009	.020	.118
	DNMG 442-FM			●	●	●	●		●	●	●					1/32	.006	.018	.031	.118
	DNMG 443-FM					●	●			●						3/64	.006	.018	.047	.118
	**DNMG 331-M**		●			●	●	●								1/64	.005	.009	.031	.118
	DNMG 332-M		●			●	●	●								1/32	.006	.019	.031	.118
	DNMG 333-M					●	●	●								3/64	.007	.028	.047	.130
	DNMG 431-M					●	●	●								1/64	.007	.009	.031	.118
	DNMG 432-M					●	●	●								1/32	.006	.019	.031	.177
	DNMG 433-M						●	●								3/64	.007	.028	.047	.177
	DNMG 441-M		●			●	●	●								1/64	.007	.009	.031	.118
	DNMG 442-M		●		●	●	●	●								1/32	.006	.019	.031	.177
	DNMG 443-M		●		●	●	●	●								3/64	.007	.028	.047	.177
	**DNMG 331-NM**			●			●			●						1/64	.006	.009	.020	.118
	DNMG 332-NM			●			●			●						1/32	.008	.016	.031	.118
	DNMG 441-NM			●			●			●						1/64	.006	.009	.020	.118
	DNMG 442-NM			●			●			●						1/32	.008	.016	.031	.118
	DNMG 443-NM			●			●									3/64	.008	.016	.047	.138

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**DNMG 442-R**	●					●										1/32	.010	.019	.079	.177
	DNMG 443-R	●				●	●										3/64	.010	.028	.079	.177
	**DNMG 332-RM**					●	●	●									1/32	.008	.019	.039	.130
	DNMG 333-RM					●	●	●									3/64	.010	.024	.059	.130
	DNMG 433-RM					●	●	●									3/64	.010	.028	.059	.177
	DNMG 442-RM	●	●		●	●	●	●	●	●							1/32	.008	.019	.039	.177
	DNMG 443-RM	●	●		●	●	●	●		●							3/64	.010	.028	.059	.177
	DNMG 444-RM		●			●	●	●									1/16	.012	.030	.079	.177
	**DNMG 331R-SI**			●			●			●							1/64	.008	.009	.031	.130
	DNMG 332R-SI			●			●			●							1/32	.008	.019	.031	.130
	DNMG 432R-SI			●			●			●							1/32	.008	.019	.031	.177
	DNMG 441R-SI			●			●			●							1/64	.008	.009	.031	.177
	DNMG 442R-SI			●			●			●							1/32	.008	.019	.031	.177
	**DNMG 331L-SI**			●			●			●							1/64	.008	.009	.031	.130
	DNMG 332L-SI			●			●			●							1/32	.008	.019	.031	.130
	DNMG 432L-SI			●			●			●							1/32	.008	.019	.031	.177
	DNMG 441L-SI			●			●			●							1/64	.008	.009	.031	.177
	DNMG 442L-SI			●			●			●							1/32	.008	.019	.031	.177

DNMM



Dimensions	(l)	d	d_1	s		
43	.610	1/2	.203	3/16		
44	.610	1/2	.203	1/4		

All dimensions [in]

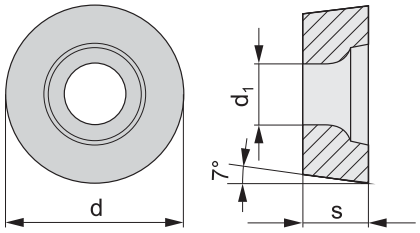
For tools see pages: T19-T20, T32

Chip breaker	Designation	Grades					Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	DNMM 432-NR	●		●			1/32	.010	.019	.039	.177
	DNMM 442-NR	●		●		●	1/32	.010	.019	.039	.177
	DNMM 442-NR2	●		●			1/32	.011	.019	.031	.177
	DNMM 442-OR			●	●		1/32	.010	.019	.079	.177
	DNMM 443-OR		●	●	●		3/64	.012	.028	.079	.177
	DNMM 444-OR			●	●		1/16	.014	.031	.079	.177

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

RCGT



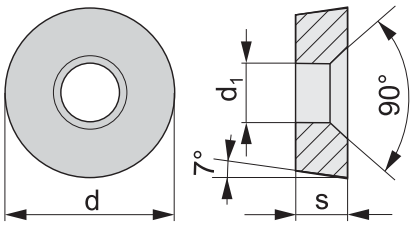
Dimensions	d	d_1	s
0803	.315	.134	1/8
1003	.394	.173	1/8

All dimensions [in]

For tools see pages: T40-T41

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		HF7															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RCGT 0803M0F-AL**	●																.008	.059	.031	.118
	RCGT 1003M0F-AL	●																.008	.079	.039	.157

RCMH



Dimensions	d	d_1	s
3209	1.260	.413	3/8

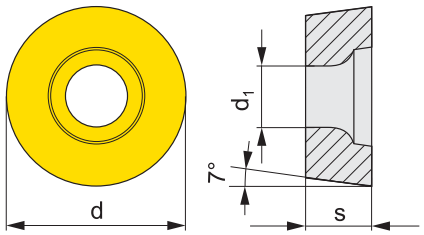
All dimensions [in]

For tools see pages: T40-T41

Chip breaker	ISO	Grades															Radius	Feed/rev.		Depth of cut	
		T9310	T9315	T9325													r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RCMH 3209M0-RM2**	●	●	●														.031	.051	.079	.315
	**RCMH 3209M0-RR2**	●	●	●														.031	.059	.098	.315

● stocked as standard / ○ not stocked as standard
See price list for current availability.

RCMT



Dimensions	d	d_1	s
0602	.236	.110	3/32
0803	.315	.134	1/8
10T3	.394	.173	5/32
1204	.472	.173	3/16
1606	.630	.217	1/4
2006	.787	.256	1/4
2507	.984	.339	5/16

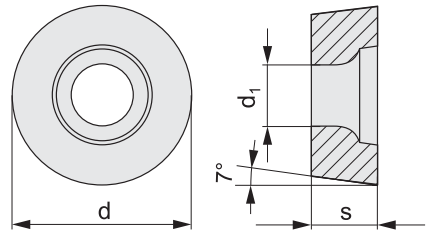
All dimensions [in]

For tools see pages: T40-T41

Chip breaker	Designation	Grades			Radius	Feed/rev.		Depth of cut	
		T9315	T9325	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RCMT 1606M0S-37**	●	●			.008	.035	.039	.157
	**RCMT 2006M0S-371**		●			.008	.047	.039	.197
	**RCMT 2507M0S-372**		●			.008	.047	.039	.236
	**RCMT 0602M0E-FM**	●	●	●		.004	.024	.012	.094
	RCMT 0803M0E-FM	●	●	●		.006	.031	.020	.118
	RCMT 10T3M0E-FM	●	●	●		.012	.039	.028	.157
	RCMT 1204M0E-FM	●	●	●		.012	.039	.028	.189
	**RCMT 0602M0E-UR**		●	●		.004	.016	.009	.059
	RCMT 0803M0E-UR	●	●	●		.005	.020	.013	.118
	RCMT 10T3M0E-UR	●	●	●		.006	.024	.016	.157
	RCMT 1204M0E-UR		●	●		.007	.039	.019	.189

● stocked as standard /○ not stocked as standard
See price list for current availability.

RCMW



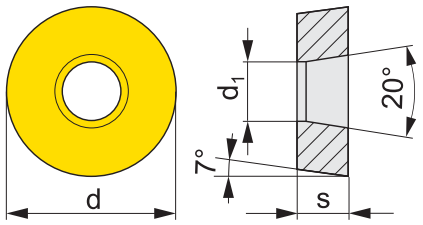
Dimensions	d	d_1	s			
0602	.236	.110	3/32			
0803	.315	.134	1/8			
10T3	.394	.173	5/32			
1204	.472	.173	3/16			

All dimensions [in]

For tools see pages: T40-T41

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305																			
																	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RCMW 0602M0**	●																.004	.008	.020	.059
	RCMW 0803M0	●																.004	.012	.020	.079
	RCMW 10T3M0	●																.004	.014	.020	.098
	RCMW 1204M0	●																.004	.016	.020	.118

RCMX



Dimensions	d	d_1	s
1003	.394	.142	1/8
1204	.472	.165	3/16
1606	.630	.205	1/4
2006	.787	.256	1/4
2507	.984	.283	5/16
3209	1.260	.374	3/8

All dimensions [in]

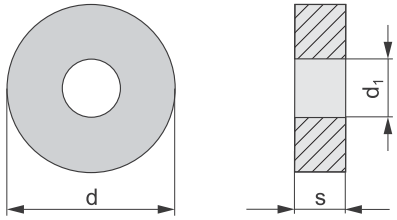
For tools see pages: T35-T36, T40-T41

Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		T5305	T9310	T9315	T9325	T9335	T8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RCMX 1003M0S-31				●	●			.016	.039	.059	.098
	RCMX 1204M0S-321				●	●			.016	.039	.039	.118
	RCMX 1606M0S-331			●	●	●			.016	.047	.039	.157
	RCMX 1606M0S-37			●	●				.008	.035	.039	.157
	RCMX 2006M0-RF1	●	●	●	●	●			.018	.047	.039	.197
	RCMX 2507M0-RF1		●	●	●	●	●		.024	.047	.059	.276
	RCMX 2006M0-RM1		●	●	●	●			.008	.051	.059	.197
	RCMX 2507M0-RM1		●	●	●	●			.024	.047	.079	.276
	RCMX 2507M0-RM2		●	●	●				.031	.059	.079	.276
	RCMX 3209M0-RM2		●	●	●	●			.031	.059	.079	.315
	RCMX 3209M0-RR2		●	●	●				.031	.059	.098	.315

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

RNMG



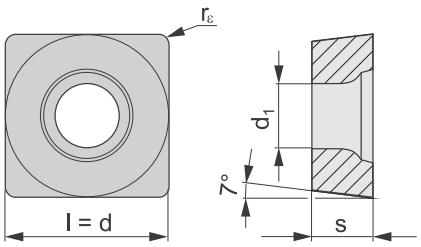
Dimensions	d	d_1	s			
43	.500	.203	3/16			
54	.625	.250	1/4			
64	.750	.250	1/4			

All dimensions [in]

For tools see pages: T21

Chip breaker	Designation	Grades			Radius	Feed/rev.		Depth of cut	
		T5305	T9315	T9325	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RNMG 43-08	●	●	●	0	.012	.031	.039	.189
	RNMG 54-08	●	●	●	0	.012	.031	.039	.236
	RNMG 64-08		●	●	0	.012	.031	.039	.236

SCGT



Dimensions	l	d	d_1	s		
43	.500	1/2	.217	3/16		

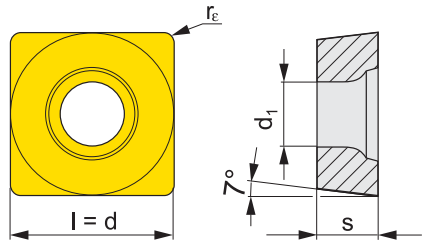
All dimensions [in]

For tools see pages: T42

Chip breaker	Designation	Grades	Radius	Feed/rev.		Depth of cut	
		HF7	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SCGT 432F-AL	●	1/32	.006	.024	.031	.276

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SCMT



Dimensions	l	d	d_1	s		
32.5	.375	3/8	.177	5/32		
43	.500	1/2	.220	3/16		

All dimensions [in]

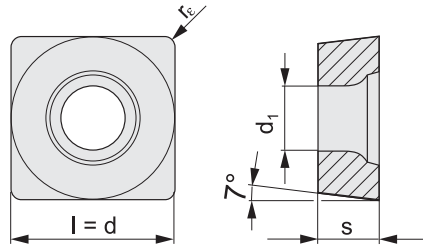
For tools see pages: T42

Chip breaker	Designation	Grades								Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9315	T9325	T8315	T8330	TT310	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SCMT 32.51-FM			●	●	●	●	●		1/64	.004	.012	.016	.118
	SCMT 32.52-FM			●	●	●	●	●		1/32	.006	.014	.031	.118
	**SCMT 431-FM**				●	●	●	●		1/64	.004	.012	.016	.157
	SCMT 432-FM			●	●	●	●	●		1/32	.006	.014	.031	.157
	SCMT 433-FM				●	●		●		3/64	.006	.018	.047	.157
	**SCMT 32.52-RM**	●	●	●	●	●		●		1/32	.008	.016	.059	.157
	SCMT 432-RM	●	●	●	●	●		●		1/32	.008	.016	.059	.177
	**SCMT 32.51-UR**				●	●		●		1/64	.003	.012	.016	.118
	SCMT 32.52-UR		●		●	●		●	●	1/32	.003	.020	.031	.118
	SCMT 432-UR		●		●	●		●		1/32	.003	.020	.031	.157
	SCMT 433-UR					●		●		3/64	.003	.020	.047	.157

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

SCMW



Dimensions	l	d	d_1	s		
32.5	.375	3/8	.173	5/32		
43	.500	1/2	.217	3/16		

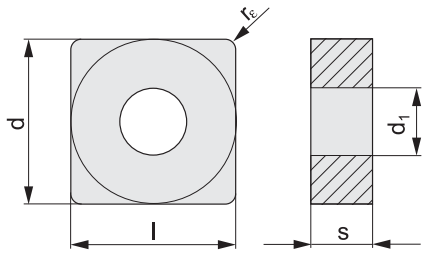
All dimensions [in]

For tools see pages: T42

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SCMW 32.51	●															1/64	.004	.013	.016	.177
	SCMW 32.52	●															1/32	.004	.014	.031	.177
	SCMW 432	●															1/32	.004	.016	.031	.236

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SNMA



Dimensions	(l)	d	d_1	s		
43	.500	1/2	.203	3/16		
54	.625	5/8	.250	1/4		
64	.750	3/4	.313	1/4		
85	1,000	1	.359	5/16		

All dimensions [in]

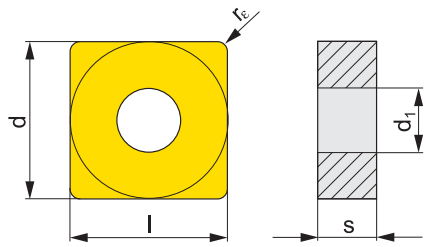
For tools see pages: T22-T25

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315													r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNMA 432	●	●													1/32	.004	.024	.031	.236
	SNMA 433	●	●													3/64	.004	.024	.047	.236
○	**SNMA 543**	●														3/64	.004	.035	.047	.280
	SNMA 643	●														3/64	.004	.035	.047	.350
	SNMA 644	●														1/16	.004	.035	.063	.350
	SNMA 856	●														3/32	.004	.043	.094	.472
	SNMA 433S	●														3/64	.004	.024	.047	.236
○	**SNMA 644S**	●														1/16	.004	.035	.047	.350
	SNMA 856S	●														3/32	.004	.043	.094	.472

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

SNMG



Dimensions	l	d	d_1	s		
43	.500	1/2	.203	3/16		
54	.625	5/8	.250	1/4		
64	.750	3/4	.313	1/4		

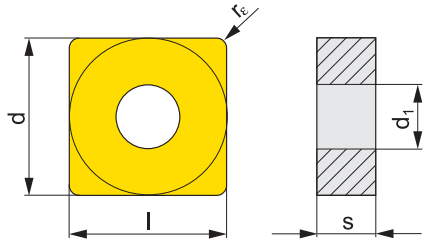
All dimensions [in]

For tools see pages: T22-T25

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNMG 431-FM					●	●		●	●							1/64	.004	.012	.020	.118
	SNMG 432-FM				●	●	●		●	●	●						1/32	.006	.018	.031	.118
	SNMG 433-FM					●	●			●							3/64	.006	.018	.047	.118
	SNMG 434-FM					●	●			●							1/16	.006	.018	.063	.331
	SNMG 432-KR	●	●														1/32	.008	.020	.031	.276
	SNMG 433-KR	●	●														3/64	.010	.028	.047	.276
	SNMG 432-M	●	●		●	●	●	●									1/32	.006	.024	.031	.236
	SNMG 433-M					●	●	●									3/64	.007	.031	.047	.236
	SNMG 434-M					●	●	●									1/16	.007	.031	.063	.236
	SNMG 543-M					●	●	●									3/64	.007	.031	.047	.315
	SNMG 643-M					●	●	●									3/64	.007	.031	.047	.315
	SNMG 644-M					●	●	●									1/16	.007	.031	.063	.315
	SNMG 432-R	●					●	●									1/32	.010	.024	.079	.236
	SNMG 433-R	●					●	●									3/64	.010	.028	.079	.236
	SNMG 434-R						●										1/16	.012	.031	.079	.236
	SNMG 543-R	●					●										3/64	.010	.028	.079	.276
	SNMG 544-R						●										1/16	.010	.028	.079	.276
	SNMG 643-R						●										3/64	.010	.028	.079	.354
	SNMG 644-R						●										1/16	.012	.031	.079	.354
	SNMG 432-RM	●	●		●	●	●	●	●	●							1/32	.008	.020	.039	.276
	SNMG 433-RM	●	●		●	●	●	●									3/64	.010	.028	.059	.276
	SNMG 434-RM	●	●		●	●	●	●		●							1/16	.012	.030	.079	.276
	SNMG 543-RM	●	●		●	●	●	●									3/64	.010	.028	.059	.315
	SNMG 544-RM	●	●			●	●	●									1/16	.012	.031	.079	.315
	SNMG 643-RM	●	●		●	●	●	●									3/64	.010	.028	.059	.394
	SNMG 644-RM	●	●		●	●	●	●									1/16	.012	.031	.079	.394
	SNMG 432-NM			●			●			●							1/32	.008	.020	.031	.118
	SNMG 433-NM			●			●										3/64	.008	.020	.047	.138

● stocked as standard / ○ not stocked as standard
See price list for current availability.

SNMM



Dimensions	l	d	d_1	s		
43	.500	1/2	.203	3/16		
54	.625	5/8	.250	1/4		
64	.750	3/4	.313	1/4		
85	1,000	1	.359	5/16		

All dimensions [in]

For tools see pages: T22-T25

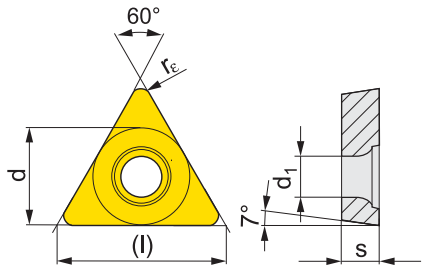
Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	T8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SNMM 433-DR**			●	●			3/64	.012	.033	.098	.331
	SNMM 543-DR			●	●			3/64	.012	.033	.098	.354
	SNMM 643-DR			●	●			3/64	.012	.033	.098	.354
	SNMM 644-DR			●	●			1/16	.012	.033	.098	.354
	**SNMM 644-HR**			●	●		●	1/16	.020	.054	.197	.524
	SNMM 646-HR			●	●		●	3/32	.020	.055	.197	.524
	SNMM 854-HR			●	●		●	1/16	.020	.054	.197	.551
	SNMM 856-HR			●	●		●	3/32	.020	.055	.197	.551
	SNMM 858-HR			●	●			1/8	.024	.055	.197	.551
	**SNMM 432-NR**	●		●		●		1/32	.010	.027	.039	.331
	**SNMM 432-NR2**	●		●		●		1/32	.012	.022	.031	.276
	SNMM 433-NR2	●		●		●		3/64	.013	.028	.047	.295
	SNMM 543-NR2	●		●		●		3/64	.012	.028	.047	.354
	SNMM 544-NR2	●		●				1/16	.014	.035	.063	.354
	SNMM 643-NR2	●		●				3/64	.013	.028	.059	.472
	SNMM 644-NR2	●		●		●		1/16	.014	.035	.063	.472
	SNMM 646-NR2	●		●				3/32	.016	.047	.098	.472
	SNMM 856-NR2	●		●		●		3/32	.020	.055	.118	.630
	**SNMM 432-0R**		●	●	●			1/32	.012	.027	.059	.236
	SNMM 433-0R		●	●				3/64	.013	.028	.079	.236
	SNMM 434-0R		●	●				1/16	.014	.031	.079	.315
	SNMM 542-0R		●	●	●			1/32	.014	.024	.079	.315
	SNMM 543-0R		●	●	●			3/64	.014	.039	.079	.354
	SNMM 544-0R		●	●				1/16	.016	.039	.079	.394
	SNMM 643-0R		●	●	●	●		3/64	.014	.039	.118	.394
	SNMM 644-0R		●	●	●	●	●	1/16	.015	.047	.079	.394
	SNMM 646-0R		●	●				3/32	.018	.047	.138	.472
	SNMM 854-0R		●	●	●			1/16	.018	.054	.157	.630

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades						Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	T8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SNMM 856-0R**		●	●	●	●	●	3/32	.018	.067	.157	.630
	**SNMM 644-0R1**			●	●			1/16	.012	.039	.118	.433
	**SNMM 856-SR**			●	●			3/32	.028	.063	.197	.630
	**SNMM 644-923**				●	●	●	1/16	.018	.054	.118	.512
	SNMM 854-923				●			1/16	.018	.054	.118	.512
	SNMM 856-923				●	●	●	3/32	.018	.059	.118	.512

● stocked as standard / ○ not stocked as standard
See price list for current availability.

TCGT



Dimensions	(l)	d	d_1	s		
21.5	.433	1/4	.110	3/32		
32.5	.650	3/8	.173	5/32		

All dimensions [in]

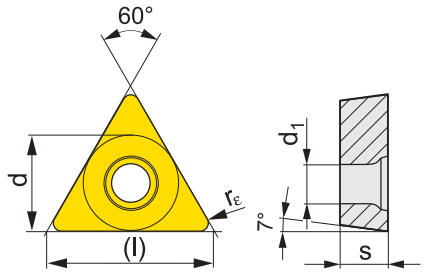
For tools see pages: T43, T53

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T8330	HF7														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TCGT 21.50.5F-AL**		●														1/128	.002	.005	.012	.143
	TCGT 21.51F-AL		●														1/64	.004	.009	.016	.143
	TCGT 21.52F-AL		●														1/32	.006	.019	.031	.143
	TCGT 32.51F-AL		●														1/64	.004	.009	.016	.208
	TCGT 32.52F-AL		●														1/32	.006	.019	.031	.208
	**TCGT 21.50.5R-SI**	●															1/128	.003	.005	.016	.063
	TCGT 21.51R-SI	●															1/64	.003	.009	.016	.063
	**TCGT 21.50.5L-SI**	●															1/128	.003	.005	.016	.063
	TCGT 21.51L-SI	●															1/64	.003	.009	.016	.063

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

TCMT



Dimensions	(l)	d	d_1	s		
21.5	.433	1/4	.114	3/32		
32.5	.650	3/8	.177	5/32		

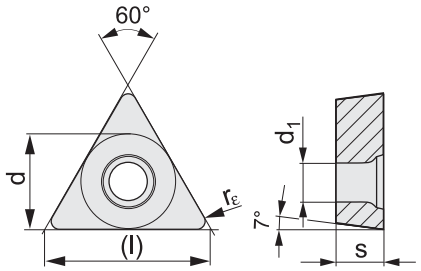
All dimensions [in]

For tools see pages: T43, T53

Chip breaker	Designation	Grades								Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9315	T9325	T8315	T8330	TT310	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TCMT 21.50.5-FM**			●		●	●	●		1/128	.003	.005	.008	.079
	TCMT 21.51-FM			●	●	●	●	●		1/64	.003	.009	.016	.079
	TCMT 21.52-FM					●		●		1/32	.006	.012	.031	.098
	TCMT 32.51-FM			●	●	●	●	●		1/64	.004	.009	.016	.118
	TCMT 32.52-FM			●	●	●	●	●		1/32	.004	.010	.031	.118
	**TCMT 32.52-RM**	●	●	●	●	●		●		1/32	.006	.016	.039	.157
	TCMT 32.53-RM	●	●		●	●		●		3/64	.006	.018	.059	.157
	**TCMT 21.51-UR**				●	●		●		1/64	.003	.009	.016	.079
	TCMT 32.51-UR				●	●		●	●	1/64	.003	.009	.016	.118
	TCMT 32.52-UR		●		●	●		●		1/32	.003	.012	.031	.118

● stocked as standard / ○ not stocked as standard
See price list for current availability.

TCMW



Dimensions	(l)	d	d_1	s		
21.5	.433	1/4	.110	3/32		
32.5	.650	3/8	.173	5/32		

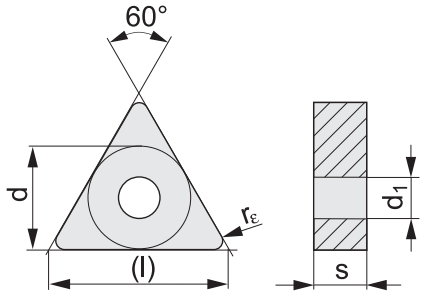
All dimensions [in]

For tools see pages: T43, T53

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TCMW 21.51	●															1/64	.004	.008	.016	.142
	TCMW 32.51	●															1/64	.004	.009	.016	.189
	TCMW 32.52	●															1/32	.004	.014	.031	.189

● stocked as standard /○ not stocked as standard
See price list for current availability.

TNMA



Dimensions	(l)	d	d_1	s		
33	.650	3/8	.150	3/16		
43	.866	1/2	.203	3/16		

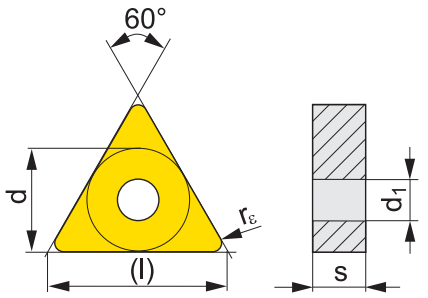
All dimensions [in]

For tools see pages: T26-T28, T33

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TNMA 331	●															1/64	.004	.009	.016	.189
	TNMA 332	●	●														1/32	.004	.016	.031	.189
	TNMA 333	●															3/64	.004	.016	.047	.189
	TNMA 432	●															1/32	.004	.016	.031	.252
	TNMA 433	●															3/64	.004	.016	.047	.252
	TNMA 332S	●															1/32	.004	.016	.031	.189
	TNMA 433S	●															3/64	.004	.016	.047	.252

● stocked as standard / ○ not stocked as standard
See price list for current availability.

TNMG



Dimensions	(l)	d	d_1	s		
33	.650	3/8	.150	3/16		
43	.866	1/2	.203	3/16		
54	1.083	5/8	.250	1/4		

All dimensions [in]

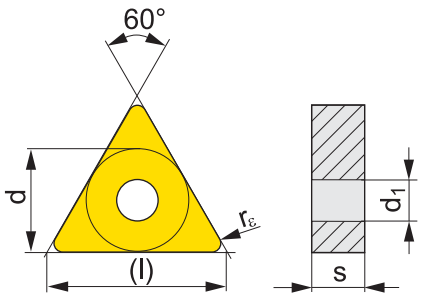
For tools see pages: T26-T28, T33

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310					r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TNMG 331-FF								●							1/64	.002	.008	.016	.059
	TNMG 332-FF								●							1/32	.003	.010	.031	.059
	TNMG 331-FM			●	●	●	●		●	●	●					1/64	.004	.009	.020	.118
	TNMG 332-FM			●	●	●	●		●	●	●					1/32	.006	.018	.031	.118
	TNMG 333-FM					●	●			●						3/64	.006	.018	.047	.118
	TNMG 332-KR	●	●													1/32	.008	.016	.031	.156
	TNMG 331-M		●			●	●	●								1/64	.007	.009	.031	.118
	TNMG 332-M	●	●		●	●	●	●								1/32	.006	.019	.031	.197
	TNMG 333-M		●			●	●	●								3/64	.007	.028	.047	.208
	TNMG 432-M	●	●		●	●	●	●								1/32	.007	.019	.039	.236
	TNMG 433-M	●	●			●	●	●								3/64	.007	.028	.047	.236
	TNMG 332-R					●	●	●								1/32	.010	.019	.079	.197
	TNMG 333-R						●	●								3/64	.010	.028	.079	.197
	TNMG 432-R						●									1/32	.010	.019	.079	.236
	TNMG 433-R						●									3/64	.010	.028	.079	.236
	TNMG 434-R						●									1/16	.010	.031	.079	.236
	TNMG 332-RM	●	●		●	●	●	●								1/32	.008	.019	.039	.208
	TNMG 333-RM	●	●			●	●	●		●						3/64	.010	.026	.059	.208
	TNMG 432-RM	●	●		●	●	●	●								1/32	.008	.019	.039	.276
	TNMG 433-RM	●	●		●	●	●	●								3/64	.010	.026	.059	.276
	TNMG 434-RM	●	●			●	●	●								1/16	.012	.030	.079	.276
	TNMG 544-RM					●	●	●								1/16	.014	.030	.079	.351
	TNMG 546-RM						●	●								3/32	.014	.031	.118	.351
	TNMG 331-NM			●			●			●						1/64	.006	.009	.020	.118
	TNMG 332-NM			●			●			●						1/32	.008	.016	.039	.118
	TNMG 432-NM			●			●			●						1/32	.008	.016	.039	.138

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TNMG 433-NM**			●			●										3/64	.008	.016	.047	.138
	**TNMG 331R-SI**			●			●			●							1/64	.008	.009	.031	.197
	TNMG 332R-SI			●			●			●							1/32	.008	.019	.031	.197
	**TNMG 331L-SI**			●			●			●							1/64	.008	.009	.031	.197
	TNMG 332L-SI			●			●			●							1/32	.008	.019	.031	.197

TNMM



Dimensions	(l)	d	d_1	s		
33	.650	3/8	.150	3/16		
43	.866	1/2	.203	3/16		
54	1.083	5/8	.250	1/4		

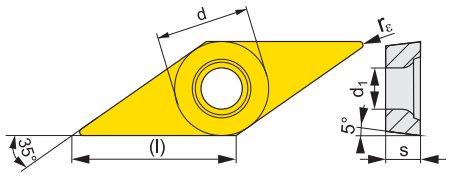
All dimensions [in]

For tools see pages: T26-T28, T33

Chip breaker	Designation	Grades				Radius	Feed/rev.		Depth of cut	
		T9315	T9325	T9335	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TNMM 332-DR		●			1/32	.012	.019	.098	.208
	TNMM 432-DR		●	●		1/32	.012	.019	.098	.286
	TNMM 433-DR		●	●		3/64	.012	.028	.098	.286
	TNMM 434-DR		●			1/16	.012	.033	.098	.286
	TNMM 544-DR		●	●		1/16	.012	.033	.098	.351
	TNMM 544-HR		●	●		1/16	.020	.038	.197	.351
	TNMM 546-HR		●			3/32	.020	.055	.197	.351
	TNMM 332-NR2		●			1/32	.008	.019	.031	.208
	TNMM 432-NR2		●			1/32	.010	.019	.031	.286
	TNMM 433-NR2		●		●	3/64	.012	.028	.047	.286
	TNMM 332-OR	●	●			1/32	.010	.018	.079	.197
	TNMM 333-OR	●	●			3/64	.012	.024	.079	.208
	TNMM 432-OR	●	●	●		1/32	.012	.019	.079	.236
	TNMM 433-OR	●	●	●		3/64	.013	.028	.079	.276
	TNMM 434-OR	●	●			1/16	.016	.031	.118	.286
	TNMM 433R			●		3/64	.008	.020	.047	.197
	TNMM 433L			●		3/64	.008	.020	.047	.197

● stocked as standard /○ not stocked as standard
See price list for current availability.

VBMT



Dimensions	(l)	d	d_1	s		
22	.437	1/4	.114	1/8		
33	.654	3/8	.177	3/16		

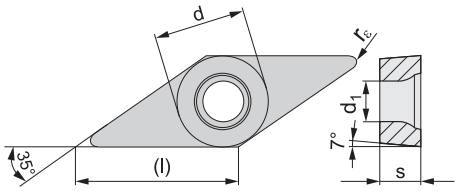
All dimensions [in]

For tools see pages: T44-T46, T54-T55

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VBMT 220.5-FM**						●	●	●							1/128	.003	.004	.008	.079
	VBMT 221-FM			●		●	●	●	●							1/64	.003	.008	.016	.079
	VBMT 222-FM					●	●		●							1/32	.004	.010	.031	.098
	VBMT 330.5-FM						●		●							1/128	.003	.004	.008	.079
	VBMT 331-FM		●	●		●	●	●	●							1/64	.004	.008	.016	.079
	VBMT 332-FM		●	●		●	●	●	●							1/32	.006	.012	.031	.098
	VBMT 333-FM					●	●		●							3/64	.008	.016	.047	.118
	**VBMT 331-RM**	●	●	●		●	●		●							1/64	.004	.008	.031	.142
	VBMT 332-RM	●	●	●		●	●		●							1/32	.004	.014	.039	.142
	VBMT 333-RM			●		●	●		●							3/64	.006	.016	.047	.142
	**VBMT 330.5-UR**								●							1/128	.002	.004	.008	.079
	VBMT 331-UR		●		●	●	●		●	●						1/64	.003	.008	.016	.079
	VBMT 332-UR		●		●	●	●		●	●						1/32	.003	.012	.031	.118
	VBMT 333-UR				●	●	●		●							3/64	.003	.012	.047	.118

● stocked as standard / ○ not stocked as standard
See price list for current availability.

VCGT



Dimensions	(l)	d	d_1	s		
22	.437	1/4	.110	1/8		
33	.654	3/8	.173	3/16		

All dimensions [in]

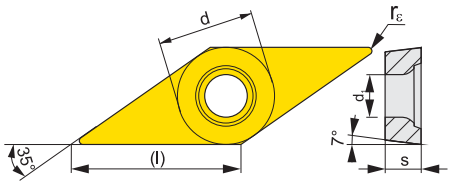
For tools see pages: T44-T46, T54-T55

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		HF7															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VCGT 220.5F-AL**	●															1/128	.002	.004	.012	.108
	VCGT 221F-AL	●															1/64	.004	.008	.016	.108
	VCGT 330.5F-AL	●															1/128	.002	.004	.012	.157
	VCGT 331F-AL	●															1/64	.004	.008	.016	.157
	VCGT 332F-AL	●															1/32	.006	.016	.031	.157
	VCGT 333F-AL	●															3/64	.006	.024	.047	.157

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

VCMT



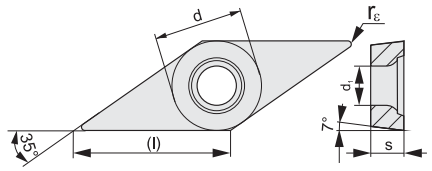
Dimensions	(l)	d	d_1	s		
32.5	.256	3/8	.177	5/32		
43	.343	1/2	.220	3/16		

All dimensions [in]

For tools see pages: T44-T46, T54-T55

Chip breaker	Designation	Grades		Radius	Feed/rev.		Depth of cut	
		T9325	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VCMT 331-FM**	●	●	1/64	.004	.008	.016	.079
	VCMT 332-FM	●	●	1/32	.006	.012	.031	.098
	**VCMT 221-UR**	●	●	1/64	.003	.008	.016	.079
	VCMT 222-UR	●	●	1/32	.003	.012	.031	.079
	VCMT 331-UR	●	●	1/64	.003	.008	.016	.079
	VCMT 332-UR	●	●	1/32	.003	.012	.031	.118

VCMW



Dimensions	(l)	d	d_1	s		
22	.437	1/4	.110	1/8		
33	.650	3/8	.173	3/16		

All dimensions [in]

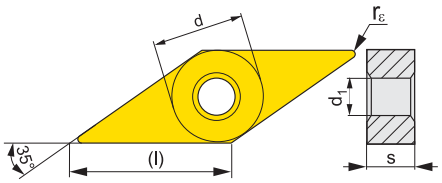
For tools see pages: T44-T46, T54-T55

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VCMW 220.5**	●															1/128	.003	.004	.008	.094
	VCMW 221	●															1/64	.004	.008	.016	.094
	VCMW 331	●															1/64	.004	.008	.016	.146
	VCMW 332	●															1/32	.004	.016	.031	.146

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

VNMG



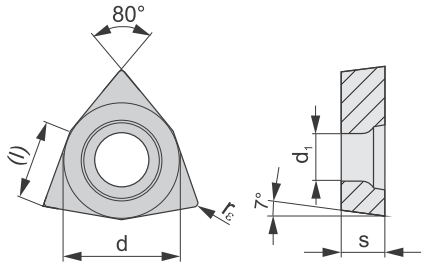
Dimensions	(l)	d	d_1	s		
33	.375	3/8	.150	3/16		

All dimensions [in]

For tools see pages: T29

Chip breaker	Designation	Grades								Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VNMG 331-FF**								●		1/64	.002	.008	.016	.059
	**VNMG 331-FM**				●	●	●			●	1/64	.004	.008	.020	.118
	VNMG 332-FM				●	●	●			●	1/32	.006	.014	.031	.118
	VNMG 333-FM					●	●			●	3/64	.006	.018	.047	.118
	**VNMG 331-M**		●			●	●	●			1/64	.005	.008	.031	.118
	VNMG 332-M	●	●		●	●	●	●			1/32	.006	.016	.031	.118
	VNMG 333-M						●	●			3/64	.007	.024	.047	.157
	**VNMG 331-NM**			●			●			●	1/64	.006	.008	.020	.118
	VNMG 332-NM			●			●			●	1/32	.008	.016	.031	.118

WCGT



Dimensions	(l)	d	d_1	s		
32.5	.256	3/8	.173	5/32		
43	.343	1/2	.217	3/16		

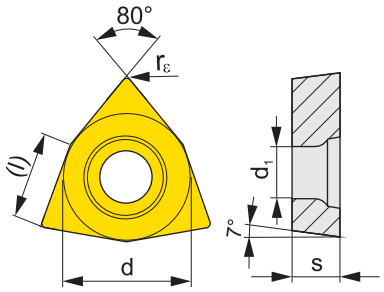
All dimensions [in]

For tools see pages: T47, T56

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		HF7															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WCGT 32.50.5F-AL**	●															1/128	.002	.006	.012	.118
	WCGT 32.51F-AL	●															1/64	.003	.012	.016	.138
	WCGT 32.52F-AL	●															1/32	.003	.024	.031	.165
	WCGT 433F-AL	●															3/64	.006	.024	.047	.220

● stocked as standard /○ not stocked as standard
See price list for current availability.

WCMT



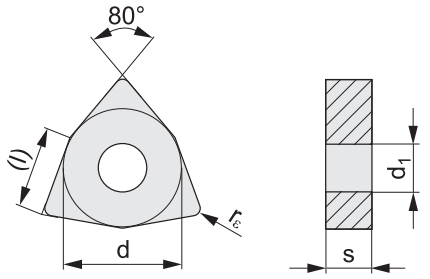
Dimensions	(l)	d	d_1	s		
32.5	.256	3/8	.177	5/32		
43	.343	1/2	.220	3/16		

All dimensions [in]

For tools see pages: T47, T56

Chip breaker	Designation	Grades					Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T8315	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WCMT 32.51-FM**	●	●	●	●	●	1/64	.004	.012	.016	.118
	WCMT 32.52-FM	●	●	●	●	●	1/32	.006	.014	.031	.118
	WCMT 431-FM	●	●	●	●	●	1/64	.004	.012	.016	.157
	WCMT 432-FM	●	●	●	●	●	1/32	.006	.014	.031	.157
	WCMT 433-FM		●	●		●	3/64	.006	.018	.047	.157
	**WCMT 32.52-UR**		●	●			1/32	.006	.012	.031	.118

WNMA



Dimensions	(l)	d	d_1	s		
43	.342	1/2	.203	3/16		

All dimensions [in]

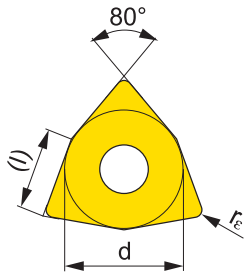
For tools see pages: T30, T34

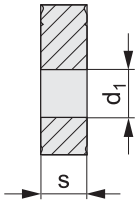
Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WNMA 431**	●															1/64	.004	.012	.016	.173
	WNMA 432	●	●														1/32	.004	.024	.031	.173
	WNMA 433	●	●														3/64	.004	.024	.047	.173
	**WNMA 432S**	●															1/32	.004	.024	.031	.173

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

WNMG





Dimensions	(l)	d	d_1	s		
33	.256	3/8	.150	3/16		
43	.343	1/2	.203	3/16		

All dimensions [in]

For tools see pages: T30, T34

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310					r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WNMG 330.5-FF**								●							1/128	.002	.006	.008	.059
	WNMG 331-FF								●							1/64	.002	.008	.016	.059
	WNMG 431-FF								●							1/64	.002	.008	.016	.059
	WNMG 432-FF								●							1/32	.003	.010	.031	.059
	**WNMG 331-FM**					●	●		●	●	●					1/64	.004	.012	.020	.118
	WNMG 332-FM					●	●			●	●					1/32	.004	.014	.031	.118
	WNMG 333-FM					●										3/64	.006	.018	.047	.118
	WNMG 431-FM			●	●	●	●		●	●						1/64	.004	.012	.020	.118
	WNMG 432-FM			●	●	●	●		●	●						1/32	.006	.018	.031	.118
	WNMG 433-FM			●	●	●	●			●						3/64	.006	.018	.047	.157
	**WNMG 433-KR**	●	●													3/64	.010	.024	.047	.217
	**WNMG 331-M**		●			●	●	●								1/64	.007	.012	.031	.118
	WNMG 332-M		●		●	●	●	●								1/32	.006	.024	.031	.157
	WNMG 431-M		●			●	●	●								1/64	.007	.012	.031	.118
	WNMG 432-M	●	●		●	●	●	●		●						1/32	.006	.024	.031	.220
	WNMG 433-M	●	●		●	●	●	●								3/64	.007	.031	.047	.220
	**WNMG 432-R**	●				●	●	●								1/32	.010	.024	.079	.220
	WNMG 433-R	●				●	●									3/64	.010	.028	.079	.220
	**WNMG 333-RM**					●	●	●								3/64	.010	.024	.051	.157
	WNMG 432-RM	●	●		●	●	●	●	●	●						1/32	.008	.022	.039	.197
	WNMG 433-RM	●	●		●	●	●	●	●							3/64	.010	.028	.059	.197
	WNMG 434-RM	●	●		●	●	●	●		●						1/16	.012	.030	.079	.197
	**WNMG 332W-F**					●	●									1/32	.006	.024	.031	.165
	WNMG 431W-F					●	●									1/64	.006	.012	.016	.173

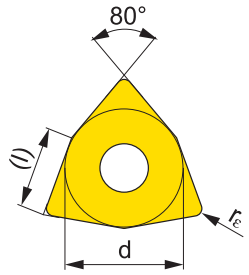
● stocked as standard / ○ not stocked as standard
See price list for current availability.

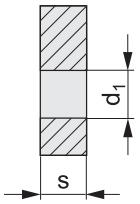
Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8315	T8330	TT310						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WNMG 332W-M**				●	●	●										1/32	.006	.024	.031	.118
	WNMG 333W-M		●			●	●										3/64	.008	.035	.047	.118
	WNMG 432W-M					●	●										1/32	.006	.024	.031	.157
	WNMG 433W-M		●			●	●										3/64	.008	.035	.047	.157
	**WNMG 331-NM**			●			●			●							1/64	.006	.012	.020	.118
	WNMG 332-NM			●			●			●							1/32	.008	.016	.031	.118
	WNMG 333-NM			●			●										3/64	.008	.020	.047	.138
	WNMG 431-NM			●			●			●							1/64	.006	.012	.020	.118
	WNMG 432-NM			●			●			●							1/32	.008	.020	.031	.118
	WNMG 433-NM			●			●										3/64	.008	.020	.047	.138
	**WNMG 331R-SI**						●			●							1/64	.008	.012	.031	.165
	WNMG 431R-SI						●			●							1/64	.008	.012	.031	.197
	WNMG 432R-SI						●			●							1/32	.008	.020	.031	.197
	**WNMG 331L-SI**						●			●							1/64	.008	.012	.031	.165
	WNMG 431L-SI						●			●							1/64	.008	.012	.031	.197
	WNMG 432L-SI						●			●							1/32	.008	.020	.031	.197

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

WNMM





Dimensions	(l)	d	d_1	s		
43	.343	1/2	.203	3/16		

All dimensions [in]

For tools see pages: T30, T34

Chip breaker	Designation	Grades					Radius	Feed/rev.		Depth of cut	
		T7335	T9315	T9325	T9335	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WNMM 432-NR**	●		●		●	1/32	.010	.024	.039	.220
	**WNMM 432-NR2**	●		●			1/32	.010	.024	.039	.197
	WNMM 433-NR2	●		●			3/64	.011	.028	.059	.197
	**WNMM 432-OR**		●	●	●	●	1/32	.010	.024	.079	.197
	WNMM 433-OR		●	●	●		3/64	.013	.028	.079	.220
	WNMM 434-OR			●			1/16	.014	.039	.118	.220

● stocked as standard / ○ not stocked as standard
See price list for current availability.

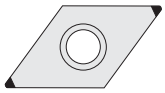
CCGW

T131

CNGA

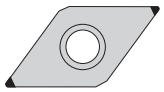
T131

DCGW



T132

DNGA



T132

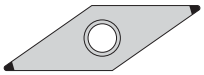
TCGW

T133

TNGA

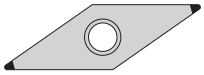
T133

VBGW



T134

VNGA

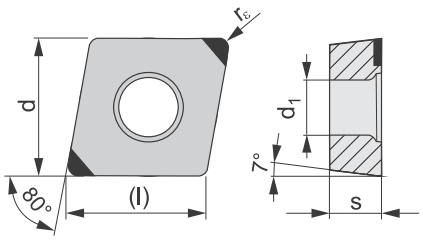


T134

WNGA

T135

CCGW



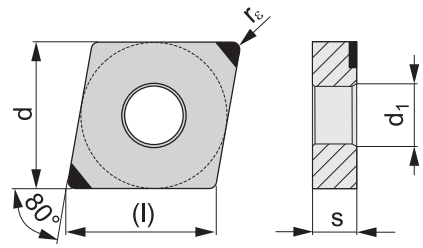
Dimensions	(l)	d	d_1	s		
21.5	.256	1/4	.114	3/32		
32.5	.382	3/8	.177	5/32		

All dimensions [in]

For tools see pages: T37, T48

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		TB310														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CCGW 21.51E	●														1/64	.001	.008	.002	.106
	CCGW 21.51S00420	●														1/64	.001	.008	.002	.106
	CCGW 32.51E	●														1/64	.001	.008	.002	.106
	CCGW 32.51S00420	●														1/64	.001	.008	.002	.106
	CCGW 32.51S00420W	●														1/64	.001	.008	.002	.106

CNGA



Dimensions	(l)	d	d_1	s		
43	.508	1/2	.203	3/16		

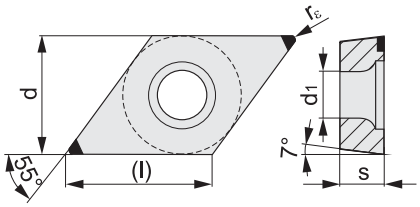
All dimensions [in]

For tools see pages: T17, T31

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		TB310														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CNGA 431S00420	●														1/64	.001	.008	.002	.106
	CNGA 432S00420	●														1/32	.001	.008	.002	.106

● stocked as standard / ○ not stocked as standard
See price list for current availability.

DCGW



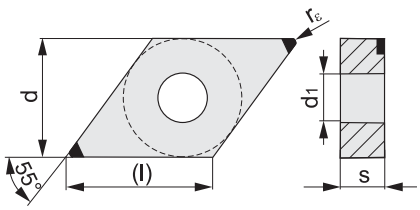
Dimensions	(l)	d	d_1	s		
32.5	.457	3/8	.177	5/32		

All dimensions [in]

For tools see pages: T38-T39, T49 - T52

Chip breaker	Designation	Grades		Radius	Feed/rev.		Depth of cut	
		TB310		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**DCGW 32.51S00420**	●		1/64	.001	.008	.002	.118
	DCGW 32.52S00420	●		1/32	.001	.008	.002	.118

DNGA



Dimensions	(l)	d	d_1	s		
44	.610	1/2	.203	3/16		

All dimensions [in]

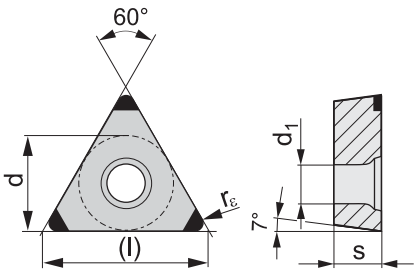
For tools see pages: T19-T20, T32

Chip breaker	Designation	Grades		Radius	Feed/rev.		Depth of cut	
		TB310		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**DNGA 442S00420**	●		1/32	.001	.008	.002	.118

PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

TCGW



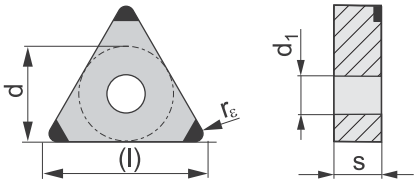
Dimensions	(l)	d	d_1	s		
21.5	.433	1/4	.110	3/32		
32.5	.650	3/8	.173	5/32		

All dimensions [in]

For tools see pages: T43, T53

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		TB310														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TCGW 21.51E	●														1/64	.001	.008	.002	.098
	TCGW 21.51S00420	●														1/64	.001	.008	.002	.098
	TCGW 21.52S00420	●														1/32	.001	.008	.002	.098

TNGA



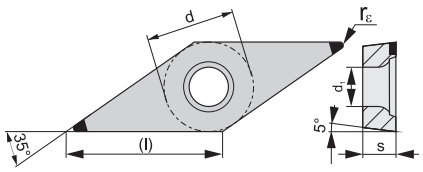
Dimensions	(l)	d	d_1	s		
33	.650	3/8	.150	3/16		

All dimensions [in]

For tools see pages: T26-T28, T33

Chip breaker	Designation	Grades														Radius	Feed/rev.		Depth of cut	
		TB310														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TNGA 332S00420	●														1/32	.001	.008	.002	.098

VBGW



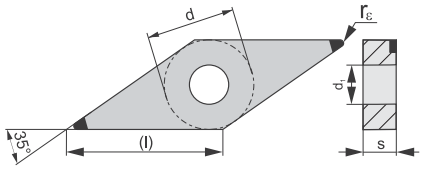
Dimensions	(l)	d	d_1	s		
33	.630	3/8	.177	3/16		

All dimensions [in]

For tools see pages: T44-T46, T54 - T55

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		TB310															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	VBGW 331S00420	●															1/64	.001	.006	.002	.142
	VBGW 332S00420	●															1/32	.001	.008	.002	.142

VNGA



Dimensions	(l)	d	d_1	s		
43	.342	1/2	.203	3/16		

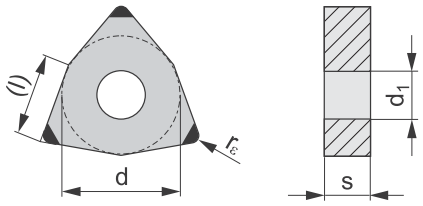
All dimensions [in]

For tools see pages: T29

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		TB310															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	VNGA 331S00420	●															1/64	.001	.006	.002	.142
	VNGA 332S00420	●															1/32	.001	.008	.002	.142

● stocked as standard /○ not stocked as standard
See price list for current availability.

WNGA



Dimensions	(l)	d	d_1	s		
43	.342	1/2	.203	3/16		

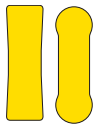
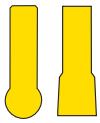
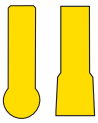
All dimensions [in]

For tools see pages: T30, T34

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		TB310															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**WNGA 432S00420**	●															1/32	.001	.008	.002	.106
	WNGA 432S00420W	●															1/32	.001	.008	.002	.106

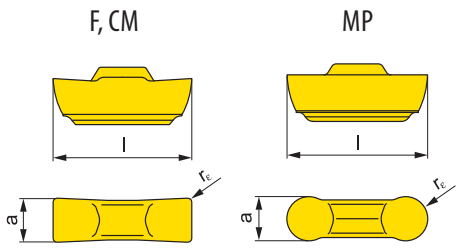
● stocked as standard / ○ not stocked as standard
See price list for current availability.

LINE - INSERTS FOR PARTING AND GROOVING

LCMF 13	LCMF 16	LCMF 20	LCMR 13	LCMR 16
				
T241	T242 - T243	T244	T245	T246

LFMX	TN ..ER/L ...ZZ	TN ..NR/L ...ZZ	TN ..ER/L-R	TN..NR/L-R
				
T247	T249	T250	T251	T252

LCMF 13



Dimensions	a	tol. a	l			
0313	.118	±.002	.496			
0413	.157	±.002	.496			

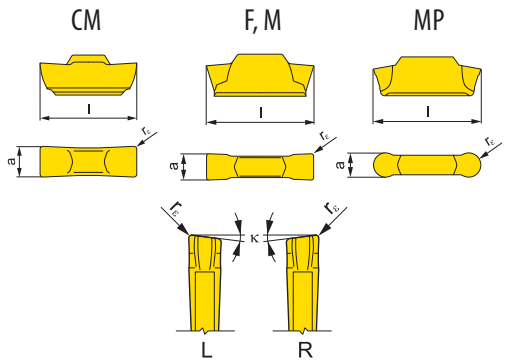
All dimensions [in]

For tools see pages: T60-T71, T73, T76

Chip breaker	Designation	Grades															Radius	Feed/rev.		Depth of cut	
		T9325	T8330														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LCMF 031304-CM**		●														1/64	.002	.012	-	-
	LCMF 031304-CM-04*		●														1/64	.002	.012	-	-
	LCMF 041304-CM		●														1/64	.002	.012	-	-
	**LCMF 031302-F**		●														1/128	.002	.008	.012	.118
	LCMF 031304-F		●														1/64	.002	.010	.012	.118
	LCMF 031304-F-04*		●														1/64	.002	.008	.012	.079
	LCMF 041304-F	●	●														1/64	.004	.010	.020	.118
	**LCMF 0313M0-MP**		●														0.059	.002	.012	.020	.059
	LCMF 0413M0-MP		●														0.079	.002	.014	.020	.079

* For internal holder A... - GG.R/L 0313-04

LCMF 16



Dimensions	a	tol. a	l
0316	.118	±.002	.646
0416	.157	±.002	.646
0516	.197	±.002	.646
0616	.236	±.002	.646
0830	.315	±.002	1.181

All dimensions [in]

For tools see pages: T60-T71, T73, T76

Chip breaker	Designation	Grades T9325	Grades T8330	χ°	Radius r_ε	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
	LCMF 031602-CM		●	-	1/128	.002	.012	-	-
	LCMF 031604-CM		●	-	1/64	.002	.012	-	-
	LCMF 041602-CM		●	-	1/128	.002	.012	-	-
	LCMF 041604-CM		●	-	1/64	.002	.012	-	-
	LCMF 051604-CM		●	-	1/64	.004	.016	-	-
	LCMF 061604-CM		●	-	1/64	.004	.016	-	-
	LCMF 031602R6-CM		●	6	1/128	.002	.012	-	-
	LCMF 031602R15-CM*		●	15	1/128	.002	.012	-	-
	LCMF 041602R6-CM		●	6	1/128	.002	.012	-	-
	LCMF 041602R15-CM*		●	15	1/128	.002	.012	-	-
	LCMF 031602L6-CM		●	6	1/128	.002	.012	-	-
	LCMF 031602L15-CM*		●	15	1/128	.002	.012	-	-
	LCMF 041602L6-CM		●	6	1/128	.002	.012	-	-
	LCMF 041602L15-CM*		●	15	1/128	.002	.012	-	-
	LCMF 031602-F		●	-	1/128	.002	.007	.012	.118
	LCMF 031604-F		●	-	1/64	.002	.007	.012	.118
	LCMF 041604-F	●	●	-	1/64	.003	.010	.020	.118
	LCMF 041608-F	●	●	-	1/32	.003	.010	.020	.118
	LCMF 051608-F	●	●	-	1/32	.004	.012	.020	.118
	LCMF 061608-F	●	●	-	1/32	.004	.014	.020	.118
	LCMF 083008-F		●	-	1/32	.004	.020	.031	.236
	LCMF 083012-F		●	-	3/64	.010	.020	.047	.236
	LCMF 031602-M		●	-	1/128	.004	.010	.012	.118
	LCMF 031604-M		●	-	1/64	.004	.010	.012	.118
	LCMF 041604-M	●	●	-	1/64	.006	.014	.020	.118
	LCMF 041608-M	●	●	-	1/32	.006	.014	.020	.118
	LCMF 051608-M	●	●	-	1/32	.007	.017	.020	.118
	LCMF 061608-M	●	●	-	1/32	.008	.020	.020	.118

* Toolholders have to be modified.

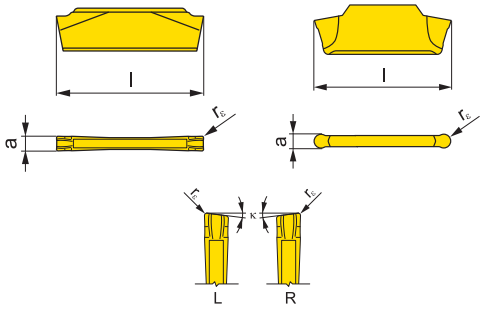
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

Chip breaker	Designation	Grades															χ°	Radius	Feed/rev.		Depth of cut	
		T9325	T8330															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LCMF 0316M0-MP**		●														-	0.059	.002	.016	.020	.059
	LCMF 0416M0-MP	●	●														-	0.079	.003	.024	.031	.079
	LCMF 0516M0-MP	●	●														-	0.098	.003	.028	.031	.098
	LCMF 0616M0-MP	●	●														-	1.118	.003	.031	.039	.118
	LCMF 0830M0-MP		●														-	0.158	.004	.039	.039	.157

LCMF 20

F1, M2 MP



Dimensions	a	tol. a	l			
0220	.079	±.0012	.768			

All dimensions [in]

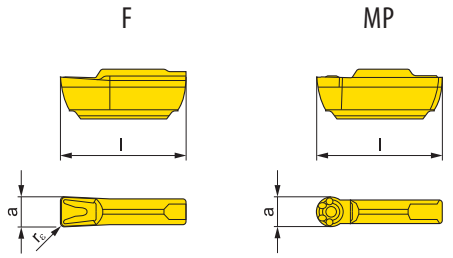
For tools see pages: T60-T71, T73, T76

Chip breaker	Designation	Grades															χ°	Radius	Feed/rev.		Depth of cut	
		T8330																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	LCMF 022002-F1	●															-	1/128	.003	.008	.008	.079
	LCMF 022002-M2	●															-	1/128	.004	.009	.008	.079
	LCMF 022002L6-M2	●															6	1/128	.002	.008	-	-
	LCMF 022002R6-M2	●															6	1/128	.002	.008	-	-
	LCMF 0220M0-MP	●															-	0.039	.003	.016	.008	.039

● stocked as standard /○ not stocked as standard
See price list for current availability.

PRAMET

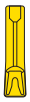
LCMR 13



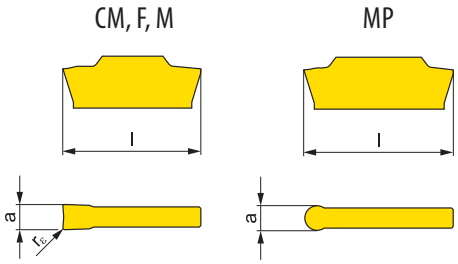
Dimensions	a	tol. a	l			
0313	.118	±.002	.496			
0413	.157	±.002	.496			

All dimensions [in]

For tools see pages: T60-T71, T73, T76

Chip breaker	Designation	Grades													χ°	Radius	Feed/rev.		Depth of cut	
		T8330														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LCMR 031304-F**	●													-	1/64	.002	.010	.012	.118
	LCMR 041304-F	●													-	1/64	.004	.010	.020	.118
	**LCMR 0313M0-MP**	●													-	0.059	.002	.012	.020	.059
	LCMR 0413M0-MP	●													-	0.079	.002	.014	.020	.079

LCMR 16



Dimensions	a	tol. a	l
0316	.118	±.002	.646
0416	.157	±.002	.646
0516	.197	±.002	.646
0616	.236	±.002	.646
0830	.315	±.002	1.181

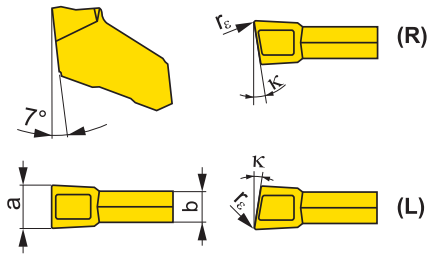
All dimensions [in]

For tools see pages: T60-T71, T73, T76

Chip breaker	Designation	Grades														χ°	Radius	Feed/rev.		Depth of cut	
		T8330															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	LCMR 031602-CM	●														-	1/128	.002	.012	-	-
	LCMR 041604-CM	●														-	1/64	.002	.012	-	-
	LCMR 031604-F	●														-	1/64	.002	.007	.012	.118
	LCMR 041604-F	●														-	1/64	.003	.010	.020	.118
	LCMR 051604-F	●														-	1/64	.004	.012	.020	.118
	LCMR 061608-F	●														-	1/32	.004	.014	.020	.118
	LCMR 083008-F	●														-	1/32	.004	.020	.031	.236
	LCMR 031604-M	●														-	1/64	.004	.010	.012	.118
	LCMR 041604-M	●														-	1/64	.006	.014	.020	.118
	LCMR 051604-M	●														-	1/64	.007	.017	.020	.118
	LCMR 061608-M	●														-	1/32	.008	.020	.020	.118
	LCMR 0316M0-MP	●														-	0.059	.002	.016	.020	.059
	LCMR 0416M0-MP	●														-	0.079	.003	.024	.031	.079
	LCMR 0516M0-MP	●														-	0.098	.003	.028	.031	.098
	LCMR 0616M0-MP	●														-	1.118	.004	.031	.039	.118

● stocked as standard /○ not stocked as standard
See price list for current availability.

LFMX



Dimensions	a	tol. a	b	r_e		
1.5	.059	±.0012	.051	0.006		
1.6	.063	±.0012	.051	0.006		
2.0	.079	±.0012	.063	0.006		
2.2	.087	±.0012	.063	0.006		
3.1	.122	±.0015	.102	0.008		
4.1	.161	±.0015	.142	0.008		
5.1	.201	±.0015	.181	0.008		
6.3	.250	±.0015	.228	0.008		

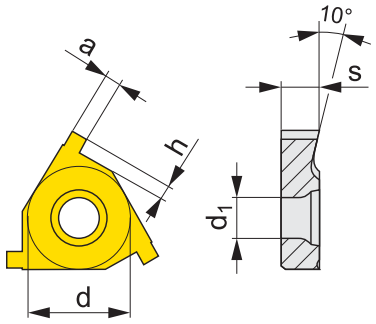
All dimensions [in]

For tools see pages: T74-T75, T77

Chip breaker	Designation	Grades														χ°	Radius	Feed/rev.		Depth of cut	
		6640	T8330														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	LFMX 1.5-.16ENF1		●													-	0.006	.002	.004	-	-
	LFMX 1.6-.16ENF1		●													-	0.006	.002	.004	-	-
	LFMX 2.0-.16ENF1		●													-	0.006	.002	.005	-	-
	LFMX 3.1-.20ENF1		●													-	0.008	.002	.006	-	-
	LFMX 4.1-.20ENF1		●													-	0.008	.002	.007	-	-
	LFMX 2.0-.16SNF2	●	●													-	0.006	.002	.006	-	-
	LFMX 3.1-.20SNF2	●	●													-	0.008	.003	.007	-	-
	LFMX 3.1-.20TNF2	●	●													-	0.008	.002	.007	-	-
	LFMX 4.1-.20SNF2		●													-	0.008	.003	.009	-	-
	LFMX 4.1-.20TNF2		●													-	0.008	.002	.009	-	-
	LFMX 5.1-.20SNF2		●													-	0.008	.003	.010	-	-
	LFMX 6.35-.20SNF2		●													-	0.008	.003	.012	-	-
	LFMX 2.0-.16SNM2	●	●													-	0.006	.003	.007	-	-
	LFMX 2.2-.16SNM2	●	●													-	0.006	.003	.007	-	-
	LFMX 3.1-.20SNM2	●	●													-	0.008	.003	.008	-	-
	LFMX 3.1-.20TNM2	●	●													-	0.008	.002	.008	-	-
	LFMX 4.1-.20SNM2	●	●													-	0.008	.003	.010	-	-
	LFMX 4.1-.20TNM2	●	●													-	0.008	.002	.010	-	-
	LFMX 5.1-.20SNM2	●	●													-	0.008	.003	.012	-	-
	LFMX 6.35-.20SNM2	●	●													-	0.008	.003	.014	-	-
	LFMX 2.0-.16SR6M2		●													6	0.006	.002	.006	-	-
	LFMX 2.0-.16SR12M2		●													12	0.006	.002	.005	-	-
	LFMX 3.1-.20SR8M2		●													8	0.008	.003	.006	-	-
	LFMX 4.1-.20SR8M2		●													8	0.008	.003	.008	-	-
	LFMX 2.0-.16SL6M2		●													6	0.006	.002	.006	-	-
	LFMX 2.0-.16SL12M2		●													12	0.006	.002	.005	-	-
	LFMX 3.1-.20SL8M2		●													8	0.008	.003	.006	-	-
	LFMX 4.1-.20SL8M2		●													8	0.008	.003	.008	-	-

● stocked as standard / ○ not stocked as standard
See price list for current availability.

TN ..ER/L ...ZZ DIN 471
EXTERNAL



Dimensions	d	d_1	s			
16	3/8	.154	.138			
22	1/2	.193	.185			

All dimensions [in]

For tools see pages: T80-T83

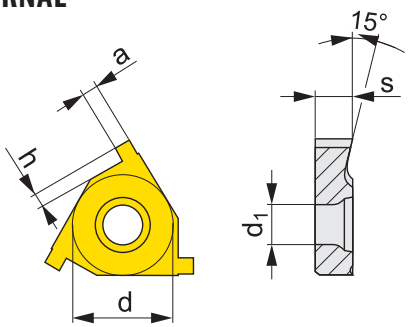
Chip breaker	Designation	Grades								a	Tolerance		h	Feed/rev.		Depth of cut	
		T8330									min	max		f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 16ER110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16ER130ZZ	●								.051	.002	.004	.063	-	-	-	-
	TN 16ER160ZZ	●								.063	.002	.004	.073	-	-	-	-
	**TN 16ER185ZZ**	●								.073	.002	.004	.073	-	-	-	-
	TN 16ER215ZZ	●								.085	.002	.004	.073	-	-	-	-
	TN 16ER265ZZ	●								.104	.002	.004	.081	-	-	-	-
	TN 22ER265ZZ	●								.104	.003	.005	.087	-	-	-	-
	TN 22ER315ZZ	●								.124	.003	.005	.087	-	-	-	-
	TN 22ER415ZZ	●								.163	.003	.005	.102	-	-	-	-
	TN 16EL090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 16EL110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16EL130ZZ	●								.051	.002	.004	.063	-	-	-	-
	TN 16EL160ZZ	●								.063	.002	.004	.073	-	-	-	-
	**TN 16EL185ZZ**	●								.073	.002	.004	.073	-	-	-	-
	TN 16EL215ZZ	●								.085	.002	.004	.073	-	-	-	-
	TN 16EL265ZZ	●								.104	.002	.004	.081	-	-	-	-
	TN 22EL265ZZ	●								.104	.003	.005	.087	-	-	-	-
	TN 22EL315ZZ	●								.124	.003	.005	.087	-	-	-	-
	TN 22EL415ZZ	●								.163	.003	.005	.102	-	-	-	-

Recommended shim PE ZZ (page 230)

● stocked as standard /○ not stocked as standard
See price list for current availability.

TN ..ER/L ...ZZ DIN 472

INTERNAL



Dimensions	d	d_1	s			
11	1/4	.110	.118			
16	3/8	.154	.138			
22	1/2	.193	.185			

All dimensions [in]

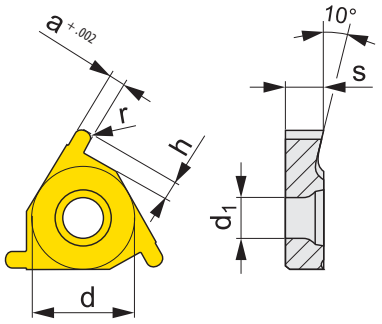
For tools see pages: T80-T83

Chip breaker	Designation	Grades								a	Tolerance		h	Feed/rev.		Depth of cut	
		T8330									min	max		f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 11NR090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 11NR110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16NR090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 16NR110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16NR130ZZ	●								.051	.002	.004	.063	-	-	-	-
	TN 16NR160ZZ	●								.063	.002	.004	.073	-	-	-	-
	TN 16NR185ZZ	●								.073	.002	.004	.073	-	-	-	-
	TN 16NR215ZZ	●								.085	.002	.004	.073	-	-	-	-
	TN 16NR265ZZ	●								.104	.002	.004	.081	-	-	-	-
	TN 22NR265ZZ	●								.104	.003	.005	.087	-	-	-	-
	TN 22NR315ZZ	●								.124	.003	.005	.087	-	-	-	-
	TN 22NR415ZZ	●								.163	.003	.005	.102	-	-	-	-
	TN 11NL090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 11NL110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16NL090ZZ	●								.035	.002	.004	.035	-	-	-	-
	TN 16NL110ZZ	●								.043	.002	.004	.051	-	-	-	-
	TN 16NL130ZZ	●								.051	.002	.004	.063	-	-	-	-
	TN 16NL160ZZ	●								.063	.002	.004	.073	-	-	-	-
	TN 16NL185ZZ	●								.073	.002	.004	.073	-	-	-	-
	TN 16NL215ZZ	●								.085	.002	.004	.073	-	-	-	-
	TN 16NL265ZZ	●								.104	.002	.004	.081	-	-	-	-
	TN 22NL265ZZ	●								.104	.003	.005	.087	-	-	-	-
	TN 22NL315ZZ	●								.124	.003	.005	.087	-	-	-	-
	TN 22NL415ZZ	●								.163	.003	.005	.102	-	-	-	-

Recommended shim PE ZZ (page 230)

● stocked as standard / ○ not stocked as standard
See price list for current availability.

TN ..ER/L-R
EXTERNAL



Dimensions	d	d_1	s			
16	3/8	.154	.138			
22	1/2	.193	.185			

All dimensions [in]

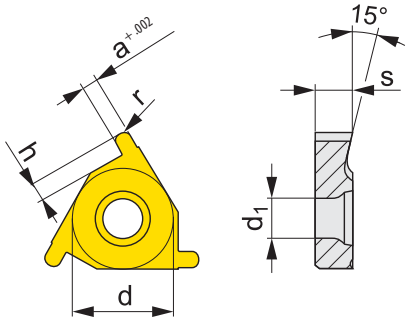
For tools see pages: T80-T83

Chip breaker	Designation	Grades								r	a	h	Feed/rev.		Depth of cut	
		T8330											f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 16ER-R050**	●								.020	.039	.051	-	-	-	-
	TN 16ER-R100	●								.039	.079	.073	-	-	-	-
	TN 22ER-R150	●								.059	.118	.087	-	-	-	-
	**TN 16EL-R050**	●								.020	.039	.051	-	-	-	-
	TN 16EL-R100	●								.039	.079	.073	-	-	-	-
	TN 22EL-R150	●								.059	.118	.087	-	-	-	-

Recommended shim PE ZZ (page 230)

● stocked as standard /○ not stocked as standard
See price list for current availability.

TN ..NR/L-R
INTERNAL



Dimensions	d	d_1	s			
11	1/4	.110	.150			
16	3/8	.154	.138			
22	1/2	.193	.185			

All dimensions [in]

For tools see pages: T80-T83

Chip breaker	Designation	Grades								r	a	h	Feed/rev.		Depth of cut	
		T8330											f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 11NR-R050	●								.020	.039	.051	-	-	-	-
	TN 16NR-R100	●								.039	.079	.073	-	-	-	-
	TN 22NR-R150	●								.059	.118	.087	-	-	-	-
	TN 11NL-R050	●								.020	.039	.051	-	-	-	-
	TN 16NL-R100	●								.039	.079	.073	-	-	-	-
	TN 22NL-R150	●								.059	.118	.087	-	-	-	-

Recommended shim PE ZZ (page 230)

● stocked as standard / ○ not stocked as standard
See price list for current availability.

CODE DESIGNATION - INDEXABLE CUTTING INSERTS FOR THREADING

1

Insert shape

T

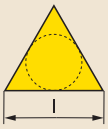
2

Clearance angle

N

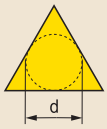
3

Cutting edge length



l

[mm]	[in]
11	.433
16	.650
22	.866



d = I.C.

[mm]	[in]
6,350	1/4
9,525	3/8
12,700	1/2

4

Internal

External

E

Internal

N

ISO CODE

1	2	3	4	5	6	7		8
T	N	16	E	R	175	M	-	P1

ANSI CODE

1	2	3	4	5	6	7		8
T	N	16	E	R	120	W	-	P1

5

Direction of cut

Right

R

Left

L

Neutral

N

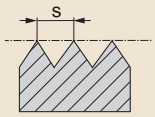
8

Chip breaker

P1	Pressed

6

Thread pitch



s x 100

Thread Pitch, mm x100

6

Thread pitch

Thread pitch

N°. of threads per inch x 10

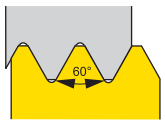
7

Thread profile

M	Metric 60° ISO 965/1-1980	**TR**	TR 30° ISO 2901/3-1977
W	Whitworth 55° ISO 228-1982	**UN**	American UN 60° ISO 5864-1978
RD	Round 30° DIN 405-1981	**ACME**	ACME 29° ANSI B1.5-1988
BSPT	ISO 228/1 35 21 1959 ISO 7/1	**API**	API
NPT	ANSI B1.1-1983		

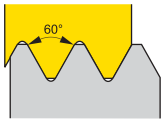
M
Full profile

TN ..ER/EL...M



T152

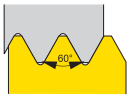
TN ..NR/NL...M



T153 - 154

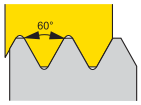
M
Partial profile

TN ..ER/EL...60°



T155

TN ..NR/NL...60°



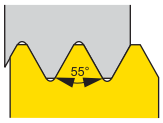
T156

TN ..EN/NN....60°

T157

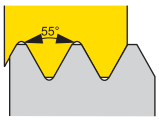
W
Full profile

TN ..ER/EL...W



T158

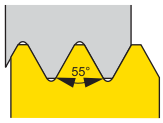
TN ..NR/NL...W



T159

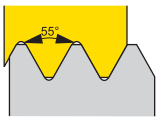
W
Partial profile

TN ..ER/EL...W



T160

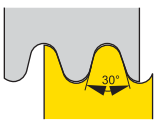
TN ..NR/NL...W



T161

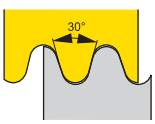
RD
Full profile

TN ..ER/EL...RD



T162

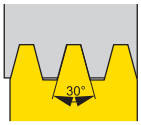
TN ..NR/NL...RD



T163

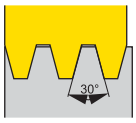
TR
Full profile

TN ..ER/EL...TR



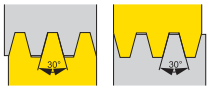
T164

TN ..NR/NL...TR



T165

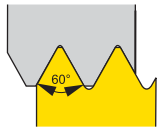
TN ..EN/NN...TR



T166

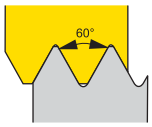
UN
Full profile

TN ..ER/EL...UN



T167

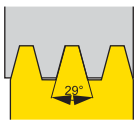
TN ..NR/NL...UN



T168

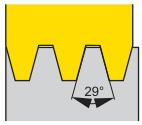
ACME
Full profile

TN ..ER/EL...ACME



T169

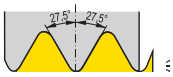
TN ..NR/NL...ACME



T170

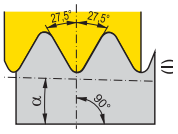
BSPT
Full profile

TN ..ER/EL..BSPT



T171

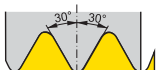
TN ..NR/NL..BSPT



T171

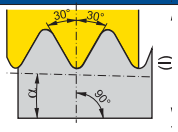
NPT
Full profile

TN ..ER/EL...NPT



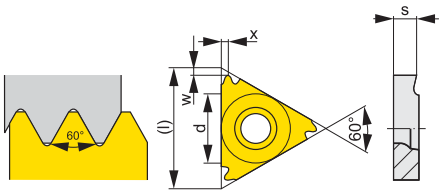
T172

TN ..NR/NL...NPT



T172

METRIC 60°
ISO 965/1-1980
FULL PROFILE
EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

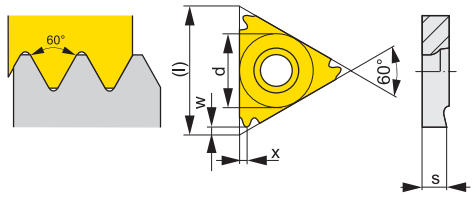
All dimensions [in]

For tools see pages: T80

Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER050M	0,50	●								.020	.051	-	-	-	-
	TN 16ER075M	0,75	●								.020	.051	-	-	-	-
	TN 16ER080M	0,80	●								.020	.051	-	-	-	-
	TN 16ER100M	1,00	●								.028	.051	-	-	-	-
	TN 16ER125M	1,25	●								.031	.051	-	-	-	-
	TN 16ER150M	1,50	●								.039	.051	-	-	-	-
	**TN 16ER175M**	1,75	●								.055	.051	-	-	-	-
	TN 16ER200M	2,00	●								.055	.051	-	-	-	-
	TN 16ER250M	2,50	●								.055	.051	-	-	-	-
	TN 16ER300M	3,00	●								.059	.063	-	-	-	-
	TN 22ER350M	3,50	●								.091	.063	-	-	-	-
	TN 22ER400M	4,00	●								.091	.063	-	-	-	-
	TN 22ER450M	4,50	●								.094	.063	-	-	-	-
	TN 22ER500M	5,00	●								.098	.071	-	-	-	-
	TN 16EL050M	0,50	●								.020	.051	-	-	-	-
	TN 16EL075M	0,75	●								.020	.051	-	-	-	-
	TN 16EL080M	0,80	●								.020	.051	-	-	-	-
	TN 16EL100M	1,00	●								.028	.051	-	-	-	-
	TN 16EL125M	1,25	●								.031	.051	-	-	-	-
	TN 16EL150M	1,50	●								.039	.051	-	-	-	-
	**TN 16EL175M**	1,75	●								.055	.051	-	-	-	-
	TN 16EL200M	2,00	●								.055	.051	-	-	-	-
	TN 16EL250M	2,50	●								.055	.051	-	-	-	-
	TN 16EL300M	3,00	●								.059	.063	-	-	-	-
	TN 22EL350M	3,50	●								.091	.063	-	-	-	-
	TN 22EL400M	4,00	●								.091	.063	-	-	-	-
	TN 22EL450M	4,50	●								.094	.063	-	-	-	-
	TN 22EL500M	5,00	●								.098	.071	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

METRIC 60°
ISO 965/1-1980
FULL PROFILE
INTERNAL



Dimensions	(l)	d	s
11	.433	1/4	.118
16	.650	3/8	.137
22	.866	1/2	.185

All dimensions [in]

For tools see pages: T82

Chip breaker	Designation	Pitch [mm]	Grades	x	w	Feed/rev.		Depth of cut	
			T8030			f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 11NR050M**	0,50	●	.020	.051	-	-	-	-
	TN 11NR075M	0,75	●	.020	.051	-	-	-	-
	TN 11NR100M	1,00	●	.028	.051	-	-	-	-
	TN 11NR125M	1,25	●	.031	.051	-	-	-	-
	TN 11NR150M	1,50	●	.039	.051	-	-	-	-
	TN 11NR200M	2,00	●	.039	.051	-	-	-	-
	TN 16NR050M	0,50	●	.020	.051	-	-	-	-
	TN 16NR075M	0,75	●	.020	.051	-	-	-	-
	TN 16NR100M	1,00	●	.028	.051	-	-	-	-
	TN 16NR125M	1,25	●	.031	.051	-	-	-	-
	TN 16NR150M	1,50	●	.039	.051	-	-	-	-
	TN 16NR175M	1,75	●	.055	.051	-	-	-	-
	TN 16NR200M	2,00	●	.055	.051	-	-	-	-
	TN 16NR250M	2,50	●	.055	.051	-	-	-	-
	TN 16NR300M	3,00	●	.059	.051	-	-	-	-
	TN 22NR350M	3,50	●	.091	.063	-	-	-	-
	TN 22NR400M	4,00	●	.091	.063	-	-	-	-
	TN 22NR450M	4,50	●	.094	.063	-	-	-	-
	TN 22NR500M	5,00	●	.098	.071	-	-	-	-
	TN 11NL050M	0,50	●	.020	.051	-	-	-	-
	TN 11NL075M	0,75	●	.020	.051	-	-	-	-
	TN 11NL100M	1,00	●	.028	.051	-	-	-	-
	TN 11NL125M	1,25	●	.031	.051	-	-	-	-
	TN 11NL150M	1,50	●	.039	.051	-	-	-	-
	TN 11NL200M	2,00	●	.039	.051	-	-	-	-
	**TN 16NL050M**	0,50	●	.020	.051	-	-	-	-
	TN 16NL075M	0,75	●	.020	.051	-	-	-	-
	TN 16NL100M	1,00	●	.028	.051	-	-	-	-
	TN 16NL125M	1,25	●	.031	.051	-	-	-	-
	TN 16NL150M	1,50	●	.039	.051	-	-	-	-
	TN 16NL175M	1,75	●	.055	.051	-	-	-	-
	TN 16NL200M	2,00	●	.055	.051	-	-	-	-

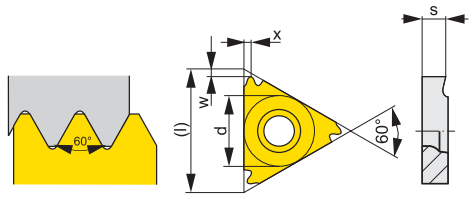
Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 16NL250M**	2,50	●								.055	.051	-	-	-	-
	TN 16NL300M	3,00	●								.059	.051	-	-	-	-
	TN 22NL350M	3,50	●								.091	.063	-	-	-	-
	TN 22NL400M	4,00	●								.091	.063	-	-	-	-
	TN 22NL500M	5,00	●								.098	.071	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

METRIC 60°

PARTIAL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: 80

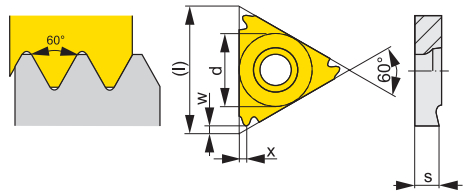
Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ERA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	TN 16ERAG60	0,50 - 3,00	●								.059	.043	-	-	-	-
	TN 16ERG60	1,75 - 3,00	●								.059	.043	-	-	-	-
	TN 22ERN60	3,50 - 5,00	●								.098	.071	-	-	-	-
	TN 16ELA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	TN 16ELAG60	0,50 - 3,00	●								.059	.043	-	-	-	-
	TN 16ELG60	1,75 - 3,00	●								.059	.043	-	-	-	-
	TN 22ELN60	3,50 - 5,00	●								.098	.071	-	-	-	-

● stocked as standard / ○ not stocked as standard
See price list for current availability.

METRIC 60°

PARTIAL PROFILE

INTERNAL



Dimensions	(l)	d	s			
11	.433	1/4	.118			
16	.650	3/8	.137			
22	.866	1/2	.181			

All dimensions [in]

For tools see pages: T82

Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 11NRA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	TN 16NRA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	**TN 16NRAG60**	0,50 - 3,00	●								.059	.043	-	-	-	-
	TN 16NRG60	1,75 - 3,00	●								.059	.043	-	-	-	-
	TN 22NRN60	3,50 - 5,00	●								.098	.071	-	-	-	-
	TN 11NLA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	TN 16NLA60	0,50 - 1,50	●								.031	.024	-	-	-	-
	**TN 16NLAG60**	0,50 - 3,00	●								.059	.043	-	-	-	-
	TN 16NLG60	1,75 - 3,00	●								.059	.043	-	-	-	-
	TN 22NLN60	3,50 - 5,00	●								.098	.071	-	-	-	-

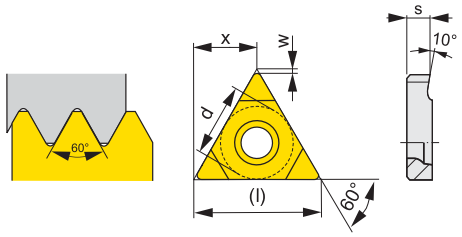
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

METRIC 60° - S

PARTIAL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
22	.866	1/2	.181			

All dimensions [in]

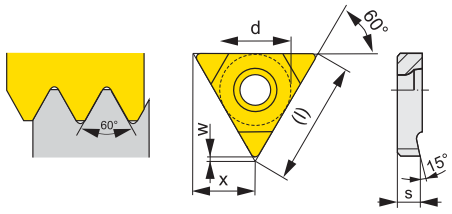
For tools see pages: T81

Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 22EN350-500M	3,50 - 5,00	●								.433	.030	-	-	-	-
	TN 22EN550-800M	5,50 - 8,00	●								.433	.049	-	-	-	-

METRIC 60° - S

PARTIAL PROFILE

INTERNAL



Dimensions	(l)	d	s			
22	.866	1/2	.181			

All dimensions [in]

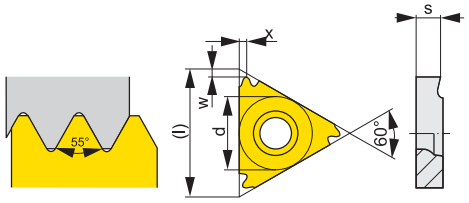
For tools see pages: T83

Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 22NN350-500M	3,50 - 5,00	●								.433	.026	-	-	-	-
	TN 22NN550-800M	5,50 - 8,00	●								.433	.037	-	-	-	-

WHITWORTH 55° ISO 228-1982

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T80

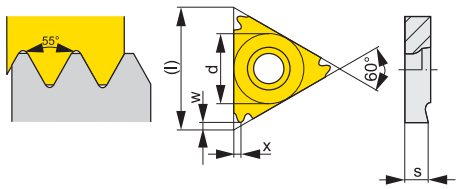
Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER280W	28.0	●								.028	.024	-	-	-	-
	TN 16ER200W	20.0	●								.035	.031	-	-	-	-
	TN 16ER190W	19.0	●								.039	.031	-	-	-	-
	TN 16ER180W	18.0	●								.039	.031	-	-	-	-
	TN 16ER160W	16.0	●								.043	.035	-	-	-	-
	TN 16ER140W	14.0	●								.047	.039	-	-	-	-
	TN 16ER120W	12.0	●								.055	.043	-	-	-	-
	**TN 16ER110W**	11.0	●								.059	.043	-	-	-	-
	TN 16ER100W	10.0	●								.059	.047	-	-	-	-
	TN 16ER090W	9.0	●								.067	.047	-	-	-	-
	TN 16ER080W	8.0	●								.059	.047	-	-	-	-
	TN 22ER070W	7.0	●								.091	.063	-	-	-	-
	TN 22ER060W	6.0	●								.091	.063	-	-	-	-
	TN 22ER050W	5.0	●								.094	.067	-	-	-	-
	TN 16EL280W	28.0	●								.028	.024	-	-	-	-
	TN 16EL200W	20.0	●								.035	.031	-	-	-	-
	TN 16EL190W	19.0	●								.039	.031	-	-	-	-
	TN 16EL160W	16.0	●								.043	.035	-	-	-	-
	TN 16EL140W	14.0	●								.047	.039	-	-	-	-
	TN 16EL120W	12.0	●								.055	.043	-	-	-	-
	**TN 16EL110W**	11.0	●								.059	.043	-	-	-	-
	TN 16EL100W	10.0	●								.059	.043	-	-	-	-
	TN 16EL090W	9.0	●								.067	.047	-	-	-	-
	TN 16EL080W	8.0	●								.059	.047	-	-	-	-
	TN 22EL070W	7.0	●								.091	.063	-	-	-	-
	TN 22EL060W	6.0	●								.091	.063	-	-	-	-
	TN 22EL050W	5.0	●								.094	.067	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

WHITWORTH 55° ISO 228-1982

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s			
11	.433	1/4	.118			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

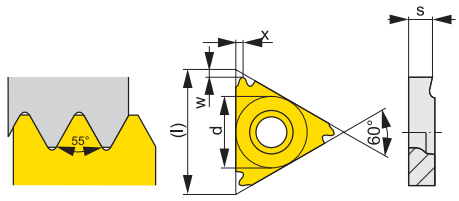
For tools see pages: T82

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 11NR190W	19.0	●								.039	.031	-	-	-	-
	TN 11NR140W	14.0	●								.047	.031	-	-	-	-
	TN 16NR280W	28.0	●								.028	.024	-	-	-	-
	TN 16NR200W	20.0	●								.035	.031	-	-	-	-
	TN 16NR190W	19.0	●								.039	.031	-	-	-	-
	TN 16NR160W	16.0	●								.043	.035	-	-	-	-
	TN 16NR140W	14.0	●								.047	.039	-	-	-	-
	**TN 16NR120W**	12.0	●								.055	.043	-	-	-	-
	TN 16NR110W	11.0	●								.059	.043	-	-	-	-
	TN 16NR100W	10.0	●								.059	.047	-	-	-	-
	TN 16NR090W	9.0	●								.067	.047	-	-	-	-
	TN 16NR080W	8.0	●								.059	.047	-	-	-	-
	TN 22NR070W	7.0	●								.091	.063	-	-	-	-
	TN 22NR060W	6.0	●								.091	.063	-	-	-	-
	TN 22NR050W	5.0	●								.094	.067	-	-	-	-
	TN 11NL190W	19.0	●								.039	.031	-	-	-	-
	TN 11NL140W	14.0	●								.047	.031	-	-	-	-
	TN 16NL280W	28.0	●								.028	.024	-	-	-	-
	TN 16NL200W	20.0	●								.035	.031	-	-	-	-
	TN 16NL190W	19.0	●								.039	.031	-	-	-	-
	TN 16NL160W	16.0	●								.043	.035	-	-	-	-
	TN 16NL140W	14.0	●								.047	.039	-	-	-	-
	**TN 16NL120W**	12.0	●								.055	.043	-	-	-	-
	TN 16NL110W	11.0	●								.059	.043	-	-	-	-
	TN 16NL100W	10.0	●								.059	.043	-	-	-	-
	TN 16NL090W	9.0	●								.067	.047	-	-	-	-
	TN 16NL080W	8.0	●								.059	.047	-	-	-	-
	TN 22NL070W	7.0	●								.091	.063	-	-	-	-
	TN 22NL060W	6.0	●								.091	.063	-	-	-	-
	TN 22NL050W	5.0	●								.094	.067	-	-	-	-

WHITWORTH 55° ISO 228-1982

PARTIAL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T80

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ERA55	48 - 16	●								.031	.024	-	-	-	-
	TN 16ERAG55	48 - 8	●								.059	.043	-	-	-	-
	TN 16ERG55	14 - 8	●								.059	.043	-	-	-	-
	TN 22ERN55	7 - 5	●								.098	.071	-	-	-	-
	TN 16ELA55	48 - 16	●								.031	.024	-	-	-	-
	TN 16ELAG55	48 - 8	●								.059	.043	-	-	-	-
	TN 16ELG55	14 - 8	●								.059	.043	-	-	-	-
	TN 22ELN55	7 - 5	●								.098	.071	-	-	-	-

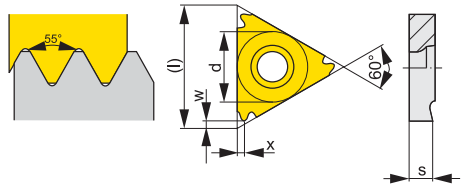
PRAMET

● stocked as standard /○ not stocked as standard
See price list for current availability.

WHITWORTH 55° ISO 228-1982

PARTIAL PROFILE

INTERNAL



Dimensions	(l)	d	s			
11	.433	1/4	.118			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

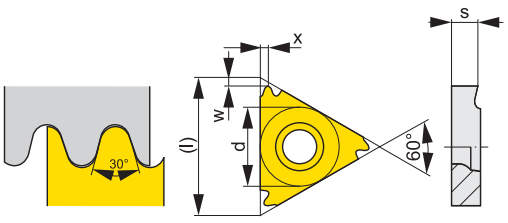
For tools see pages: T82

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 11NRA55	48 - 16	●								.031	.024	-	-	-	-
	TN 16NRA55	48 - 16	●								.031	.024	-	-	-	-
	**TN 16NRAG55**	48 - 8	●								.059	.043	-	-	-	-
	TN 16NRG55	14 - 8	●								.059	.043	-	-	-	-
	TN 22NRN55	7 - 5	●								.098	.071	-	-	-	-
	TN 11NLA55	48 - 16	●								.031	.024	-	-	-	-
	TN 16NLA55	48 - 16	●								.031	.024	-	-	-	-
	**TN 16NLAG55**	48 - 8	●								.059	.043	-	-	-	-
	TN 16NLG55	14 - 8	●								.059	.043	-	-	-	-
	TN 22NLN55	7 - 5	●								.098	.071	-	-	-	-

RD 30° DIN 405-1981

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T80

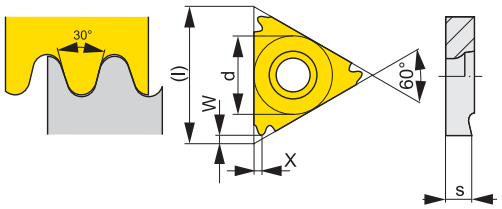
Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER100RD	10.0	●								.047	.043	-	-	-	-
	TN 16ER080RD	8.0	●								.051	.055	-	-	-	-
	TN 16ER060RD	6.0	●								.067	.059	-	-	-	-
	TN 22ER060RD	6.0	●								.098	.079	-	-	-	-
	TN 22EL060RD	6.0	●								.098	.079	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

RD 30° DIN 405-1981

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

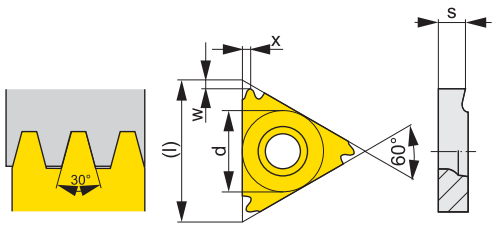
For tools see pages: T82

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16NR100RD		●								.047	.043	-	-	-	-
	TN 16NR080RD		●								.051	.055	-	-	-	-
	TN 16NR060RD		●								.067	.055	-	-	-	-
	TN 22NR060RD		●								.098	.079	-	-	-	-
	TN 22NL060RD		●								.098	.079	-	-	-	-

TR 30° DIN 103-1977, ISO 2901/3-1977

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T80

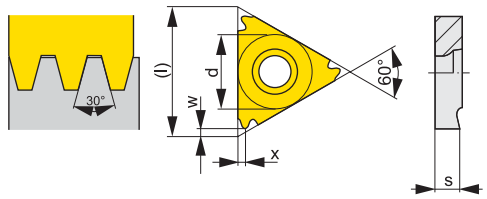
Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 16ER150TR**	1,50	●								.039	.039	-	-	-	-
	TN 16ER200TR	2,00	●								.055	.051	-	-	-	-
	TN 16ER300TR	3,00	●								.059	.051	-	-	-	-
	TN 22ER400TR	4,00	●								.091	.065	-	-	-	-
	TN 22ER500TR	5,00	●								.098	.083	-	-	-	-
	**TN 16EL150TR**	1,50	●								.039	.039	-	-	-	-
	TN 16EL200TR	2,00	●								.055	.051	-	-	-	-
	TN 16EL300TR	3,00	●								.059	.051	-	-	-	-
	TN 22EL400TR	4,00	●								.091	.065	-	-	-	-
	TN 22EL500TR	5,00	●								.098	.083	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

TR 30° DIN 103-1977, ISO 2901/3-1977

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T82

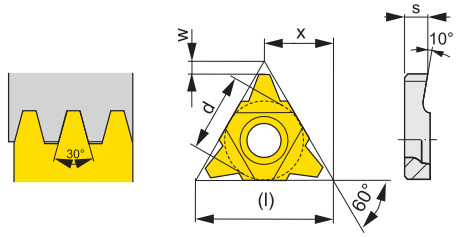
Chip breaker	Designation	Pitch [mm]	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16NR150TR	1,50	●								.039	.039	-	-	-	-
	TN 16NR200TR	2,00	●								.055	.051	-	-	-	-
	TN 16NR300TR	3,00	●								.059	.051	-	-	-	-
	TN 22NR400TR	4,00	●								.091	.065	-	-	-	-
	TN 22NR500TR	5,00	●								.098	.083	-	-	-	-
		0,00														
	TN 16NL150TR	1,50	●								.039	.039	-	-	-	-
	TN 16NL200TR	2,00	●								.055	.051	-	-	-	-
	TN 16NL300TR	3,00	●								.059	.051	-	-	-	-
	TN 22NL400TR	4,00	●								.091	.065	-	-	-	-
	TN 22NL500TR	5,00	●								.098	.083	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

TR 30° S

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s
22	.866	1/2	.181

All dimensions [in]

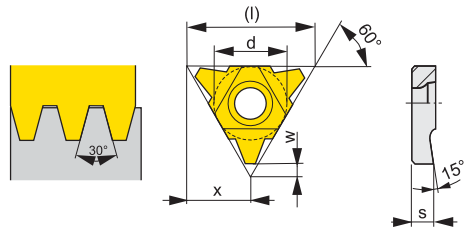
For tools see pages: T81

Chip breaker	Designation	Pitch [mm]	Grades T8030	x	w	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
	TN 22EN600TR	6,00	●	.433	.061	-	-	-	-
	TN 22EN700TR	7,00	●	.433	.073	-	-	-	-

TR 30° S

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s
22	.866	1/2	.181

All dimensions [in]

For tools see pages: T83

	Designation	Pitch [mm]	Grades T8030	x	w	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
	TN 22NN600TR	6,00	●	.433	.061	-	-	-	-
	TN 22NN700TR	7,00	●	.433	.073	-	-	-	-

PRAMET

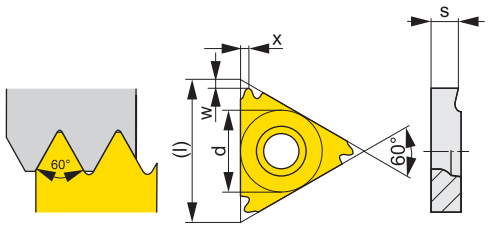
● stocked as standard /○ not stocked as standard
See price list for current availability.

UN 60°

SO 5864-1978, ANSI B1.1-1983

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T80

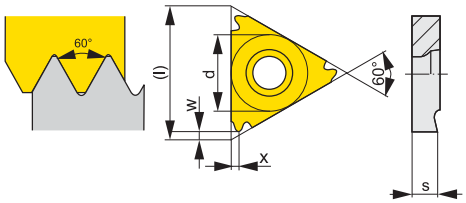
Chip breaker	Designation	Threads per in	Grades	x	w	Feed/rev.		Depth of cut	
			T8030			f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER320UN	32.0	●	.024	.024	-	-	-	-
	TN 16ER280UN	28.0	●	.028	.024	-	-	-	-
	TN 16ER240UN	24.0	●	.031	.028	-	-	-	-
	TN 16ER200UN	20.0	●	.035	.031	-	-	-	-
	TN 16ER180UN	18.0	●	.039	.031	-	-	-	-
	TN 16ER160UN	16.0	●	.043	.035	-	-	-	-
	TN 16ER140UN	14.0	●	.047	.039	-	-	-	-
	TN 16ER130UN	13.0	●	.051	.039	-	-	-	-
	**TN 16ER120UN**	12.0	●	.055	.043	-	-	-	-
	TN 16ER115UN	11.5	●	.055	.043	-	-	-	-
	TN 16ER110UN	11.0	●	.059	.043	-	-	-	-
	TN 16ER100UN	10.0	●	.059	.043	-	-	-	-
	TN 16ER090UN	9.0	●	.067	.047	-	-	-	-
	TN 16ER080UN	8.0	●	.063	.047	-	-	-	-
	TN 22ER070UN	7.0	●	.091	.063	-	-	-	-
	TN 22ER060UN	6.0	●	.091	.063	-	-	-	-
	TN 22ER050UN	5.0	●	.098	.067	-	-	-	-
	TN 16EL320UN	32.0	●	.024	.024	-	-	-	-
	TN 16EL280UN	28.0	●	.028	.024	-	-	-	-
	TN 16EL240UN	24.0	●	.031	.028	-	-	-	-
	TN 16EL200UN	20.0	●	.035	.031	-	-	-	-
	TN 16EL180UN	18.0	●	.039	.031	-	-	-	-
	TN 16EL160UN	16.0	●	.043	.035	-	-	-	-
	TN 16EL140UN	14.0	●	.047	.039	-	-	-	-
	**TN 16EL120UN**	12.0	●	.051	.043	-	-	-	-
	TN 16EL110UN	11.0	●	.055	.043	-	-	-	-
	TN 16EL100UN	10.0	●	.059	.043	-	-	-	-
	TN 16EL090UN	9.0	●	.067	.047	-	-	-	-
	TN 16EL080UN	8.0	●	.063	.047	-	-	-	-
	TN 22EL070UN	7.0	●	.091	.063	-	-	-	-
	TN 22EL060UN	6.0	●	.091	.063	-	-	-	-
	TN 22EL050UN	5.0	●	.098	.067	-	-	-	-

UN 60°

ISO 5864-1978, ANSI B1.1-1983

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

For tools see pages: T82

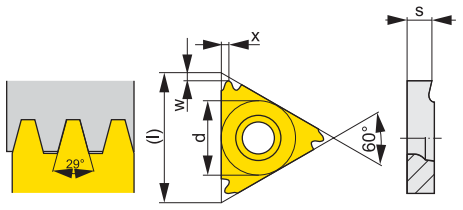
Chip breaker	Designation	Threads per in	Grades T8030	x	w	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
	TN 16NR320UN	32.0	●	.024	.024	-	-	-	-
	TN 16NR280UN	28.0	●	.028	.024	-	-	-	-
	TN 16NR240UN	24.0	●	.031	.028	-	-	-	-
	TN 16NR200UN	20.0	●	.035	.031	-	-	-	-
	TN 16NR180UN	18.0	●	.039	.031	-	-	-	-
	TN 16NR160UN	16.0	●	.043	.035	-	-	-	-
	TN 16NR140UN	14.0	●	.047	.039	-	-	-	-
	**TN 16NR130UN**	13.0	●	.051	.039	-	-	-	-
	TN 16NR120UN	12.0	●	.055	.043	-	-	-	-
	TN 16NR115UN	11.5	●	.055	.043	-	-	-	-
	TN 16NR110UN	11.0	●	.059	.043	-	-	-	-
	TN 16NR100UN	10.0	●	.059	.043	-	-	-	-
	TN 16NR080UN	8.0	●	.059	.047	-	-	-	-
	TN 22NR070UN	7.0	●	.091	.063	-	-	-	-
	TN 22NR060UN	6.0	●	.091	.063	-	-	-	-
	TN 22NR050UN	5.0	●	.098	.067	-	-	-	-
	TN 16NL320UN	32.0	●	.024	.024	-	-	-	-
	TN 16NL280UN	28.0	●	.028	.024	-	-	-	-
	TN 16NL240UN	24.0	●	.031	.028	-	-	-	-
	TN 16NL200UN	20.0	●	.035	.031	-	-	-	-
	TN 16NL180UN	18.0	●	.039	.031	-	-	-	-
	**TN 16NL160UN**	16.0	●	.043	.035	-	-	-	-
	TN 16NL140UN	14.0	●	.047	.039	-	-	-	-
	TN 16NL120UN	12.0	●	.051	.039	-	-	-	-
	TN 16NL110UN	11.0	●	.055	.043	-	-	-	-
	TN 16NL100UN	10.0	●	.059	.043	-	-	-	-
	TN 16NL080UN	8.0	●	.063	.047	-	-	-	-
	TN 22NL070UN	7.0	●	.091	.063	-	-	-	-
	TN 22NL060UN	6.0	●	.091	.063	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

ACME 29° ANSI B1,5-1988

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

All dimensions [in]

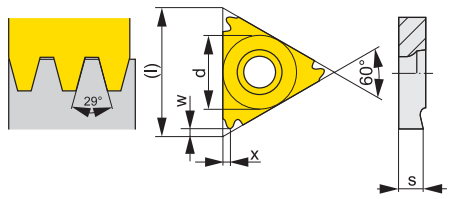
For tools see pages: T80

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16ER120ACME	12.0	●								.055	.047	-	-	-	-
	TN 16ER100ACME	10.0	●								.055	.051	-	-	-	-
	**TN 16ER080ACME**	8.0	●								.059	.055	-	-	-	-
	TN 22ER060ACME	6.0	●								.094	.083	-	-	-	-
	TN 22ER050ACME	5.0	●								.094	.075	-	-	-	-
	**TN 22EL060ACME**	6.0	●								.094	.083	-	-	-	-
	TN 22EL050ACME	5.0	●								.094	.075	-	-	-	-

ACME 29° ANSI B1,5-1988

FULL PROFILE

IINTERNAL



Dimensions	(l)	d	s			
16	.650	3/8	.137			
22	.866	1/2	.185			

For tools see pages: T82

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TN 16NR080ACME	8.0	●								.059	.059	-	-	-	-
	TN 22NR060ACME	6.0	●								.094	.083	-	-	-	-
	TN 22NR050ACME	5.0	●								.094	.075	-	-	-	-
	TN 22NL050ACME	5.0	●								.094	.075	-	-	-	-

PRAMET

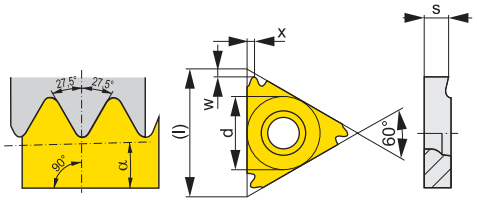
● stocked as standard /○ not stocked as standard
See price list for current availability.

BSPT

ISO 228/1 35 21 1959, ISO 7/1

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s	α		
16	.650	3/8	.137	1°47´		

All dimensions [in]

For tools see pages: T80

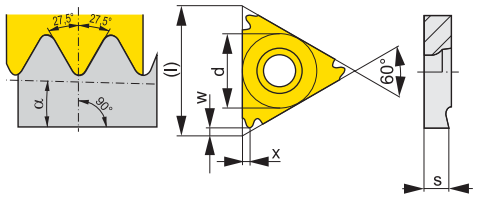
Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 16ER140BSPT**	14.0	●								.059	.047	-	-	-	-
	TN 16ER110BSPT	11.0	●								.059	.047	-	-	-	-

BSPT

ISO 228/1 35 21 1959, ISO 7/1

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s	α		
16	.650	3/8	.137	1°47´		

All dimensions [in]

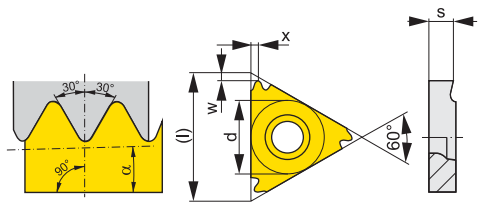
For tools see pages: T82

Chip breaker	Designation	Threads per in	Grades								x	w	Feed/rev.		Depth of cut	
			T8030										f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**TN 16NR140BSPT**	14.0	●								.059	.047	-	-	-	-
	TN 16NR110BSPT	11.0	●								.059	.047	-	-	-	-

NPT ANSI B1.1-1983

FULL PROFILE

EXTERNAL



Dimensions	(l)	d	s	α		
16	.650	3/8	.137	1°47´		

All dimensions [in]

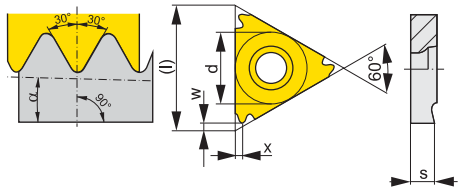
For tools see pages: T80

Chip breaker	Designation	Threads per in	Grades T8030	x	w	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
	TN 16ER270NPT	27.0	●	.031	.028	-	-	-	-
	TN 16ER180NPT	18.0	●	.031	.028	-	-	-	-
	TN 16ER140NPT	14.0	●	.059	.028	-	-	-	-
	TN 16ER115NPT	11.5	●	.059	.043	-	-	-	-
	TN 16ER080NPT	8.0	●	.063	.043	-	-	-	-

NPT ANSI B1.1-1983

FULL PROFILE

INTERNAL



Dimensions	(l)	d	s	α		
11	.433	1/4	.118	1°47´		
16	.650	3/8	.137	1°47´		

All dimensions [in]

For tools see pages: T82

Designation	Threads per in	Grades T8030	x	w	Feed/rev. f_{min}	Feed/rev. f_{max}	Depth of cut $a_{p\,min}$	Depth of cut $a_{p\,max}$
TN 11NR180NPT	18.0	●	.031	.028	-	-	-	-
TN 11NR140NPT	14.0	●	.031	.028	-	-	-	-
TN 16NR140NPT	14.0	●	.059	.028	-	-	-	-
TN 16NR115NPT	11.5	●	.059	.043	-	-	-	-
TN 16NR080NPT	8.0	●	.063	.043	-	-	-	-

● stocked as standard /○ not stocked as standard
See price list for current availability.

TECHNICAL INFORMATION

Correctly identifying the machined material is one of the most important factors when choosing the tool and the initial machining conditions. To facilitate this, the machined materials are divided into six basic groups, or into twenty-four subgroups, combining materials that qualitatively cause the same type of loading (straining) on the cutting edge and therefore a similar type of wear.

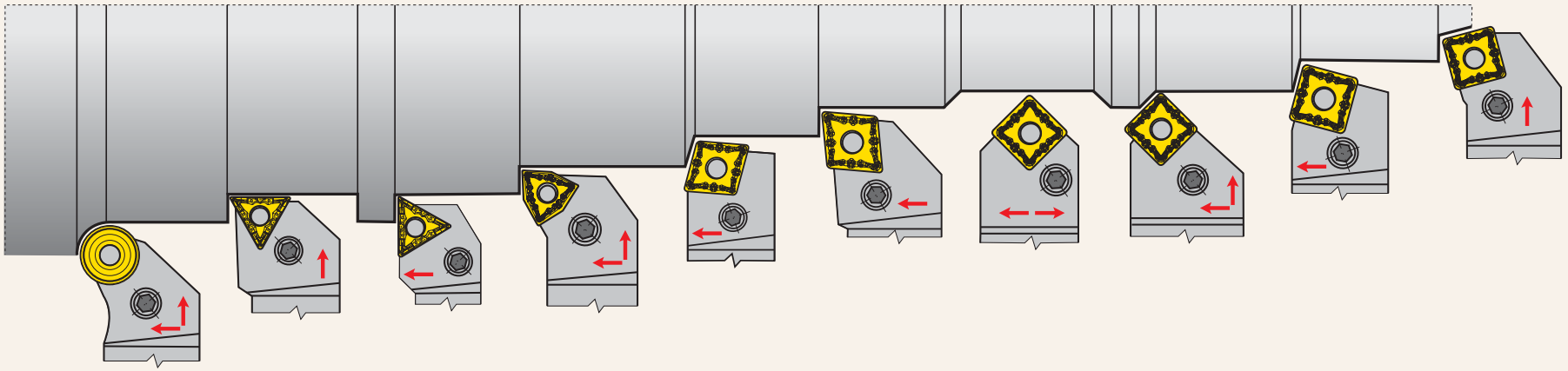
Thus the first step is to assign the workpiece material to one of the (sub)groups - see table 1. below.

Table 1

Group	Subgroup	Subgroup definition	Example ANSII/SAE	Correction to standard	DORMER AMG	VDI 3323
P	P1	Steel and cast steel with very good (enhanced) machinability; automatic steel and low-carbon steel	1213	1.33	1.1, 1.2	1
	P2	Non-alloy and low-alloy cast steel and steel with a medium carbon content (0.25<C<0.55); rigidity of up to 900 MPa and hardness of 160-255 HB	Gr.1043	1.00	1.3	2, 3, 6
	P3	Less machinable non-alloy and low-alloy cast steel and steel with a medium carbon content; rigidity of up to 1000 MPa and hardness of up to 300 HB	Cl. A	.80	1.4	4, 5, 7, 8, (10)
	P4	Medium- to high-alloy cast steel and steel (usually with a carbon content of 0.55 <C); rigidity of up to 1270 MPa and hardness of up to 375HB (resp. 40 HRC)	D3	.60	1.5	9, (10), 11
M	M1	Ferritic corrosion-resistant steel	Type 430	1.09	2.1	12
	M2	Martensitic corrosion-resistant steel	440 C	1.06	(2.1,2.4)	13.1, 13.2
	M3	Austenitic corrosion-resistant steel	Type 321	1.00	2.2	14.1
	M4	Ferritic-austenitic (duplex) and super-austenitic corrosion-resistant steel	EV 12	.93	2.3, 2.4	14.2, 14.3, 14.4
K	K1	Grey cast iron	C1.35B	1.00	3.1, 3.2	15, 16
	K2	Tempered cast iron	Gr.45006	.95	3.1, 3.2	-
	K3	Ductile cast iron ferritic and ferrite-pearlite	Gr.60-40-18	.,90	3.3	17, 19
	K4	Ductile cast iron pearlite-ferritic, pearlite-sorbitic and pearlite	Gr.100-70-03	.85	3.4	18, 20
N	N1	Aluminium and its soft alloys (with a low Si content), particularly formed and cast (non-hardened); hardness of up to 100 HB	A96061	1.00	7.1	21, 22
	N2	Hard Al alloys, particularly cast and hardened (with a high Si content)	A04130	.65	7.2, 7.3, 7.4	23, 24, 25
	N3	Soft Cu alloys, automatic brass and other types of soft brass and bronze	C83600	.60	6.1,6.2, 6.3	26, (27)
	N4	Less machinable and hard Cu alloys	C95200	.40	6.4	(27), 28
S	S1	Technically pure Ti, alloys a , a+b and b, refined and aged alloys	TiAl6V4, AMS R56400	1.75	4.1, 4.2, 4.3	36, 37
	S2	Fe-based alloys	INCOLOY 800, B 163	1.20	(9.1)	31, 32
	S3	Ni-based alloys	INCONEL 718, AMS 5589	1.00	5.1, 5.2, 5.3	33, 34, 35
	S4	Co-based alloys	Haynes 25, AMS 5759	.75	(9.1)	33, 34, 35
H	H1	Highly rigid and hard tool steel and hardened and refined steel with a hardness of 40-50 HRC	T 4	1.15	1.6	38.1
	H2	Hardened and white cast iron 350-600 HV	Gr.1	1.10	-	40.1, 40.2 41.1, 41.2
	H3	Hardened and refined steel with hardness in the 50-55 HRC range	H11	1.00	1.7	38.2
	H4	Hardened and refined (mostly tool) steel with hardness of more than 55 HRC	D3	.95	1.8	39.1, 39.2

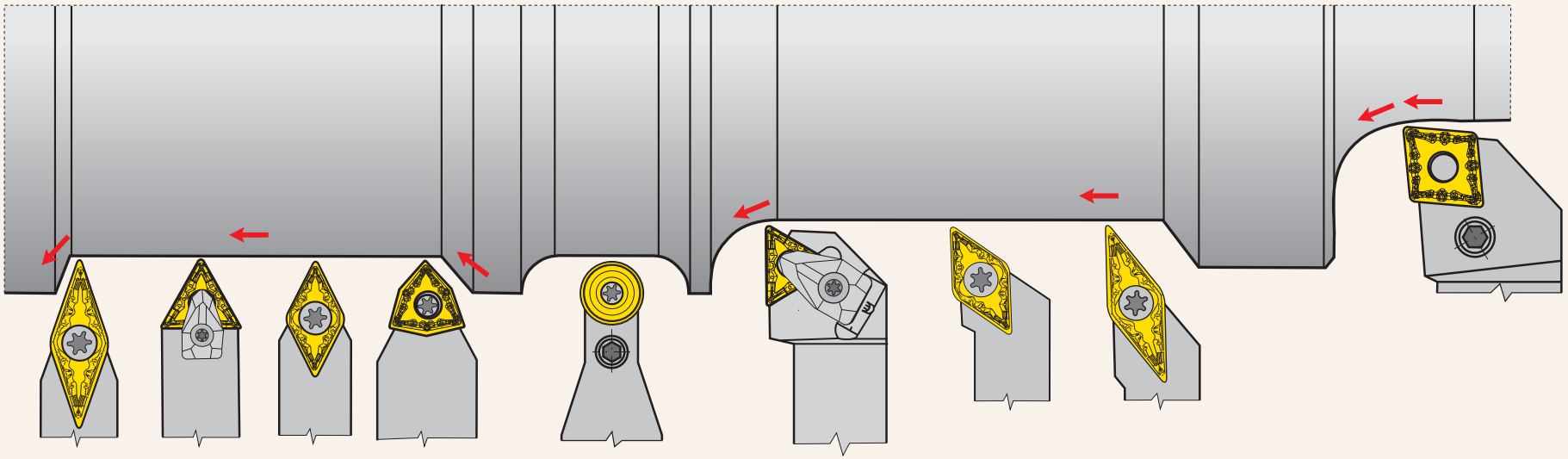
The first step in choosing a turning tool is selecting the type of holder according to technological requirements, possibilities and limitations.
In other words, what surfaces and under what conditions you want to use this tool for turning. For the initial selection of the tool bit type, you can use the navigator at the beginning of the catalogue Turning or one of the following five images.

LONGITUDINAL AND FACE TURNING - EXTERNAL



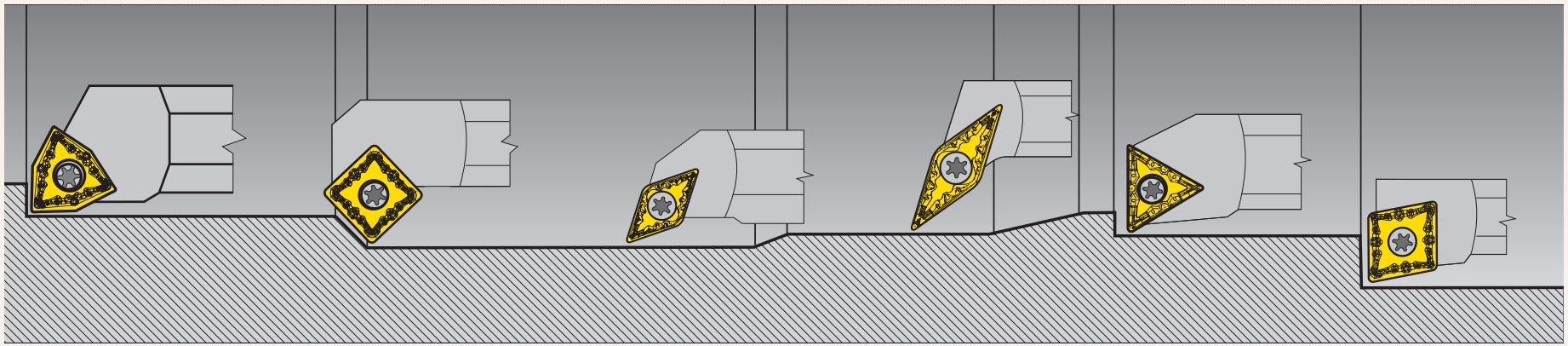
RNMG RCMX RCMT RCMW	TNMG TNMM TNMA TCMT TCMW	WNMG WNMM WNMA WCMT WCMW	CNMG CNMM CNMA CCMT CCMW	SNMG SNMM SNMA SCMT SCMW

COPY TURNING - EXTERNAL



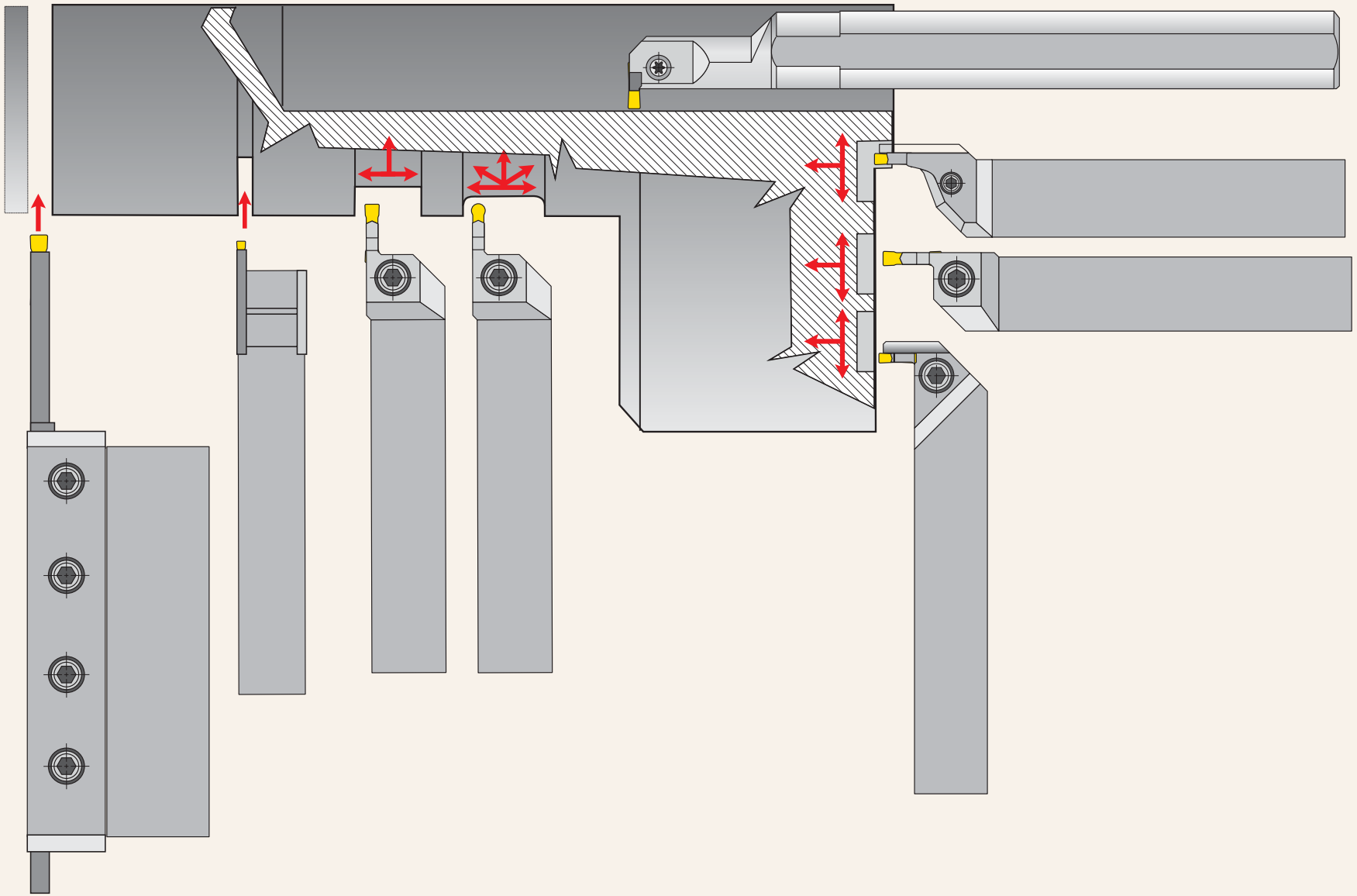
VBMT VCMT VCMW	TNMG TNMM TNMA TCMT TCMW	DNMG DNMM DNMA DCMT DCMW	WNMG WNMM WNMA WCMT WCMW	RNMG RPGA RCMX RCMT RCMW	TNMG TNMM TNMA TCMT TCMW	DNMG DNMM DNMA DCMT DCMW	VBMT VCMT VCMW	CNMG CNMM CNMA CCMT CCMW

BORING COPY TURNING - INTERNAL

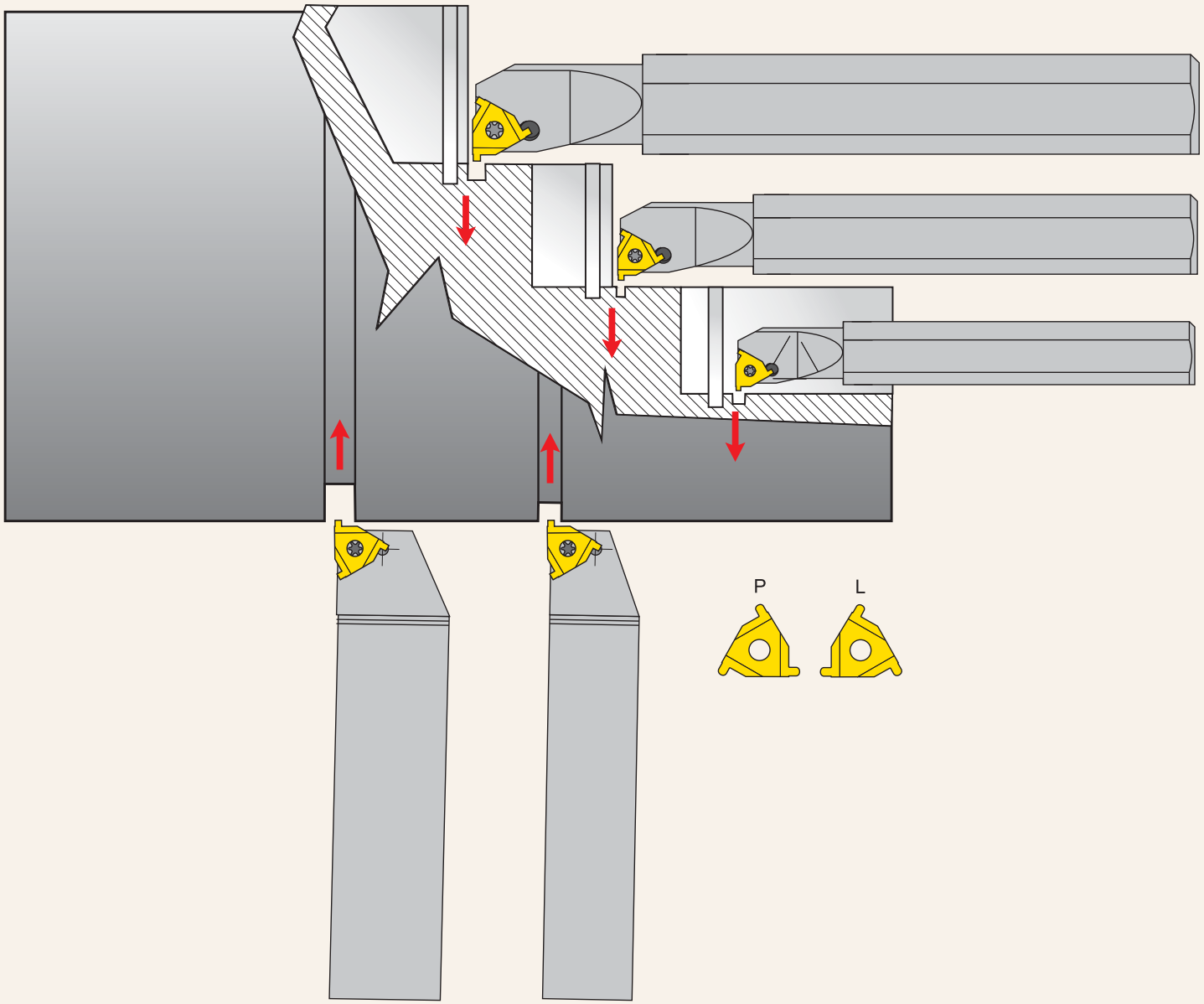


WNMG WNMM WNMA WCMT WCMW	SNMG SNMM SNMA SCMT SCMW	DNMG DNMM DNMA DCMT DCMW	VBMT VCMT VCMW	TNMG TNMM TNMA TCMT TCMW	CNMG CNMM CNMA CCMT CCMW

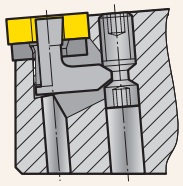
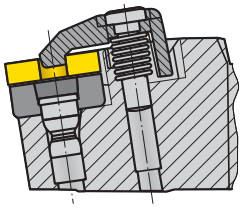
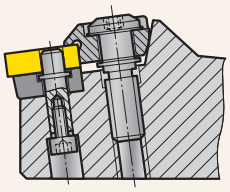
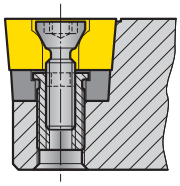
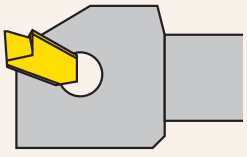
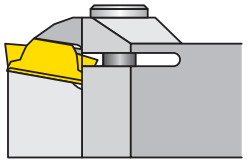
PARTING AND GROOVING - MULTIDIRECTIONAL TURNING



PRECISION AND SHAPE GROOVING



In the second step, which is very closely connected with the first one, choose the clamping system to clamp the insert. Typical characteristics of the different ways of clamping are described in the following text.

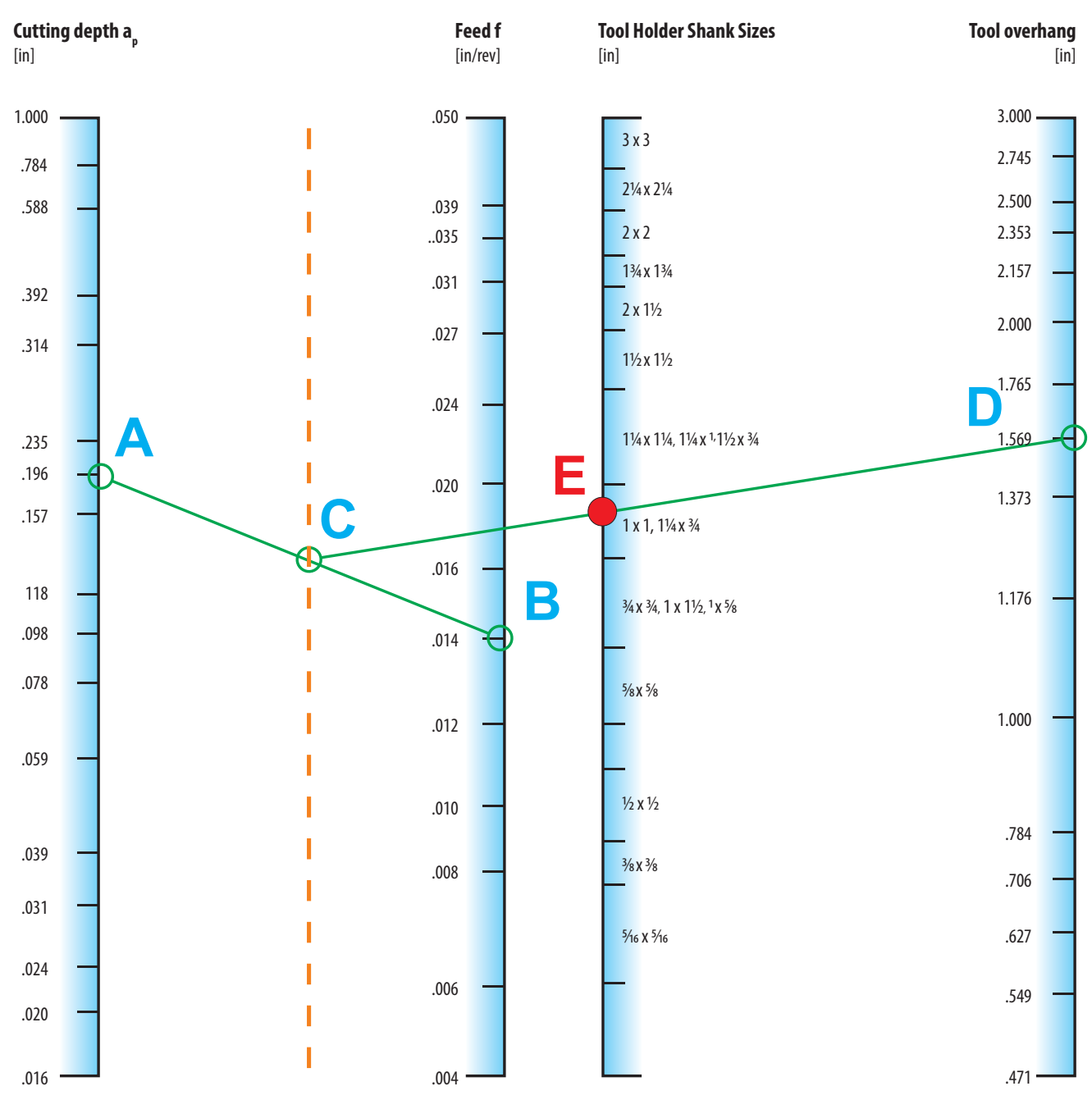
P TYPE		This system is used to clamp negative inserts with cylindrical bore, both with and without a chip breaker. Clamping of the insert is provided by an angle lever which, after tightening the screw, pushes the insert into a seat in the holder. Holders with this system of clamping provide reliable and accurate clamping of inserts. Their best and most common use is for external turning operations, both in finishing and roughing. Alternatively, this method is also used for clamping holders for internal turning of bores of larger diameter.
M TYPE		This way is used to clamp inserts of the same type as in the ISO P system. In this case the insert is mounted on a fixed pin to which it is pushed by a clamp which also fixes the cutting insert from the above. This type of clamping is particularly suitable for holders where increased dynamic stress is expected. These holders are used almost exclusively for external turning.
D TYPE		This way is used to clamp inserts of the same type as in the ISO P system. In this case, the insert is clamped by a special clamp which simultaneously fixes the cutting insert by tightening it in the seat from the above. This type of clamping is particularly suitable for holders where increased dynamic stress is expected. These holders are used almost exclusively for external turning.
S TYPE		This clamping system is encountered especially with turning tools with smaller sections of the body designed for external and internal turning (boring). Clamping in this case is provided by a special screw passing through a conical hole of the insert. By tightening this screw, the insert is fixed in the seat of the tool holder. The benefit of this solution is mainly the fact that there is no obstacle for chip flow.
X TYPE		This designation is used for tools with a special clamping system (i.e. it differs between different manufacturers and equipment suppliers). In our case, the designation identifies tool holders providing the clamping force of the insert by cutting power to the self-locking bed. This type of clamping is used for tools designed for parting and grooving.
G TYPE		This clamping system is used for groove turning and copy turning tools. The insert is pushed into the holder bed by a clamp from the above. The contact surface in the holder, the clamp and the insert is profiled so as to prevent dislodging of the insert by the feed component of the cutting force.

Next task is to perform a selection of, or rather to check, the section of the holder. In selecting the cross-section of the holder, we recommend using the largest possible cross-section of the tool to be clamped in the machine in order to eliminate the risk of vibration. The following nomogram is used to select external steel holders.

Choosing the cross-section of the tool holder

The tool holder shank sizes are normally limited by the turning machine being used. However, when it is possible to make a choice, the nomogram below displays the optimum shank sizes with regard to the cutting conditions (feed and depth of cut) and tool overhang.

Picture 1.



Example of using the nonogram:

First of all, draw a line from the chosen (or maximum) depth of cut a_p (point **A**) to the chosen feed f (point **B**). From the point of intersection of the straight line running down the middle and the line connecting points **A** and **B** (point **C**), draw another line to the point of tool overhang (point **D**). The point on the second axis on the right (point **E**) indicates the optimum tool holder shank sizes.

Choosing the shape and size of the insert

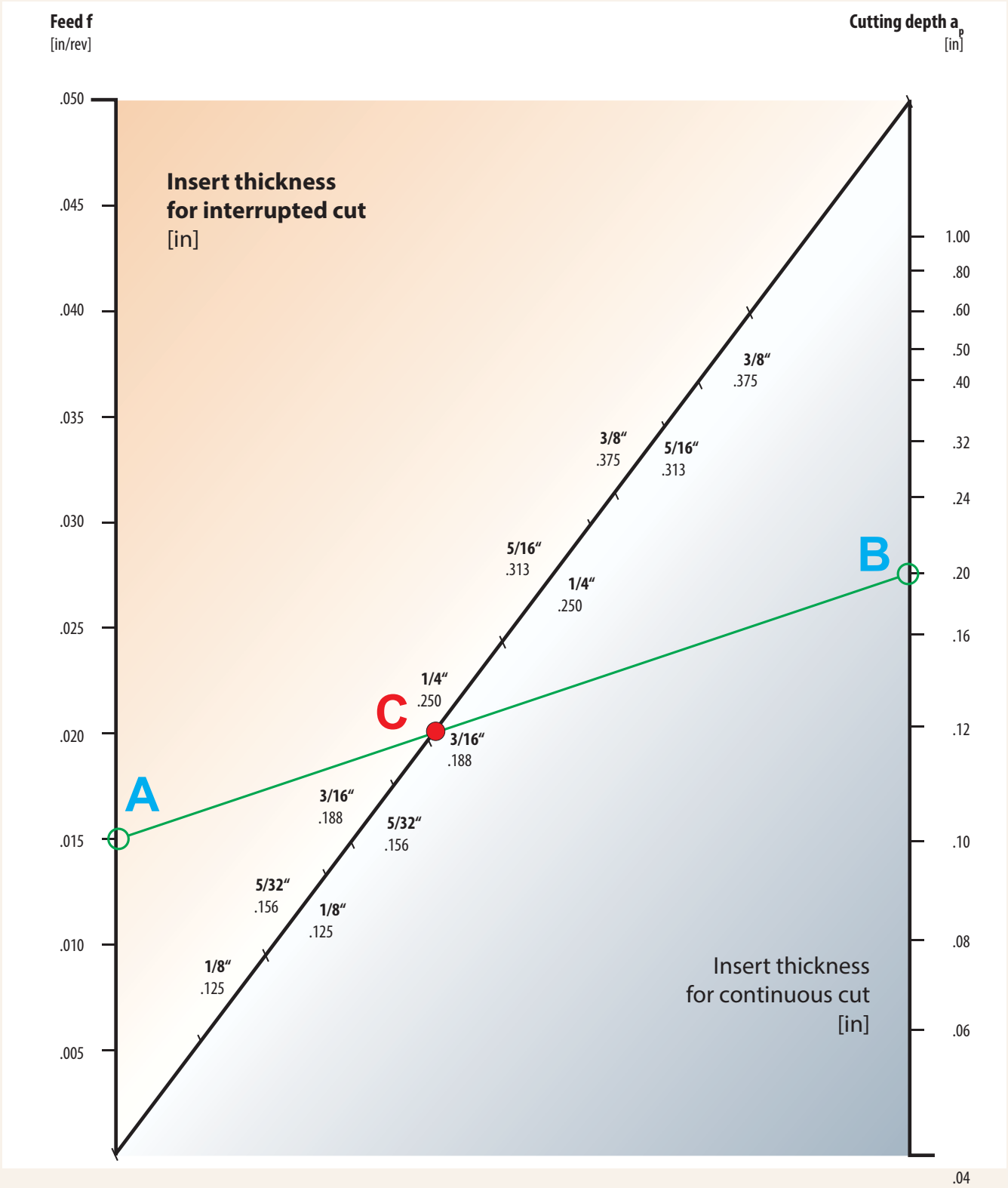
Selecting the insert shape is very closely linked to the insert size and maximum cutting length of that insert. Sometimes there is only one option, but in some cases there are multiple solutions. For example, if we choose a insert cutting edge angle close to 90°, we can choose between insert shapes; V, D, T, W and C. In these cases we recommend following the table below in regards to the percentage of insert cutting engagement as it relates to the shape and size of the insert. It is also important to consider the usable number of cutting edges as an important part of the selection criteria.

Table 2.

Priority of choice	Insert shape		Insert size Code	Insert I. C. size	Maximum length of cutting edge L_{max} [in]		a_{pmax} [in]			
							$\kappa_r = 90°$	$\kappa_r = 75°$ = 105°	$\kappa_r = 60°$ = 120°	$\kappa_r = 45°$ = 135°
Increasing the accessibility of the cutting edge for profiling and fewer vibrations.		**V**	2	1/4"	**0,25L**	.110	.110	.106	.094	-
			3	3/8"		.165	.165	.157	.145	-
		**D**	2	1/4"	**0,25L**	.078	.078	.075	.067	-
			3	3/8"		.114	.114	.110	.098	-
			4	1/2"		.153	.153	.149	.133	-
		**T**	2	1/4"	**0,33L**	.141	.141	-	-	-
			3	3/8"		.216	.216	-	.188	-
			4	1/2"		.286	.286	-	.251	-
			5	5/8"		.357	.357	-	.310	-
		**W**	3	3/8"	**0,50L**	.129	.129	-	-	-
			4	1/2"		.173	.173	-	-	-
		**C**	2	1/4"	**0,66L**	.165	.165	.161	-	-
			3	3/8"		.251	.251	.243	-	-
			4	1/2"		.333	.333	.322	-	-
			5	5/8"		.416	.416	.412	-	-
			6	3/4"		.498	.498	.482	-	-
			8	1"		.647	.647	.627	-	-
		**S**	3	3/8"	**0,66L**	.247	-	.239	-	.176
			4	1/2"		.329	-	.318	-	.235
			5	5/8"		.408	-	.392	-	.278
			6	3/4"		.494	-	.478	-	.349
			8	1"		.659	-	.639	-	.471
		**R**	06	6 mm	**0,40D**	.094	-	-	-	-
			08	8 mm		.125	-	-	-	-
			10	10 mm		.157	-	-	-	-
			12	12 mm		.188	-	-	-	-
			15	15 mm		.235	-	-	-	-
			16	16 mm		.251	-	-	-	-
			19	19 mm		.298	-	-	-	-
			20	20 mm		.314	-	-	-	-
			25	25 mm		.392	-	-	-	-
Increasing the strength of the cutting edge and suitability for interrupted cut.			32	32 mm		.502	-	-	-	-

Choosing the optimum thickness of the insert

To select the insert thickness we can use a simple nomogram as shown below (Picture 2). From the chosen Feed Rate and Cutting Depth we can determine the optimum insert thickness for both continuous and interrupted cutting. The insert thickness is the point of intersection (on the central axis) between the chosen feed rate and the depth of cut. Choose the insert thickness at this point of intersection that is closest to this value (rounded up to the next thickest insert).

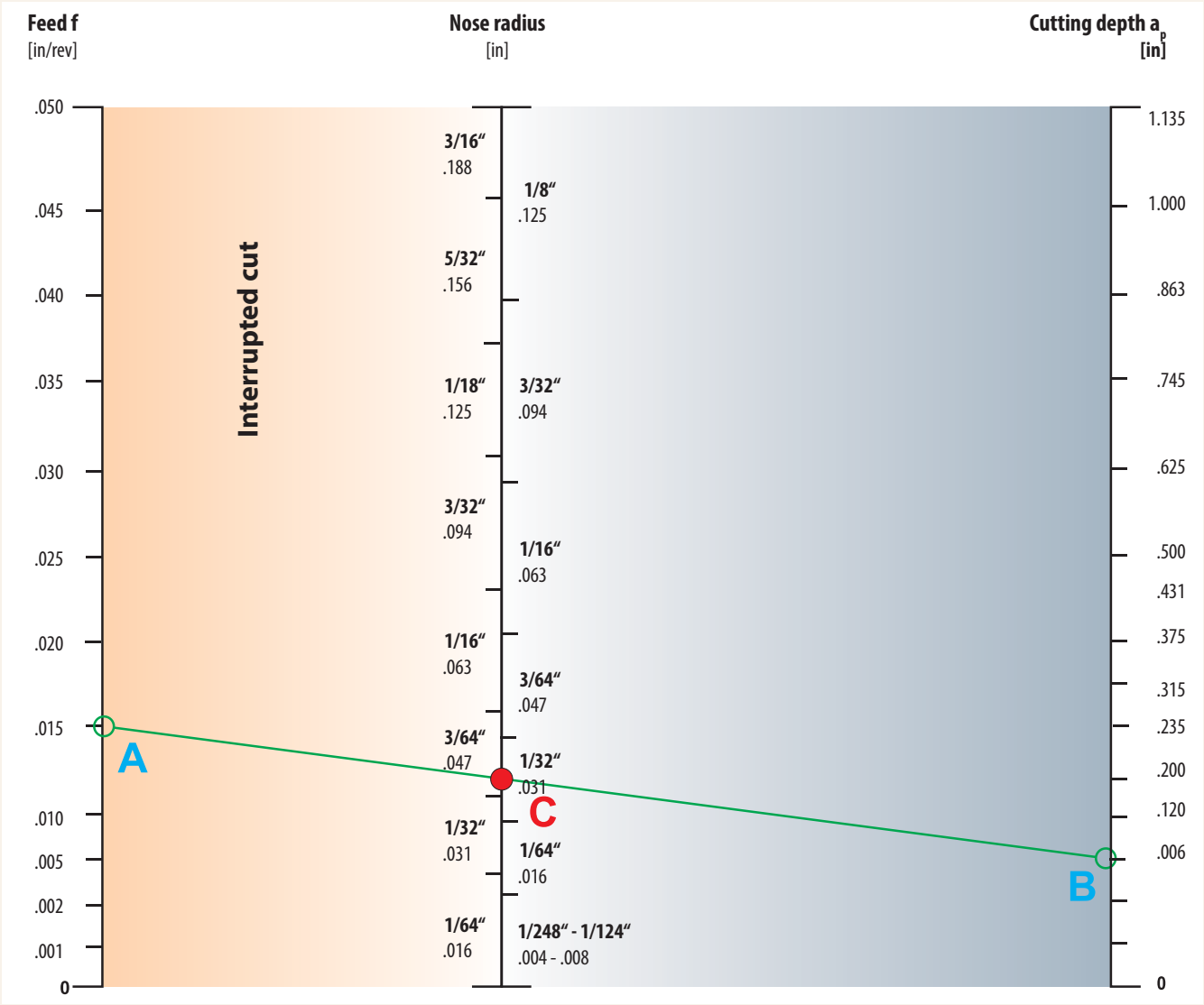


PRAMET

Choosing the nose radius of the insert

The nose radius r_ε (the last two digits in the ISO code and third digit in the ANSI code of the indexable cutting insert) should be as large as possible. The nose radius of the insert, together with the insert shape is what determines the resistance of the cutting edge to plastic deformation. The larger the nose radius r_ε the better the resistance to plastic deformation (damage to the cutting edge due to exceeding the thermal stability limit of the insert grade). A larger r_ε also allows greater feed rates – however, this requires a stable machine-tool workpiece setup. If the conditions are unstable when using a larger nose radius r_ε there is an increased risk of vibrations.

Use the following nomogram to choose the nose radius.



Example of using the nomogram:

The size of the nose radius with respect to interrupted or continuous cutting can be found on the middle axis at the intersection (point **C**) between the selected feed rate to be used (point **A**) and the selected maximum depth of cut a_p (point **B**).

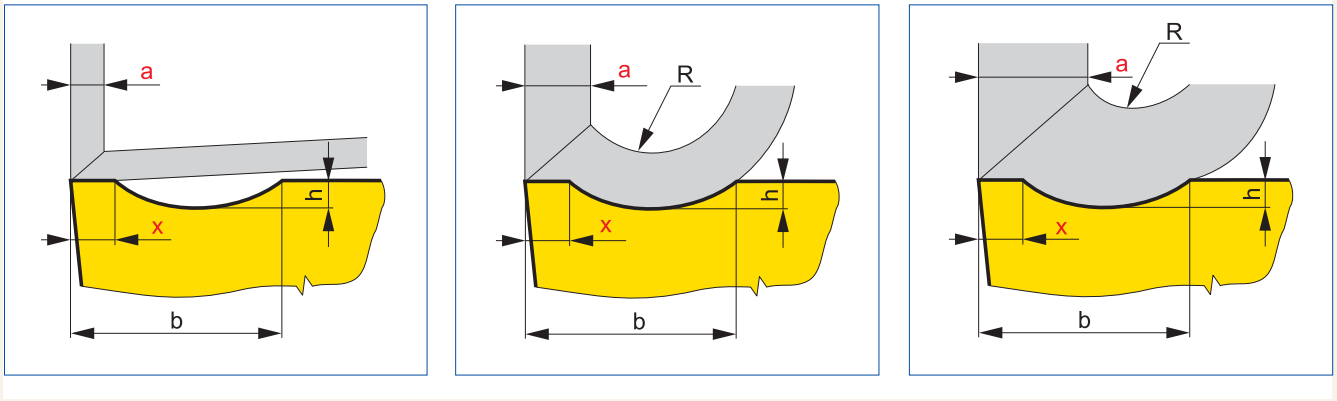
Choosing the chip breaker

The shape of the chip depends on several factors; the properties of the material being machined (the material's strength, toughness and microstructure), the static & dynamic properties of the machine, the properties of the insert grade (frictional properties on the rake face), the coolant used, the geometry of the cutting edge, the cutting conditions and the type of chipbreaker.

All of these factors in the cutting process work in combination to determine the shape of the chip (shearing action, flowing chip or curled chip) which can build up and obstruct the work space in the machining area.

The minimum feed at which the chip breaker functions depends on the width of Top Land „x" and it's angle γ_x. The maximum feed depends on the distance of the outer edge from the cutting edge b and the depth of groove h at the groove chip breaker.

When selecting chipbreaker geometries each chipbreaker only breaks the chip in a defined range of feed and depth of cut. The minimum feed at which the chipbreaker works depends upon the width of the Top Land (x) and it's angle (γ_x). The maximum feed at which the chipbreaker works depends upon the distance from the external edge to the cutting edge (b) and the depth of groove (h) on the chipbreaker.

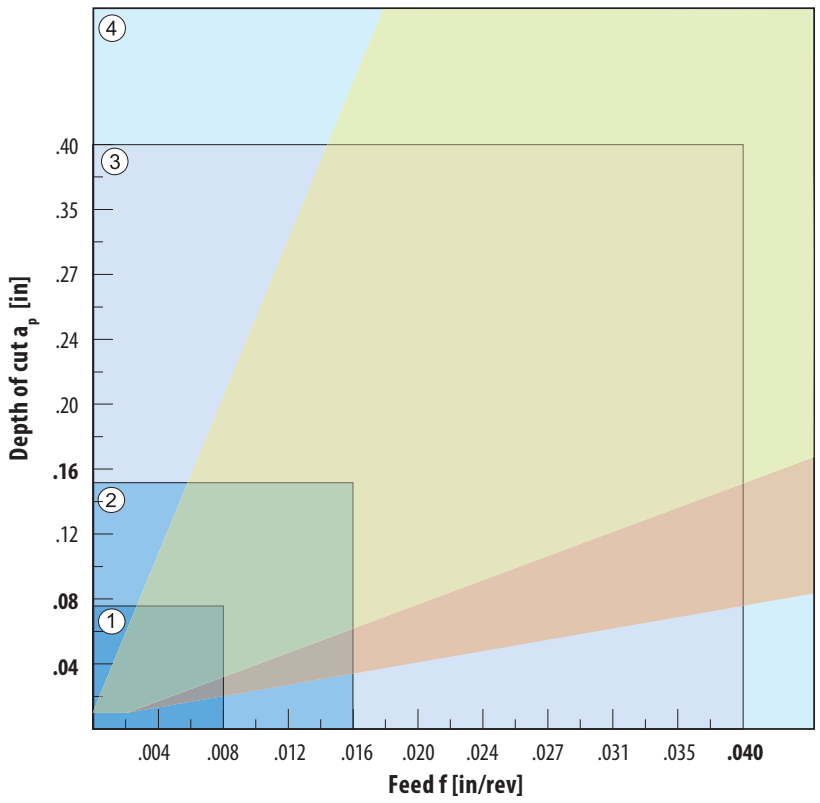


If the chip thickness being cut (at setting angle $\kappa_r = 90°$, equal to the feed) is significantly smaller than the T-land x, the chip is only in contact with the chamfer. It cannot enter the chip breaker and therefore it cannot be broken (see picture).

If the feed f is greater (thickness greater than the depth of a) and $x < a$ (f), the chip enters the chip breaker and is curved at specific values of radius R (see picture).

If the feed f is much greater ($x << a$ (f) - see picture) the chip is excessively deformed (chip is crushed). If the chip misses the chip breaker it will not be broken.

All chip breakers work in a defined range of cutting conditions. This is why the chip breaking area is shown as a continuous range in order to define the most commonly used depth of cut and feed combinations (see following picture). The chip breaker application ranges also overlap.

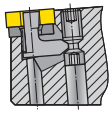
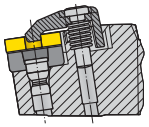
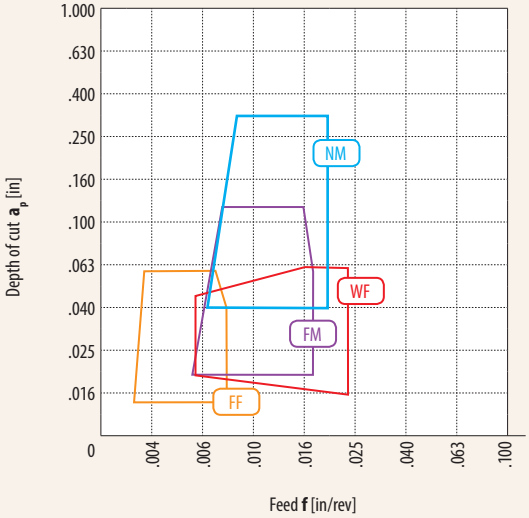
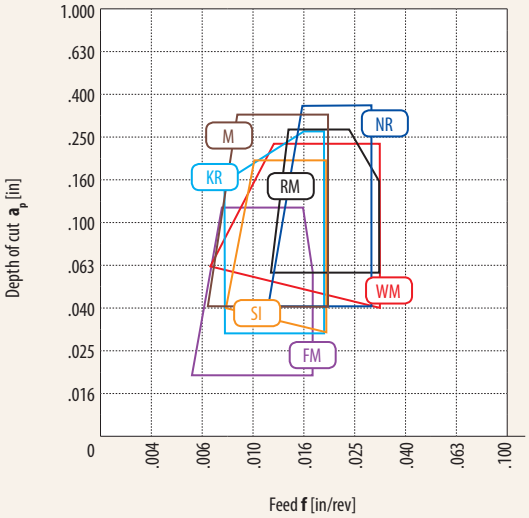
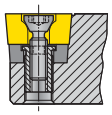
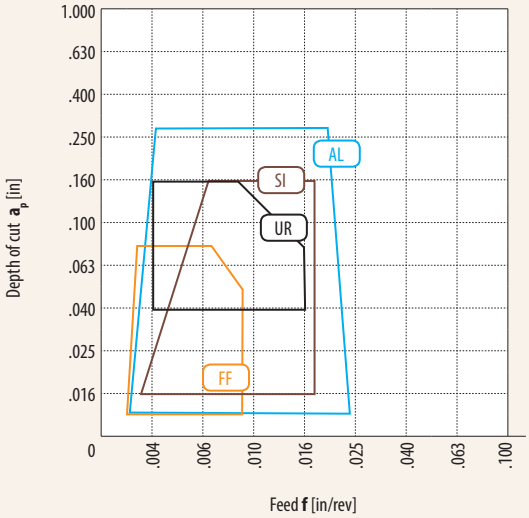
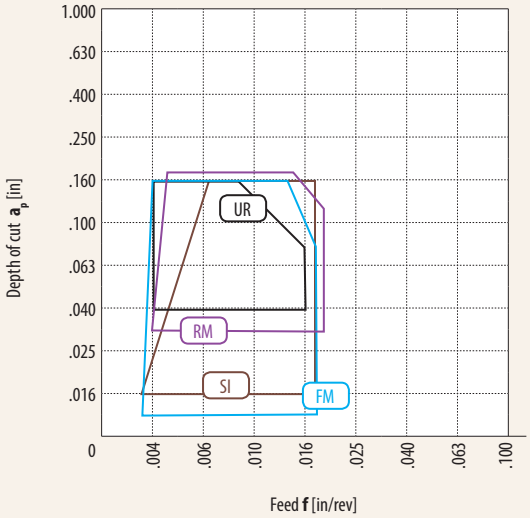


1 Fine turning and finishing
Feed
$f = .002 \div .008$ [in/rev]
Depth of cut
$a_p = .002 \div .08$ [in]

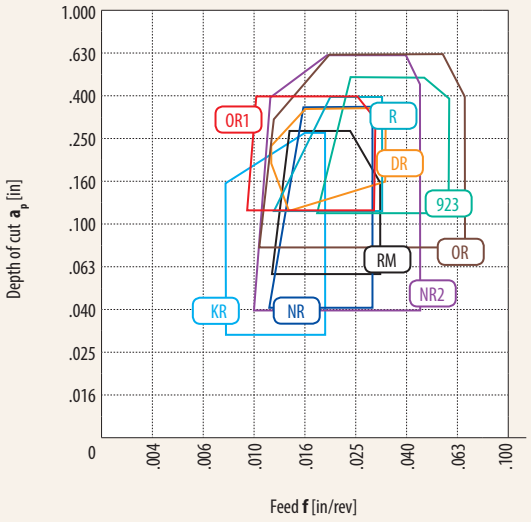
2 Semi-roughing
Feed
$f = .008 \div .016$ [in/rev]
Depth of cut
$a_p = .08 \div .16$ [in]

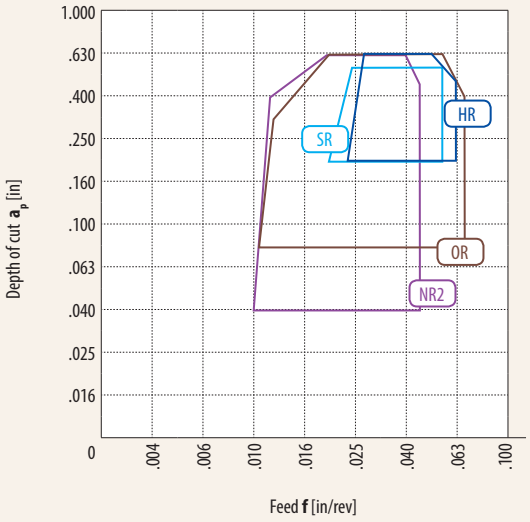
3 Roughing
Feed
$f = .016 \div .04$ [in/rev]
Depth of cut
$a_p = .16 \div .40$ [in]

4 Heavy roughing
Feed
$f = > .04$ [in/rev]
Depth of cut
$a_p = > .40$ [in]

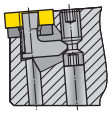
CLAMPING DESIGNATION	FINE TURNING AND FINISHING	SEMI-ROUGHING
P  **D** 		
S 		

ROUGHING	HEAVY ROUGHING	CLAMPING DESIGNATION

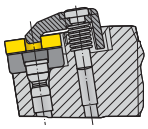


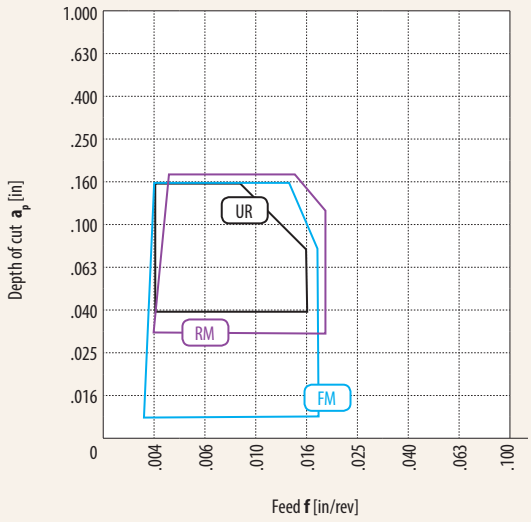


P

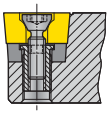


D





S



Overview of turning inserts' geometries

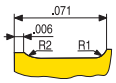
Geometry: **08 (RNMG)**

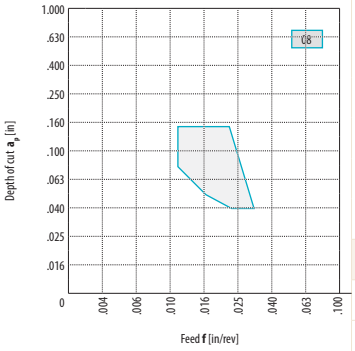
Clamping designation: **P**

Workpiece material group — Turning: P M K N S H

F ■ M ■ □ ■ R ■ □ ■

Profile of cutting edge





Application range

Description

Applied to inserts: RNMG

- Semi-roughing to heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.012 - .032 [in/rev]
a_p	.039 - .158 [in]

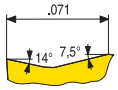
Geometry: **31 (RCMX)**

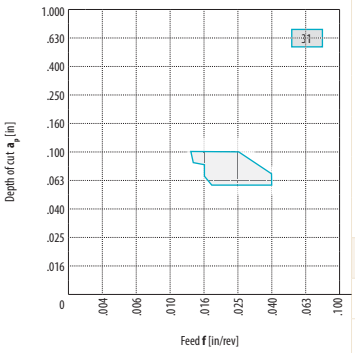
Clamping designation: **P**

Workpiece material group — Turning: P M K N S H

M ■ ◥ ■ R ■ ◥ ■ SR ■ □ ■

Profile of cutting edge





Application range

Description

Applied to inserts: RCMX

- Finishing and semi-roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.016 - .039 [in/rev]
a_p	.059 - .098 [in]

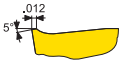
Geometry: **37 (RCMX)**

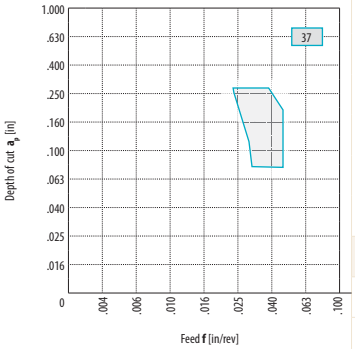
Clamping designation: **P**

Workpiece material group — Turning: P M K N S H

M ■ R ■ □ ■ SR ■ □ ■

Profile of cutting edge





Application range

Description

Applied to inserts: RCMX

- Roughing to heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.024 - .047 [in/rev]
a_p	.079 - .276 [in]

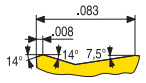
Geometry: **321 (RCMX)**

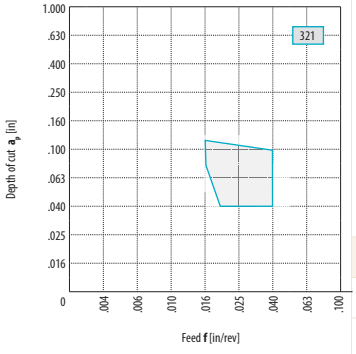
Clamping designation: **P**

Workpiece material group — Turning: P M K N S H

M ■ R ■ □ ■ SR ■ □ ■

Profile of cutting edge





Application range

Description

Applied to inserts: RCMX

- Semi-roughing to heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

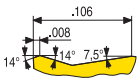
Range of cutting conditions:

f	.016 - .0400 [in/rev]
a_p	.040 - .118 [in]

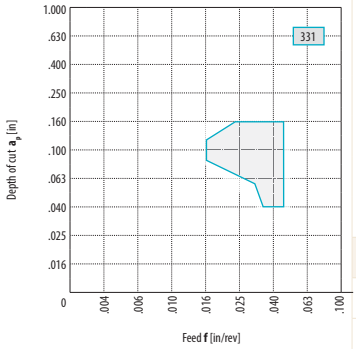
Geometry | Clamping designation: **P** | Workpiece material group: Turning P M K N S H | Application range | Description | Applied to inserts: RCMX

331 (RCMX)

Profile of cutting edge



M	■
R	■ □ ■
SR	■ □ ■



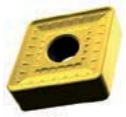
- Semi-roughing to heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

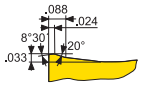
f	.016 - .047 [in/rev]
a_p	.040 - .158 [in]

Geometry | Clamping designation: **P, D** | Workpiece material group: Turning P M K N S H | Application range | Description | Applied to inserts: CNMM, SNMM

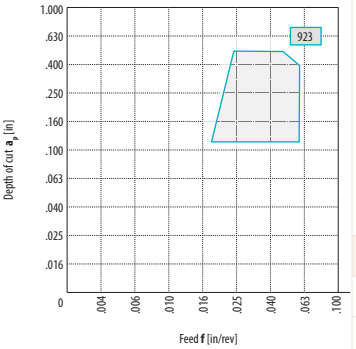
923



Profile of cutting edge



M	■ ◪ ◪
R	■ ◪ ◪
SR	■ ◪ ◪



- Wide-ranging geometry suited to super-roughing and semi-roughing
- Main application - machined materials in group P
- Secondary application - machined materials in groups M and K
- Continuous to heavily interrupted cut

Range of cutting conditions:

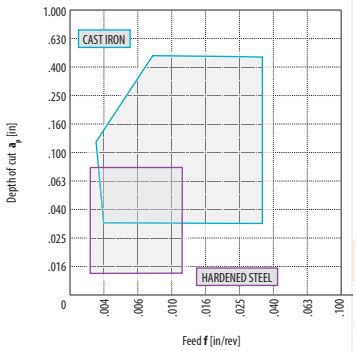
f	.018 - .059 [in/rev]
a_p	.118 - .512 [in]

Geometry | Clamping designation: **P, D** | Workpiece material group: Turning P M K N S H | Application range | Description | Applied to inserts: CNMA, DNMA, SNMA, TNMA, WNMA

...A

Profile of cutting edge

F	■ ■
M	■ ■
R	◪ ◪



- Negative geometry with zero rake suitable for fine finishing, finishing and semi-roughing
- Main application - machined materials in groups K and H
- Continuous and slightly interrupted cut

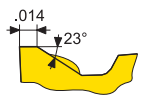
Range of cutting conditions:

f	.004 - .035 [in/rev]
a_p	.032 - .472 [in]

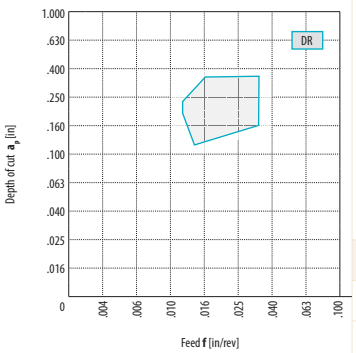
Geometry | Clamping designation: **P (M, D)** | Workpiece material group: Turning P M K N S H | Application range | Description | Applied to inserts: CNMM, DNMM, SNMM, TNMM, WNMM

DR

Profile of cutting edge



F	
M	■ ■ ◪ □
R	■ ■ ◪ □



- Semi-roughing and roughing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

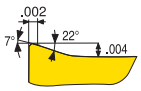
Range of cutting conditions:

f	.012 - .033 [in/rev]
a_p	.098 - .354 [in]

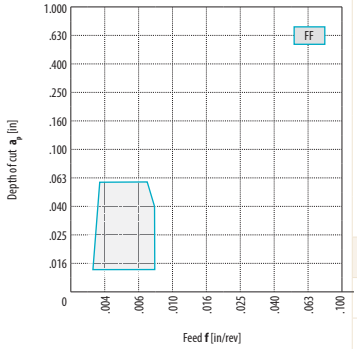
FF

Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
FF	P, D	Turning P M K N S H			CNMG, DNMG, TNMG, VNMG, WNMG

Profile of cutting edge



F ■ ■ ◪ □ □
M
R



- Fine turning and finishing
- Main application - machined materials in group P
- Supplementary application - machined materials in group M
- Continuous cut

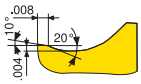
Range of cutting conditions:

f	.002 - .008 [in/rev]
a_p	.012 - .059 [in]

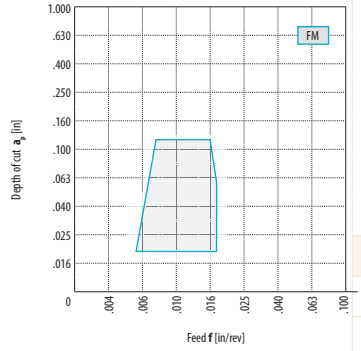
FM

Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
FM	P, D	Turning P M K N S H			CNMG, DNMG, SNMG, TNMG, VNMG, WNMG

Profile of cutting edge



F ■ ■ ◪ □
M ■ ■ ◪ □
R



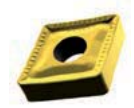
- Finishing to semi-roughing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and moderately interrupted cut

Range of cutting conditions:

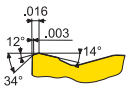
f	.006 - .018 [in/rev]
a_p	.020 - .118 [in]

HR

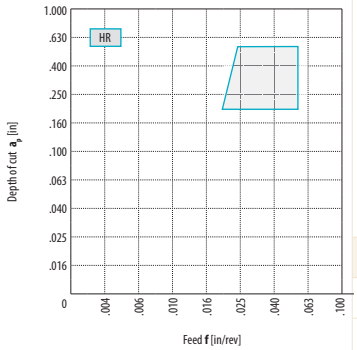
Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
HR	P, M	Turning P M K N S H			CNMM, SNMM, TNMM



Profile of cutting edge



M ■ ◪ ■ □
R ■ ◪ ■ □
SR ■ ◪ ■ □



- Roughing to heavy roughing
- Main application - machined materials in groups P and K
- Secondary application - machined materials in group M
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

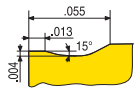
Range of cutting conditions:

f	.020 - .006 [in/rev]
a_p	.197 - .551 [in]

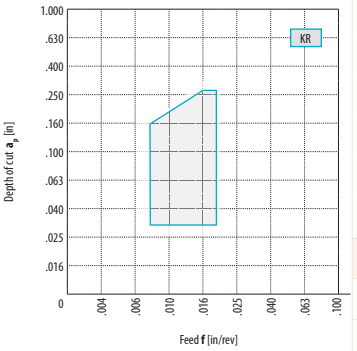
KR

Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
KR	P, D	Turning P M K N S H			CNMG, SNMG, TNMG, WNMG

Profile of cutting edge



F ◪ ◪
M □ ■ ■
R ◪ ■ ◪

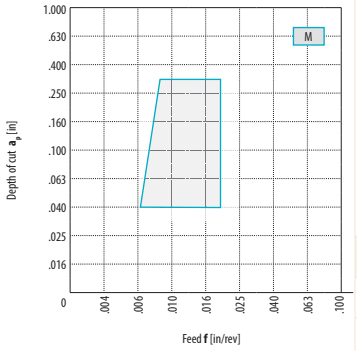


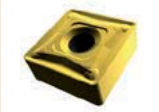
- Semi-roughing and roughing
- Main application - machined materials in groups K and H
- Supplementary application - machined materials in group P
- Continuous and interrupted cut

Range of cutting conditions:

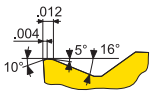
f	.008 - .028 [in/rev]
a_p	.032 - .276 [in]

M

Geometry	Clamping designation	Workpiece material group							Application range	Description	Applied to inserts:
		Turning	P	M	K	N	S	H			
M	P, M,D	F	■	◪	■			□			CNMG, DNMG, SNMG, TNMG, WNMG, VNMG
		M	■	◪	■			□			
		R	■	□	■						



Profile of cutting edge

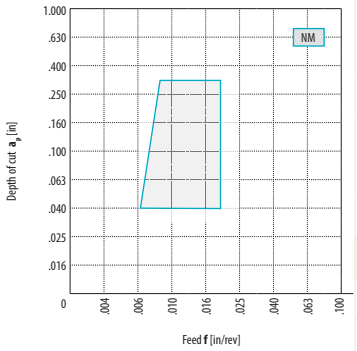


- Finishing and semi-roughing
- Main application - machined materials in groups P and K
- Secondary application - machined materials in group M
- Supplementary application - machined materials in group H
- Continuous cut

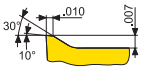
Range of cutting conditions:

f	.007 - .032 [in/rev]
a_p	.039 - .315 [in]

NM

Geometry	Clamping designation	Workpiece material group							Application range	Description	Applied to inserts:
		Turning	P	M	K	N	S	H			
NM	P, D	F	■	■	□	□	■				CNMG, DNMG, TNMG, VNMG, WNMG
		M	■	■	□	□	■				
		R	■	■	□	□	■				

Profile of cutting edge

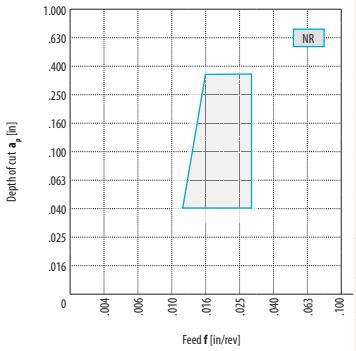


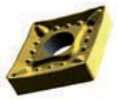
- Double-sided chip breaker not only for fine finishing but also for medium machining and roughing
- Used for machining corrosion-resistant materials and turning common materials such as carbon steels, alloyed steels and super alloys based on Fe, Ni and Co
- Potentially suitable for machining cast iron and non-iron materials

Range of cutting conditions:

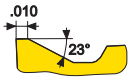
f	.006 - .020 [in/rev]
a_p	.020 - .315 [in]

NR

Geometry	Clamping designation	Workpiece material group							Application range	Description	Applied to inserts:
		Turning	P	M	K	N	S	H			
NR	P, (M, D)	F									CNMM, DNMM, SNMM, TNMM, WNMM
		M	■	■	□	□	■				
		R	◪	■		□	◪				



Profile of cutting edge

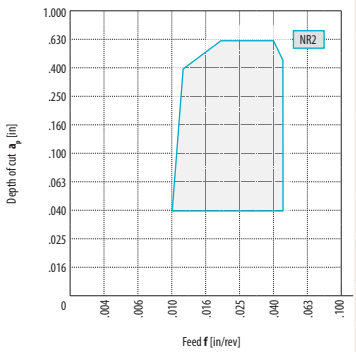


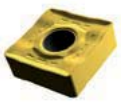
- Semi-roughing and roughing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

Range of cutting conditions:

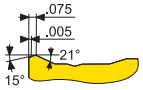
f	.010 - .032 [in/rev]
a_p	.039 - .354 [in]

NR2

Geometry	Clamping designation	Workpiece material group							Application range	Description	Applied to inserts:
		Turning	P	M	K	N	S	H			
NR2	P, (M, D)	M	■	■	◪		□				CNMM, DNMM, SNMM, TNMM, WNMM
		R	■	■	◪		□				
		SR	■	■	◪		□				



Profile of cutting edge



- Versatile turning geometry suitable for heavy roughing and finishing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

Range of cutting conditions:

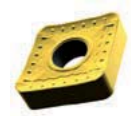
f	.010 - .047 [in/rev]
a_p	.039 - .630 [in]

OR

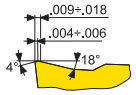
Geometry: Clamping designation **P, (M, D)**

Workpiece material group — Turning: P M K N S H

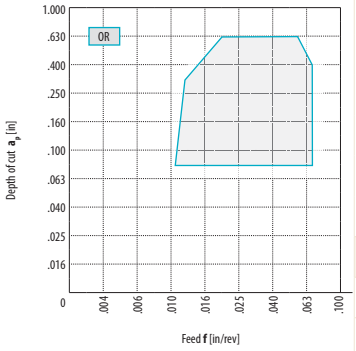
	P	M	K	N	S	H
M	■	■	◪		□	
R	■	■	◪		□	
SR	■	■	◪		□	



Profile of cutting edge



Application range



Description

Applied to inserts: CNMM, DNMM, SNMM, TNMM, WNMM, SCMT

- Versatile turning geometry suitable for heavy roughing and finishing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

Range of cutting conditions:

f	.010 - .067[in/rev]
a_p	.079 - .630 [in]

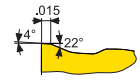
OR1

Geometry: Clamping designation **P, D**

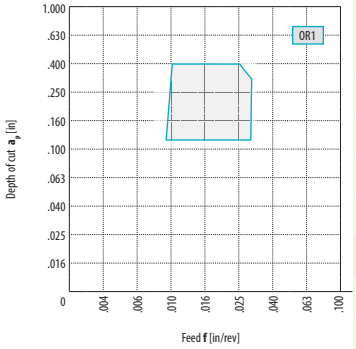
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
M	■	■	◪		□	
R	■	■	◪		□	
SR	■	■	◪		□	

Profile of cutting edge



Application range



Description

Applied to inserts: CNMM, SNMM

- Suitable for semi-roughing, roughing and heavy roughing
- Main application - machined materials in groups P and M
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group S
- Continuous and interrupted cut

Range of cutting conditions:

f	.015 - .047 [in/rev]
a_p	.118 - .394 [in]

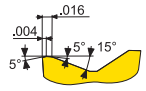
R

Geometry: Clamping designation **P, D**

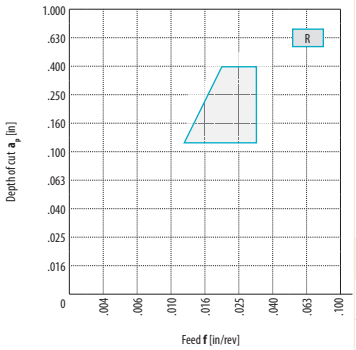
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F						□
M	■	◪	■			□
R	■	◪	■			

Profile of cutting edge



Application range



Description

Applied to inserts: CNMG, DNMG, SNMG, TNMG, WNMG

- Semi-roughing and roughing
- Main application - machined materials in groups P and K
- Secondary application - machined materials in group M
- Supplementary application - machined materials in group H
- Continuous and interrupted cut

Range of cutting conditions:

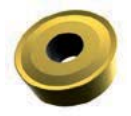
f	.012 - .032 [in/rev]
a_p	.118 - .394 [in]

RF1 (RCMX)

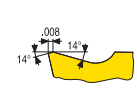
Geometry: Clamping designation **P**

Workpiece material group — Turning: P M K N S H

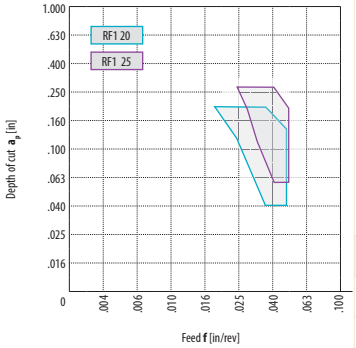
	P	M	K	N	S	H
F	■	□	■			
M	■	□	■			
R						



Profile of cutting edge



Application range



Description

Applied to inserts: RCMX 20, RCMX 25

- Chip breaker designed for machining new railway wheels
- Positive cutting geometry with a narrow negative peripheral chamfered edge
- Finishing to semi-roughing turning
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

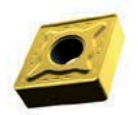
f	.018 (.0236) - .047 (.049) [in/rev]
a_p	.039 (.059) - .197 (.276) [in]

RM

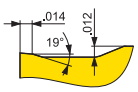
Geometry: Clamping designation **P, D**

Workpiece material group — Turning: P M K N S H

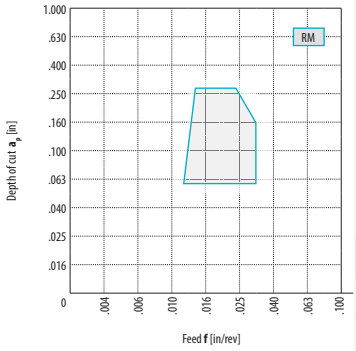
	P	M	K	N	S	H
M		■	■		◪	□
R	■	■	■		◪	□
SR	■	■	■		◪	□



Profile of cutting edge



Application range



Description

Applied to inserts: CNMG. DNMG, SNMG, TNMG, WNMG

- Semi-roughing and roughing
- Main application - machined materials in groups P, M, and K
- Secondary application - machined materials in group S
- Supplementary application - machined materials in group H
- Continuous and interrupted cut

Range of cutting conditions:

f	.012 - .032 [in/rev]
a_p	.059 - .276 [in]

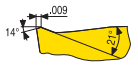
RM1 (RCMX)

Geometry: Clamping designation **P**

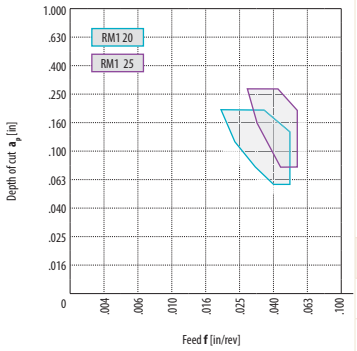
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F	■	□	■			
M	■	□	■			
R						

Profile of cutting edge



Application range



Description

Applied to inserts: RCMX 20, RCMX 25

- Chip breaker designed for machining new railway wheels
- Positive cutting geometry with a narrow negative peripheral chamfered edge
- Specific chip breaker ensures reduced contact between the chip and the face
- Finishing to semi-roughing turning
- Main application - machined materials in groups P and K; supplementary application
- Machined materials in group M - continuous and interrupted cut

Range of cutting conditions:

f	.020 (.028) - .051 (.006) [in/rev]
a_p	.059 (.079) - .197 (.276) [in]

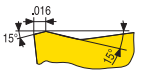
RM2 (RCM.)

Geometry: Clamping designation **P**

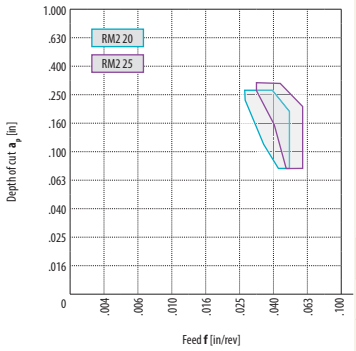
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F						
M	■	□	■			
R	■	□	■			

Profile of cutting edge



Application range



Description

Applied to inserts: RCMX 25, RCMX 32, RCMH 32

- The first choice for machining new railway wheels
- Positive cutting geometry with a medium negative peripheral chamfered edge
- Semi-roughing to roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.028 (.032) - .051 (.059) [in/rev]
a_p	.079 - .276 (.315) [in]

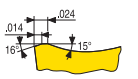
RR2 (RCM.)

Geometry: Clamping designation **P**

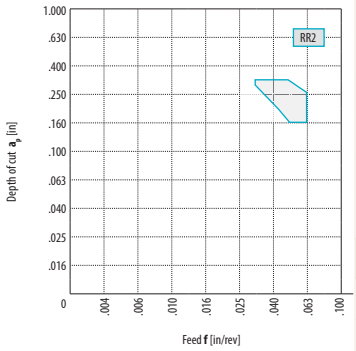
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
M						
R	■	□	■			
SR	■	□	■			

Profile of cutting edge



Application range



Description

Applied to inserts: RCMX 32, RCMH 32

- Chip breaker designed for machining new railway wheels
- Positive cutting geometry with a wide negative peripheral chamfered edge
- Roughing chip breaker for heavy cuts with casting and forging skin
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

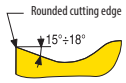
Range of cutting conditions:

f	.032 - .063 [in/rev]
a_p	.158 - .315 [in]

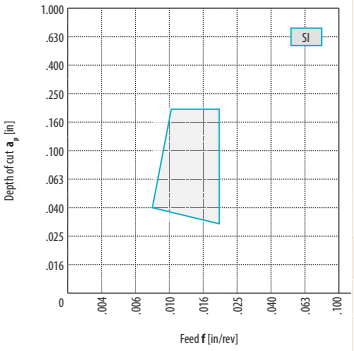
SI

Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
SI	P, D	Turning: P M K N S H	SI	- (fine) finishing and semi-roughing - Main application - machined materials in groups P, M and K - Supplementary application - machined materials in groups K and N - Continuous cut	CNMG, DNMG, TNMG, WNMG

Profile of cutting edge



Turning	P	M	K	N	S	H
F	■	■	□	□	■	
M	■	■	□	□	■	
R						

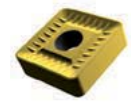


Range of cutting conditions:

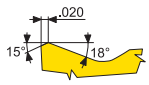
f	.008 - .020 [in/rev]
a_p	.032 - .197 [in]

SR

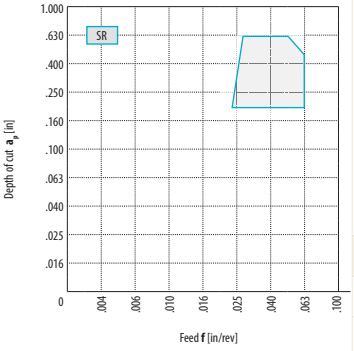
Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
SR	P	Turning: P M K N S H	SR	- Heavy roughing - Main application - machined materials in groups P, M, and K - Stable negative peripheral top land - Continuous and interrupted cut	SNMM



Profile of cutting edge



Turning	P	M	K	N	S	H
M						
R	■	■	■			
SR	■	■	■			

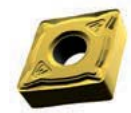


Range of cutting conditions:

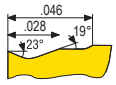
f	.028 - .063 [in/rev]
a_p	.197 - .630 [in]

WF

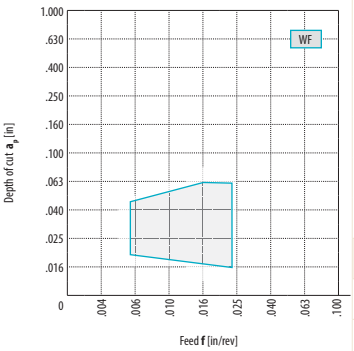
Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
WF	P, D	Turning: P M K N S H	WF	- Fine turning and finishing - Wiper geometry for highly productive turning - Main application - machined materials in groups P and K - Continuous cut	CNMG, WNMG



Profile of cutting edge



Turning	P	M	K	N	S	H
F	■		■			
M	■		■			
R						



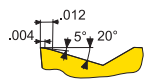
Range of cutting conditions:

f	.006 - .024 [in/rev]
a_p	.016 - .063 [in]

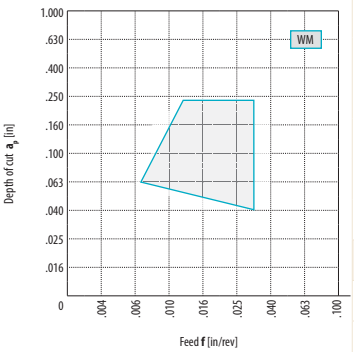
WM

Geometry	Clamping designation	Workpiece material group	Application range	Description	Applied to inserts:
WM	P, D	Turning: P M K N S H	WM	- Semi-roughing and roughing - Wiper geometry for highly productive turning - Main application - machined materials in groups P and K - Continuous and moderately interrupted cut	CNMG, WNMG

Profile of cutting edge



Turning	P	M	K	N	S	H
F	■		■			
M	■		■			
R	■		■			



Range of cutting conditions:

f	.007 - .032 [in/rev]
a_p	.039 - .236 [in]

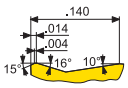
371 (RCMT)

Geometry: S — Clamping designation: S

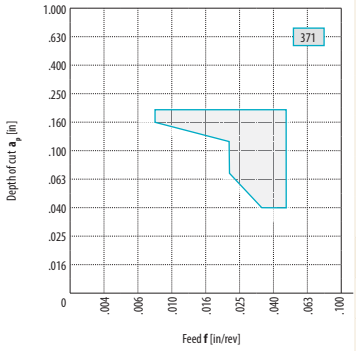
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
M						
R	■	□	■			
SR	■	□	■			

Profile of cutting edge



Application range



Description

Applied to inserts: RCMT

- Semi-roughing and heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.008 - .047 [in/rev]
a_p	.039 - .197 [in]

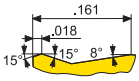
372 (RCMT)

Geometry: S — Clamping designation: S

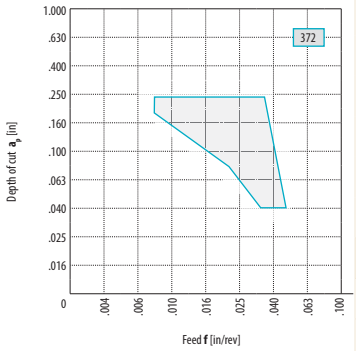
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
M						
R	■	□	■			
SR	■	□	■			

Profile of cutting edge



Application range



Description

Applied to inserts: RCMT

- Semi-roughing and heavy roughing
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

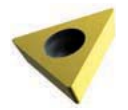
f	.008 - .047 [in/rev]
a_p	.039 - .236 [in]

...W

Geometry: S — Clamping designation: S

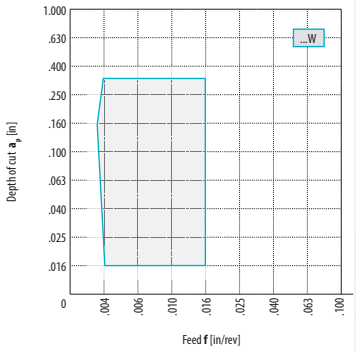
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F			■			■
M			■			■
R			◪			◪



Profile of cutting edge

Application range



Description

Applied to inserts: CCMW, DCMW, SCMW, RCMW, TCMW, VCMW

- Negative geometry with zero rake suitable for fine finishing and semi-roughing
- Main application - machined materials in groups K and H
- Continuous and moderately interrupted cut

Range of cutting conditions:

f	.004 - .016 [in/rev]
a_p	.016 - .331 [in]

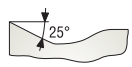
AL

Geometry: S — Clamping designation: S

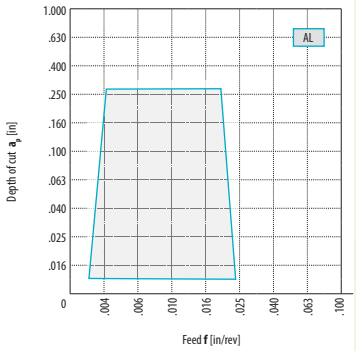
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F				■		
M				■		
R				■		

Profile of cutting edge



Application range



Description

Applied to inserts: CCGT, DCGT, SCGT, RCGT, TCGT, VCGT, WCGT

- High positive turning geometry with sharp cutting edge
- Fine turning to roughing of AL and AL alloys
- Main application - machined materials in group N
- Continuous cut

Range of cutting conditions:

f	.002 - .024 [in/rev]
a_p	.008 - .276 [in]

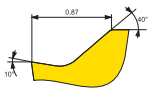
FF

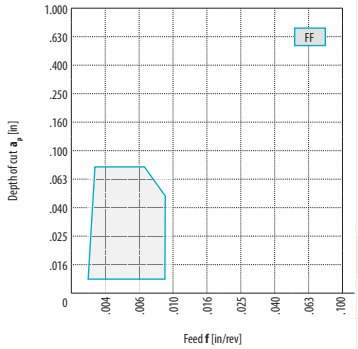
Geometry: **S** | Clamping designation: **S**

Workpiece material group — Turning: P M K N S H

F: ■ ■ ◪ □ □
M:
R:

Profile of cutting edge





Application range

Description

Applied to inserts: CCMT, DCMT

- Fine and finishing turning
- Main application - P and M
- Secondary application - K
- Supplementary application - N and S
- Continuous cut

Range of cutting conditions:

f	.002 - .009 [in/rev]
a_p	.008 - .079 [in]

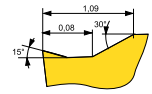
FM

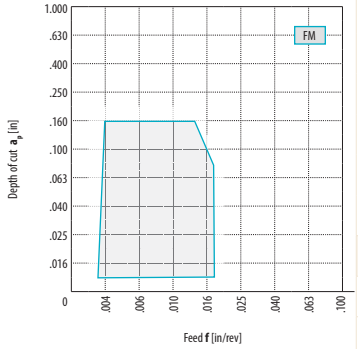
Geometry: **S** | Clamping designation: **S**

Workpiece material group — Turning: P M K N S H

F: ■ ■ ◪ □
M: ■ ■ ◪ □
R:

Profile of cutting edge





Application range

Description

Applied to inserts: CCMT, DCMT, SCMT, TCMT, VBMT, WCMT

- Finishing and semi-roughing, drilling
- Main application - P and M
- Secondary application - K
- Potential application - S
- Continuous and slightly interrupted cut

Range of cutting conditions:

f	.003 - .018 [in/rev]
a_p	.008 - .158 [in]

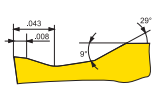
FM (RCMT)

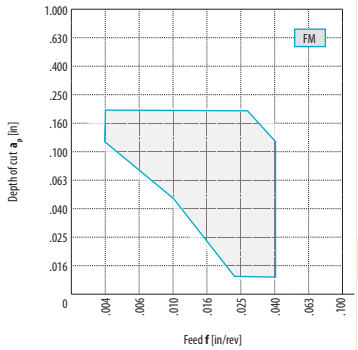
Geometry: **S** | Clamping designation: **S**

Workpiece material group — Turning: P M K N S H

F: ■ ■ ◪ □
M: ■ ■ ◪ □
R:

Profile of cutting edge





Application range

Description

Applied to inserts: RCMT

- Finishing and semi-roughing, drilling
- Main application - P and M
- Secondary application - K
- Supplementary application - S
- Continuous and interrupted cut

Range of cutting conditions:

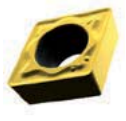
f	.004 - .039 [in/rev]
a_p	.012 - .189 [in]

RM

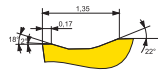
Geometry: **S** | Clamping designation: **S**

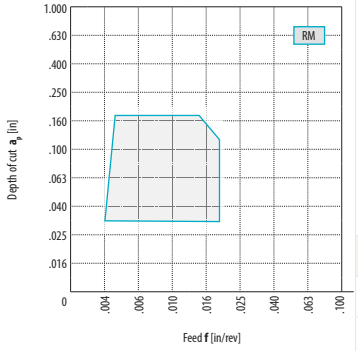
Workpiece material group — Turning: P M K N S H

F:
M: ■ ■ ■ ◪ □
R: ■ ■ ■ ◪ □



Profile of cutting edge





Application range

Description

Applied to inserts: CCMT, DCMT, SCMT, TCMT, VBMT

- Semi-roughing, drilling
- Main application - P, M, and K
- Secondary application - S
- Supplementary application - H
- Continuous and interrupted cut

Range of cutting conditions:

f	.004 - .020 [in/rev]
a_p	.032 - .177 [in]

SI

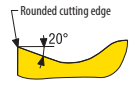
Geometry: S

Clamping designation: S

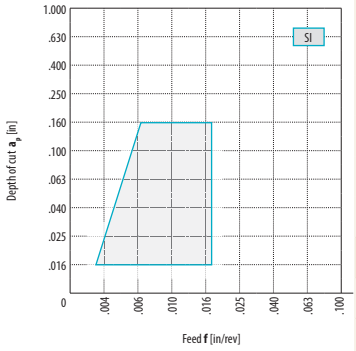
Workpiece material group — Turning: P M K N S H

	P	M	K	N	S	H
F	■	■	◪	□	■	
M	■	■	◪	□	■	
R						

Profile of cutting edge



Application range



Description

Applied to inserts: CCGT, TCGT

- Universal turning geometry characterized by a low cutting force
- Finishing and semi-roughing, drilling
- Main application - machined materials in groups P, M, and S
- Secondary application - machined materials in group K
- Supplementary application - machined materials in group N
- Continuous cut

Range of cutting conditions:

f	.003 - .018 [in/rev]
a_p	.016 - .158 [in]

UR (RCMT)

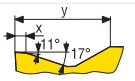
Geometry: S

Clamping designation: S

Workpiece material group — Turning: P M K N S H

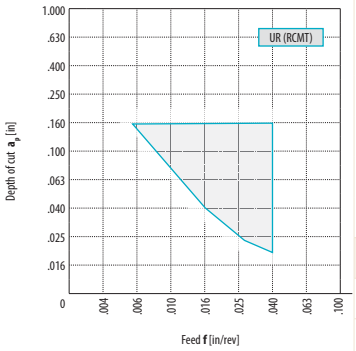
	P	M	K	N	S	H
M	■	□	■			
R	■	□	■			
SR						

Profile of cutting edge



	x	y
06	0,00	.0354
08	.0031	.03946
10	0,18	.0512
12	0,11	.05915

Application range



Description

Applied to inserts: RCMT

- Fine turning and finishing, drilling
- Main application - machined materials in groups P and K
- Supplementary application - machined materials in group M
- Continuous and interrupted cut

Range of cutting conditions:

f	.006 - .039 [in/rev]
a_p	.020 - .197 [in]

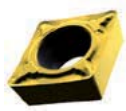
UR

Geometry: S

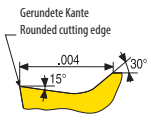
Clamping designation: S

Workpiece material group — Turning: P M K N S H

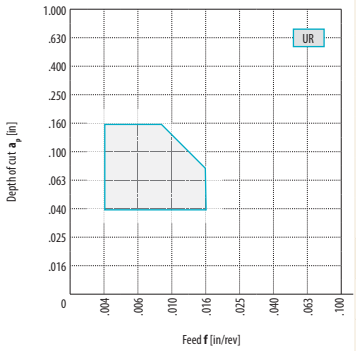
	P	M	K	N	S	H
F	■	■	■	□		
M	■	■	■	□		
R						



Profile of cutting edge



Application range



Description

Applied to inserts: CCMT, DCMT, RCMT, SCMT, TCMT, VBMT, WCMT

- Fine turning and finishing, drilling
- Main application - machined materials in groups P, M, and K
- Supplementary application - machined materials in group N
- Continuous and interrupted cut

Range of cutting conditions:

f	.004 - .016 [in/rev]
a_p	.039 - .158 [in]

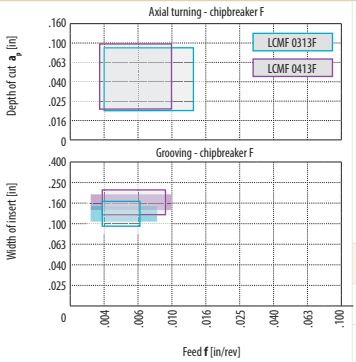
13 F (LCM.)

Geometry: Clamping designation **G**

Workpiece material group — Turning: P M K N S H

F: ■ ◪ ■ | M: ■ ◪ ■ | R:

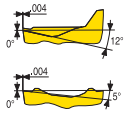
Application range



Description

Applied to inserts: LCMF, LCMR

Profile of cutting edge



- Cutting geometry suitable for grooving and axial turning
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

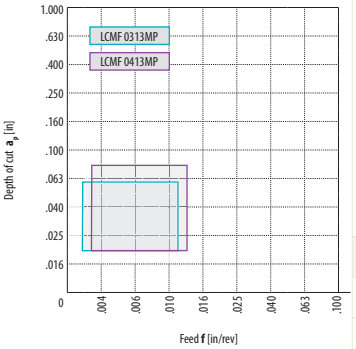
13 MP (LCM.)

Geometry: Clamping designation **G**

Workpiece material group — Turning: P M K N S H

F: ■ ◪ ■ | M: ■ ◪ ■ | R:

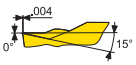
Application range



Description

Applied to inserts: LCMF, LCMR

Profile of cutting edge



- Cutting geometry suitable for copy turning
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

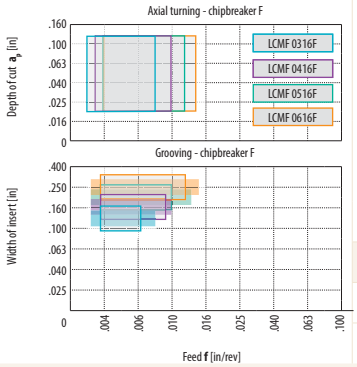
16 F (LCM.)

Geometry: Clamping designation **G**

Workpiece material group — Turning: P M K N S H

F: ■ ◪ ■ | M: ■ ◪ ■ | R:

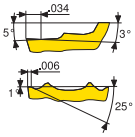
Application range



Description

Applied to inserts: LCMF, LCMR

Profile of cutting edge



- Cutting geometry suitable for grooving and axial turning
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

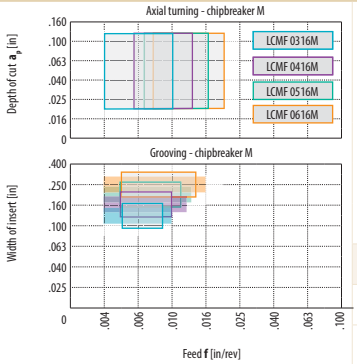
16 M (LCM.)

Geometry: Clamping designation **G**

Workpiece material group — Turning: P M K N S H

F: ■ ◪ ■ | M: ■ ◪ ■ | R:

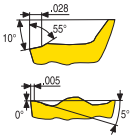
Application range



Description

Applied to inserts: LCMF, LCMR

Profile of cutting edge



- Cutting geometry suitable for axial turning and grooving
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

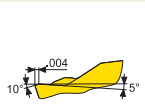
16 MP (LCM.)

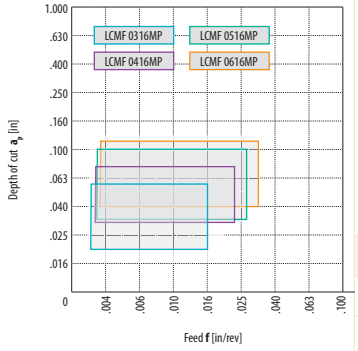
Geometry: G

Clamping designation: G

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts: LCMF, LCMR

- Geometry suitable for copy turning
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

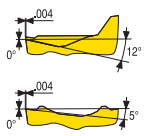
20 F1 (LCMF)

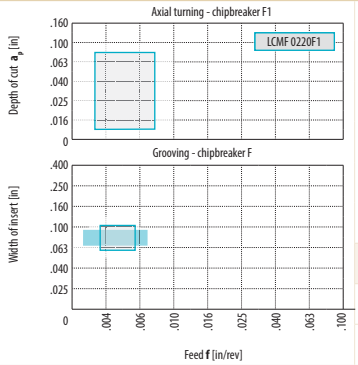
Geometry: G

Clamping designation: G

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts: LCMF

- Cutting geometry suitable for grooving and axial turning
- Geometry suitable for machined material groups P, K, and M
- For fine turning and finishing

Range of cutting conditions:

f	See diagram
a_p	See diagram

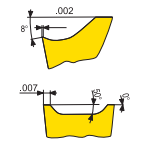
20 M2 (LCMF)

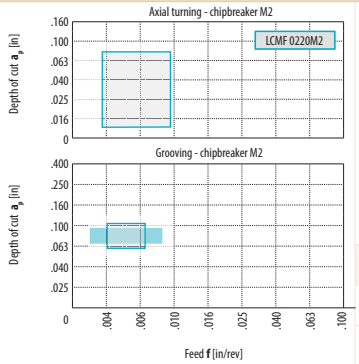
Geometry: G

Clamping designation: G

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts: LCMF

- Extremely universal cutting geometry, generates a very low cutting force and has good stability
- Parting and grooving
- Main application - machined material groups P and M
- Secondary application area - machined material groups K and S
- Supplementary application - machined material groups N and H
- Suitable for slightly interrupted cut

Range of cutting conditions:

f	.004 - .009 [in/rev]
a_p	.012 - .059 [in]

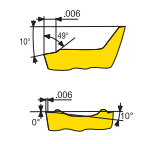
30 F (LCM.)

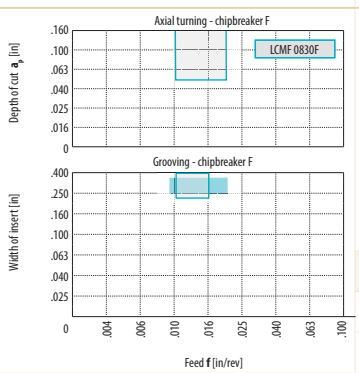
Geometry: G

Clamping designation: G

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts: LCMF, LCMR

- Extremely universal cutting geometry, generates a very low cutting force and has good stability
- Parting and grooving
- Main application - machined material groups P and M
- Secondary application area - machined material groups K and S
- Supplementary application - machined material groups N and H
- Suitable for slightly interrupted cut

Range of cutting conditions:

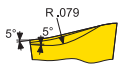
f	.010 - .020 [in/rev]
a_p	.051 - .236 [in]

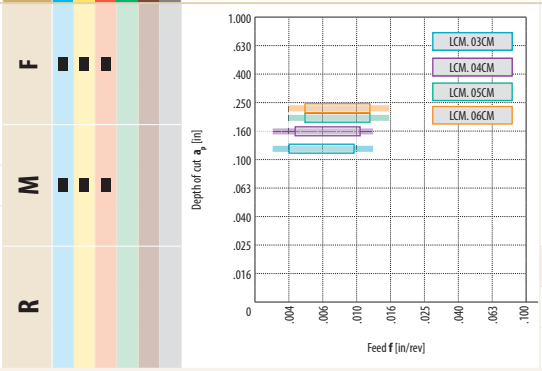
CM (LCM.)

Geometry: Clamping designation **G**

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts:
LCMF 13 CM, LCMF 16 CM, LCMR 16 CM

- Cutting geometry particularly suited to parting and grooving
- Geometry suitable for machined materials in groups P, K, and M

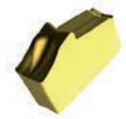
Range of cutting conditions:

f	See diagram
a_p	See diagram

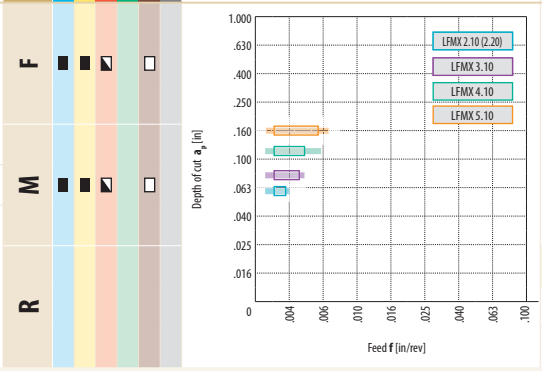
F1 (LFMX)

Geometry: Clamping designation **X**

Workpiece material group — Turning: P M K N S H



Profile of cutting edge



Application range

Description

Applied to inserts:
LFMX

- Universal cutting geometry characterized by a low cutting resistance
- Parting and grooving
- Main application - machined material groups P and M
- Secondary application area - machined materials in group K
- Supplementary application - machined materials in group S

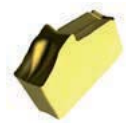
Range of cutting conditions:

f	See diagram
a_p	See diagram

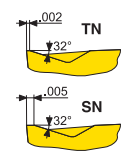
F2 (LFMX)

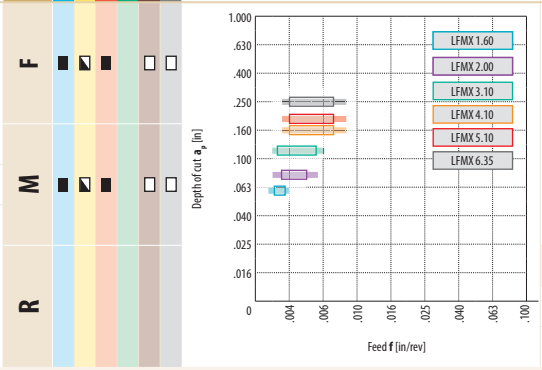
Geometry: Clamping designation **X**

Workpiece material group — Turning: P M K N S H



Profile of cutting edge





Application range

Description

Applied to inserts:
LFMX

- Universal cutting geometry characterized by a low cutting resistance
- Parting and grooving
- Main application - machined material groups P and K
- Secondary application area - machined materials in group M
- Supplementary application - machined materials groups S and H
- Recommended for continuous cut

Range of cutting conditions:

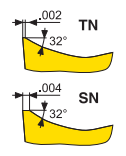
f	See diagram
a_p	See diagram

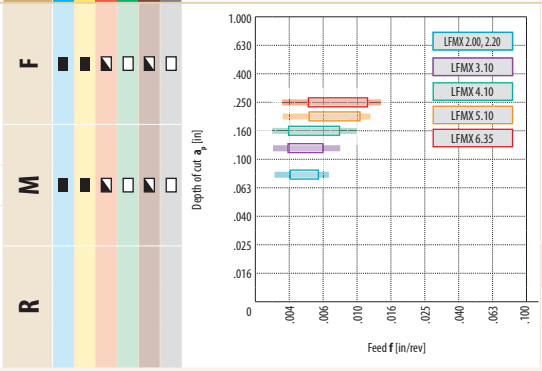
M2 (LFMX)

Geometry: Clamping designation **X**

Workpiece material group — Turning: P M K N S H

Profile of cutting edge





Application range

Description

Applied to inserts:
LFMX

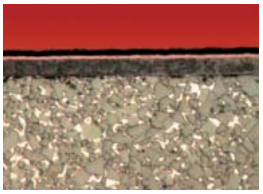
- Universal cutting geometry characterized by a low cutting resistance
- Parting and grooving
- Main application - machined material groups P and M
- Secondary application area - machined materials groups K and S
- Supplementary application - machined materials groups N and H
- For moderately interrupted cut

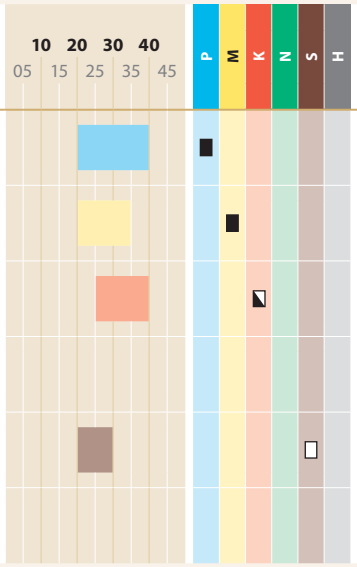
Range of cutting conditions:

f	See diagram
a_p	See diagram

Designation and microstructure	Application areas	Workpiece Material Group	Grade description and recommended application

6640

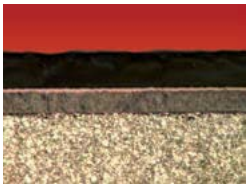


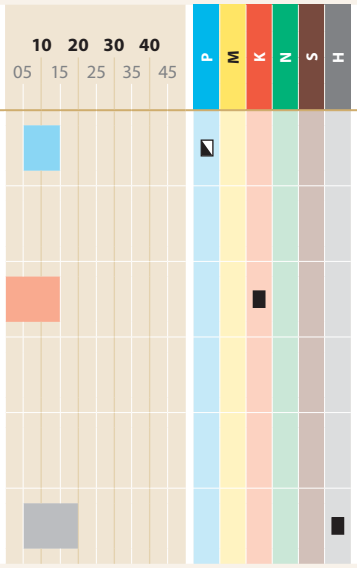


- substrate without cubic carbides (type H)
- thin coating with TiCN supporting layer, applied with the MT-CVD method
- especially for semi-roughing and roughing
- especially for material groups P, M, and K; potentially also group S
- lower to medium cutting speeds
- interrupted cut and suited to unfavourable machining conditions

T5305

UP!GRADE®

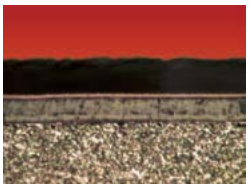


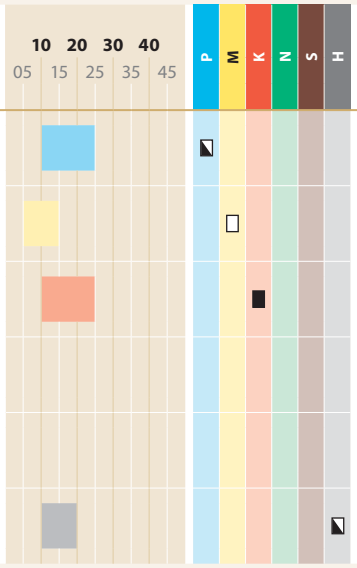


- fine-grained substrate with a low cobalt content
- thick layer of MT-CVD coating with a layer of Al_2O_3 on the surface
- special finish for coating
- designed for machining materials in groups K, P, and H
- top performance for machining grey cast iron
- material with the highest abrasion resistance of the 5300 series
- high cutting speeds
- continuous and slightly interrupted cut

T5315

UP!GRADE®

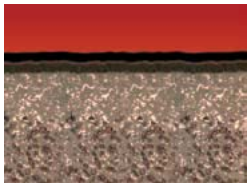


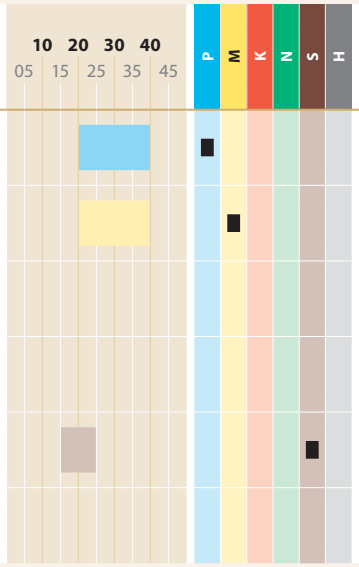


- fine-grained substrate with a modified cobalt content to increase strength
- thick MT-CVD coating combining the advantages of TiCN and Al_2O_3 layers
- special finish for coating
- versatile material designed primarily for turning grey and ductile cast iron
- can also be used for machining material groups P and H
- supplementary for also machining group M
- suitable for finishing and roughing
- medium to high cutting speeds
- suitable for continuous and interrupted cut

Designation and microstructure	Application areas	Workpiece Material Group	Grade description and recommended application

T7335

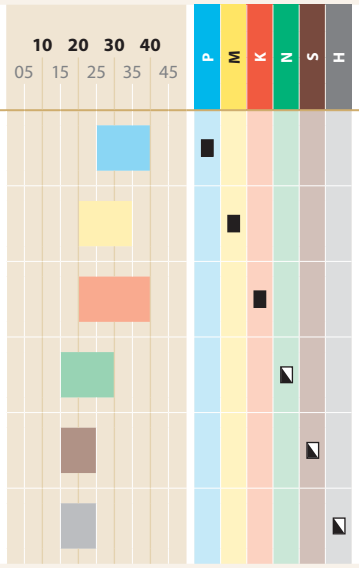




UP! GRADE®

- functionally gradient substrate with medium grain size
- relatively high cobalt content
- relatively thin coating applied with the MT-CVD method
- material shows very high strength
- special surface finish for coating
- designed for machining material groups M, S, and P
- medium cutting speeds
- continuous and heavily interrupted cut
- also withstands very unfavourable machining conditions

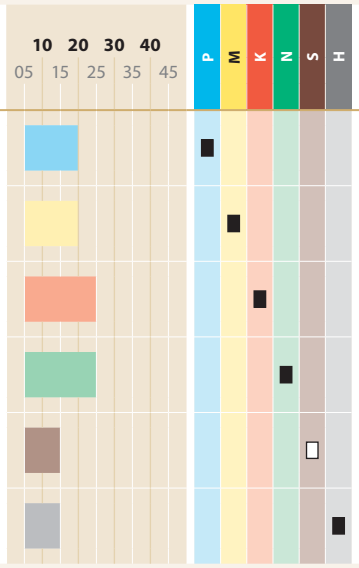
T8030



UP! GRADE®

- sub-micron substrate with a relatively high cobalt content
- mono-layer PVD coating
- lower internal coating tension with high hardness
- highly versatile, wide-ranging material
- especially for inserts for thread turning
- medium cutting speeds
- suitable for machining material groups M, P, and K; potentially also N, S, and H
- good operative reliability
- impaired machining conditions

T8315

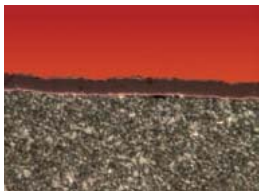


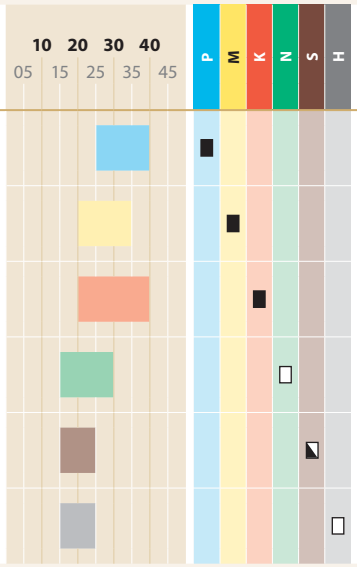
UP! GRADE®

- highly abrasion resistant material of the T8300 series with guaranteed strength
- sub-micron substrate with a relatively low cobalt content
- nano-layered PVD coating with gradient transitions
- lower internal coating tension with higher hardness
- lower notch wear on the main cutting edge
- higher cutting speeds
- medium chip cross-sections
- suitable for machining material groups M, P, K, N and H; potentially also S
- stable machining conditions

Designation and microstructure	Application areas	Workpiece Material Group	Grade description and recommended application

T8330

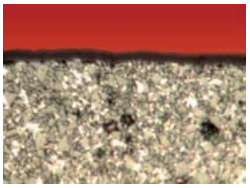


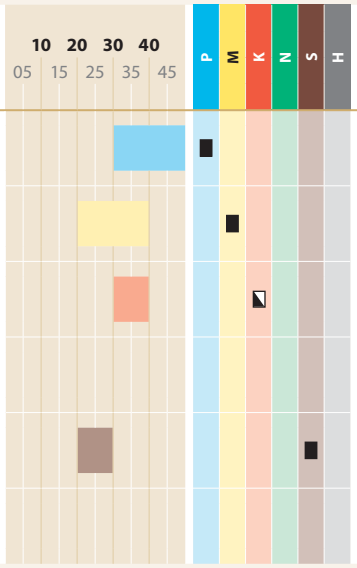


UP!GRADE®

- the most versatile member of the T8300 series
- sub-micron substrate with a relatively high cobalt content
- nano-layered PVD coating with gradient transitions
- lower internal coating tension with higher hardness
- lower notch wear on the main cutting edge
- medium cutting speeds
- suitable for machining material groups M, P, and K; potentially also N, S, and H
- good operative reliability
- impaired machining conditions

T8345

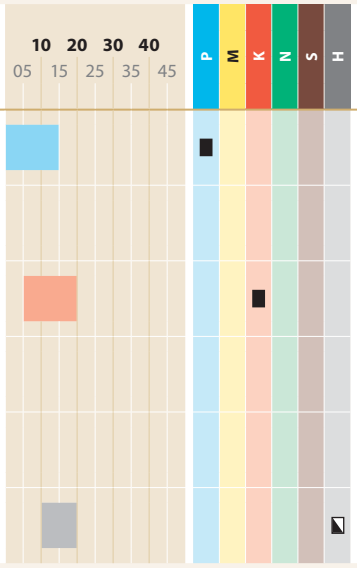




UP!GRADE®

- the toughest member of the T8300 series
- sub-micron substrate with a high cobalt content
- nano-layered PVD coating with gradient transitions
- lower internal coating tension with higher hardness
- lower notch wear on the main cutting edge
- lower to medium cutting speeds and bigger chip cross-sections
- suitable for machining material groups M, P and S; potentially also K
- good operative reliability
- interrupted cut, unstable machining conditions

T9310

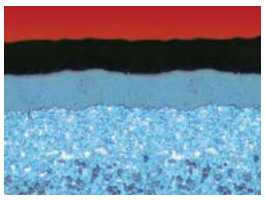


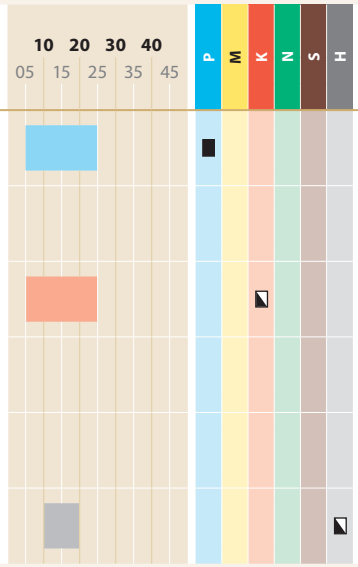
UP!GRADE®

- fine-grained, functionally gradient substrate
- low cobalt content
- thick MT-CVD coating with a special Al_2O_3 layer
- exceptional thermal and chemical stability ensures excellent protection of the bearing material
- special surface finish for coating
- primarily designed for machining material groups P, K, and H
- high cutting speeds
- continuous to slightly interrupted cut

Designation and microstructure	Application areas	Workpiece Material Group	Grade description and recommended application

T9315

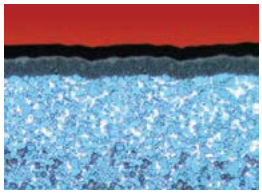


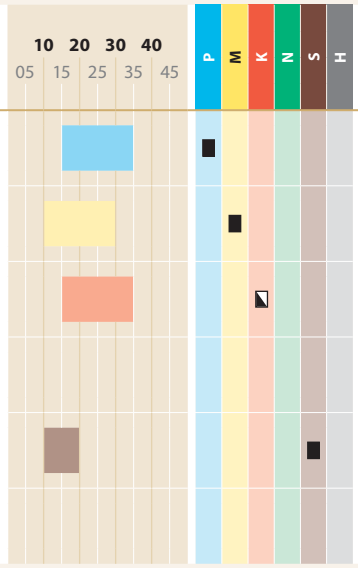


UP! GRADE®

- functionally gradient substrate with fine structure
- relatively low cobalt content
- thick MT-CVD coating with a dominant Al_2O_3 layer
- highly versatile material with a balanced ratio of abrasion resistance and operative reliability
- special surface finish for coating
- primarily designed for machining material groups P, K, and H
- high cutting speeds
- continuous to slightly interrupted cut

T9325

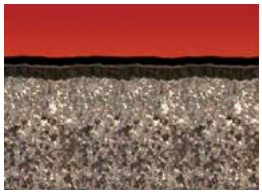


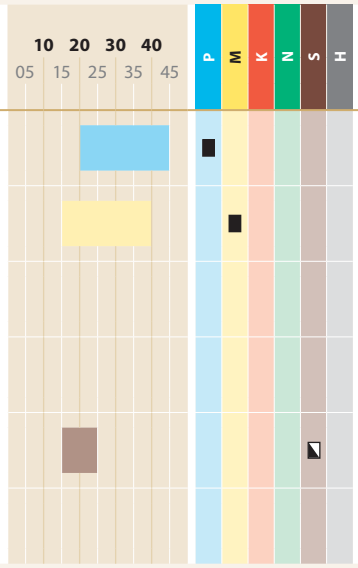


UP! GRADE®

- functionally gradient substrate
- relatively low content of cobalt binder phase
- thick MT-CVD coating
- highly versatile material with very good operational reliability
- special surface finish for coating
- primarily designed for machining material groups P, M, K and S
- medium and higher cutting speed
- continuous and interrupted cut
- unfavourable cutting conditions, continuous and/or interrupted cuts

T9335





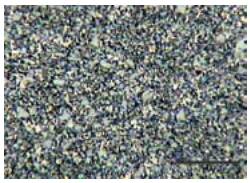
UP! GRADE®

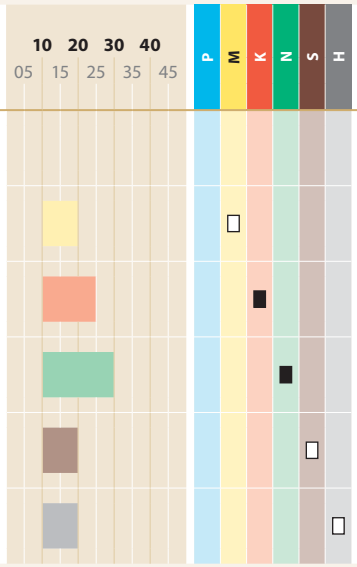
- functionally gradient substrate with medium grain size
- relatively high cobalt content
- MT-CVD coating of medium thickness
- material shows very high strength
- special surface finish for coating
- designed for machining material groups P, M, and S
- medium cutting speeds
- continuous and heavily interrupted cut
- also withstands very unfavourable machining conditions

■ Main application ◥ Secondary application □ Supplementary application

Designation and microstructure	Application areas	Workpiece Material Group	Grade description and recommended application

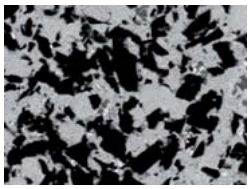
HF7

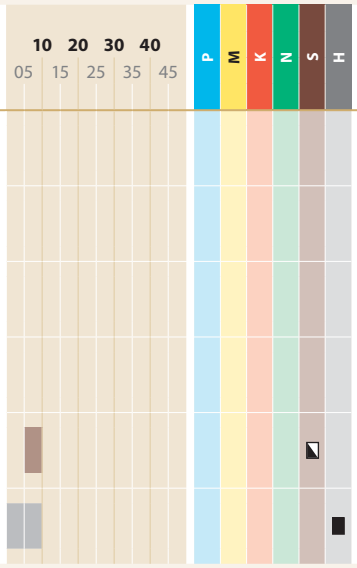




- sub-micron material without cubic carbides (type H) with a low cobalt content
- very versatile in terms of machined materials (recommended for all groups with the exception of P)
- small to medium chip cross-sections
- stable machining conditions

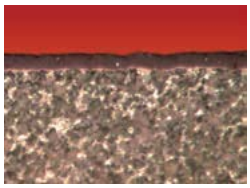
TB310

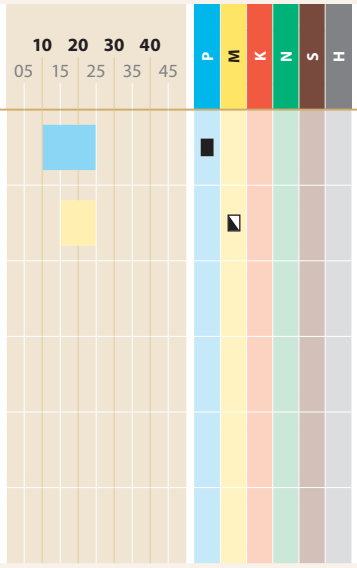




- polycristalline cubic boron nitride
- material suitable for machining hardened steel
- excellent wear resistance
- for machining material group s and H
- finishing work with high-strength steel, also suitable for slightly interrupted cut
- stable machining conditions

TT310





- special material designed especially for finishing work
- cermet-based substrate with high abrasion resistance and good thermal and chemical stability
- TiAlN-based nano-layered PVD coating equipped with an end gold layer of TiN for abrasion indication.
- for machining material group P, potentially also group M
- suitable for finishing applications with low feeds
- stable machining condition
- medium to high cutting speeds

■ Main application ◪ Secondary application □ Supplementary application

The first and most important step is to classify the material to be machined into one of the six groups, see Table No. 1 on page T175. According to this material group, find the appropriate table in the following section.

For a specific workpiece material group and with regard to the nature of the operation (fine, finishing, semi-roughing, roughing, heavy roughing in turning, parting and threading) select a combination of cutting material and the insert's chip breaker - use tables 2a - 7a on pages T210 - T220. These tables specify several alternatives numbered from I to III for each group of workpiece material.

Use tables 2b – 7b on pages T211 - T221to select the starting cutting speed according to the insert's cutting material, shape, feed and swarf depth. The starting cutting speeds are set for a standard material and a durability of 15 min (45 min for heavy roughing) without coolant. Coolant is used for threading, parting and grooving operations.

The tables mentioned in the previous step are supplemented with correction coefficients for the conversion of cutting speeds when turning with regard to the insert's shape, machine condition, required tool life, workpiece material and hardness. Therefore, where necessary, use these correction coefficients to calculate the final starting speed:

$$v_c = v_{15} . k_{vbd} k_{vx} . k_{vT} . k_{vHB} . (k_{vN})$$

Please note that cutting speed determined in this way is the initial value (default) defining the basic level of cutting speed for a given operation. Above all, the range of machinability values of the workpiece material, which may be as much as two grades of machinability for high-grade steels, is often the reason for modifying a certain cutting speed if you require to achieve relatively accurate economical tool life.

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group		CUTTING INSERTS TYPE according to ISO		Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
				f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
				a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
				Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
P	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I	T8315	T8315	TT310	T8315	T9315	T9325	T9315	T9315	T9325	T9325	-	-	-
				FF	FF	FM	FM	FM	FM	RM (W-M)	R (W-M)	OR	SR	-	-	-
			II	-	-	T9315	T8330	T9325	T8330	T9325	T9325	T9335	T9335	-	-	-
				-	-	FM	FM	NM	NM	RM (W-M)	R (W-M)	OR	SR	-	-	-
			III	-	-	T9315	T9315	T8330	T9325	T9325	T8330	T8330	T8345	-	-	-
				-	-	W-F	W-F	NM	M (W-M)	OR (NR2)	NR2 (OR)	OR	SR	-	-	-
	..X	LNUX, LNMX	I	-	-	-	-	-	-	-	-	T9310	T9315	-	-	-
				-	-	-	-	-	-	-	-			-	-	-
			II	-	-	-	-	-	-	-	-	T9315	T9325 (T9335)	-	-	-
				-	-	-	-	-	-	-	-			-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I	TT310	T8315	TT310	T8315	T5315	T9315	-	-	T9325	T9335	-	-	-
				UR	FF	UR	FF	RM	RM	-	-	OR	OR	-	-	-
			II	T8315	T8330	T9315	T9325	T9315	T9325	-	-	T9325	T9335	-	-	-
				FF	FF	FM	FM	RM	RM	-	-	SR	SR	-	-	-
			III	8016	-	T8315	T8330	T9325	T8330	-	-	-	-	-	-	-
				Al	-	UR	FM	RM	RM	-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I	T8330	T8330	T8330	T8330	-	-	-	-	-	-	T8330	T8330	-
				-	-	-	-	-	-	-	-	-	-			-
			II	-	-	-	-	-	-	-	-	-	-	T9325	T9325 (6640)	-
				-	-	-	-	-	-	-	-	-	-			-
		TN11.., TN16.., TN 22	I											-	-	T8030

Turning operation	Priority of choice	Range of feeds and depth of cut: Feed f [in/rev]	Depth of cut a_p [in]	P: 6640	T5305	T5315	T7335	T9310	T9315	T9325	T9335	T8030	T8315	T8330	T8345	TT310	Durability
				S..	S..	S..	S..	S..	S..	S..	S..	S..	S..	S..	S..	S..	
				C..	C..	C..	C..	C..	C..	C..	C..	C..	C..	C..	C..	C..	
				W..	W..	W..	W..	W..	W..	W..	W..	W..	W..	W..	W..	W..	
Fine turning	I	.002	.020	-	2065	-	-	-	-	-	-	-	1345	1015	1000	1690	V_{15} [min]
	II	.003	.020	-	1770	-	-	-	-	-	-	-	1165	900	855	1460	
	III	.004	.020	-	1640	-	-	-	-	-	-	-	1085	855	785	1360	
Finishing	I	.004	.060	-	1475	1200	1065	1215	1115	1085	920	-	970	755	705	1215	
	II	.006	.060	-	1280	1100	900	1085	1035	985	835	-	855	675	605	1065	
	III	.008	.060	-	1165	1035	805	1000	970	920	770	-	785	625	540	970	
Semi-roughing	I	.008	.100	-	1115	985	770	950	920	885	740	-	740	605	525	-	
	II	.012	.100	-	970	900	655	855	855	805	675	-	655	540	445	-	
	III	.016	.100	-	885	835	575	785	805	755	625	-	605	490	410	-	
Roughing	I	.016	.200	-	820	785	540	740	755	690	575	-	560	460	375	-	
	II	.024	.200	-	720	720	460	655	690	640	525	-	490	410	330	-	
	III	.031	.200	-	655	675	410	605	655	590	490	-	445	395	295	-	
Heavy roughing	I	.031	.500	-	360	460	310	-	475	425	345	-	-	280	195	-	V_{15} [min]
	II	.040	.500	-	345	445	280	-	445	410	330	-	-	260	180	-	
	III	.050	.500	-	310	425	260	-	425	395	295	-	-	245	165	-	
Parting, grooving and copying		.004	-	625	-	-	-	-	-	720	-	-	-	490	-	-	V_{15} [min] with cooling
		.006	-	560	-	-	-	-	-	690	-	-	-	475	-	-	
		.008	-	490	-	-	-	-	-	655	-	-	-	445	-	-	
		.012	-	410	-	-	-	-	-	590	-	-	-	395	-	-	
Front and internal grooving		.004	-	-	-	-	-	-	-	575	-	-	-	395	-	-	
		.006	-	-	-	-	-	-	-	540	-	-	-	375	-	-	
		.008	-	-	-	-	-	-	-	525	-	-	-	345	-	-	
		.012	-	-	-	-	-	-	-	460	-	-	-	310	-	-	
Threading				-	-	-	-	-	-	-	-	360	-	425	-	-	
				-	-	-	-	-	-	-	-	330	-	395	-	-	
				-	-	-	-	-	-	-	-	310	-	375	-	-	

CORRECTION v_c

Subgroup	P1	P2	P3	P4
Work piece hardness factor				
Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
120	**1.53**	1.18	.94	.71
140	**1.46**	1.12	.90	.67
160	**1.37**	1.05	.84	.63
180	**1.30**	**1.00**	.80	.60
200	**1.24**	**.95**	.76	.57
220	**1.17**	**.90**	**.72**	.54
240	**0.12**	**.86**	**.69**	.52
260	**1.07**	**.82**	**.66**	**.49**
280	1.04	**.80**	**.64**	**.48**
300	1.00	**.77**	**.62**	**.46**
320	.96	.74	**.59**	**.44**
340	.92	.71	**.57**	**.43**
360	.88	.68	.54	**.41**
375	.85	.65	.52	**.39**

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	.84
15	1.00	45	.76
20	.93	60	.71

Correction for durability (heavy roughing)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
30	1.10	60	.93
45	1.00		

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S..., C..., W...	1.00
T..., D..., K...	.95
V..., L... (Parting and grooving)	.88
R..., L... (Heavy roughing)	1.10

PRAMET

Table 3a

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group	CUTTING INSERTS TYPE according to ISO			Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
				f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
				a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
				Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
M	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I	T8315	T8315	TT310	T8315	T9325	T9325	T9325	T8315	T9325	T9335	-	-	-
				FF	FF	FM	FM	NM (SI)	FM	RM	RM	NR2 (OR)	NR2 (OR)	-	-	-
			II	-	-	T9315	T8330	T7335	T7335	T7335	T7335	T7335	T9335	-	-	-
				-	-	FM	FM	NM (SI)	FM	NR	R	NR2 (OR)	SR	-	-	-
			III	-	-	-	-	T8330	T8330	T7335	T8330	-	-	-	-	-
				-	-	-	-	NM (SI)	FM	RM	NR2 (OR)	-	-	-	-	-
	..X	LNUX, LNMX	I	-	-	-	-	-	-	-	-	**T9310**	**T9315**	-	-	-
				-	-	-	-	-	-	-	-			-	-	-
			II	-	-	-	-	-	-	-	-	T9315	T9325 (T9335)	-	-	-
				-	-	-	-	-	-	-	-			-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I	**TT310**	**T8315**	**TT310**	**T8315**	**T5315**	**T9315**	-	-	**T9325**	**T9335**	-	-	-
				UR	FF	UR	FF	RM	RM	-	-	OR	OR	-	-	-
			II	T8315	T8330	T9315	T7335	T9315	T7335	-	-	T9325	T9335	-	-	-
				FF	FF	FM	FM	RM	RM	-	-	SR	SR	-	-	-
			III	-	-	T8315	T8330	T7335	T8330	-	-	-	-	-	-	-
				-	-	UR	FM	RM	RM	-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I	**T8330**	**T8330**	**T8330**	**T8330**	-	-	-	-	-	-	**T8330**	**T8330**	-
				-	-	-	-	-	-	-	-	-	-			-
			II	-	-	-	-	-	-	-	-	-	-	T9325	T9325 (6640)	-
				-	-	-	-	-	-	-	-	-	-			-
		TN11.., TN16.., TN 22	I	-	-	-	-	-	-	-	-	-	-	-	-	T8030

CHOICE OF INITIAL CUTTING CONDITIONS

Turning operation	Priority of choice	Range of feeds and depth of cut		M														
				6640	T5315	T7335	T93.25	T9335		T8030	T8315	T8330	T8345		HF7	TT310		Durability
		Feed f [in/rev]	Depth of cut, ap [in]	S.	S.	S.	S.	S.		S.	S.	S.	S.		S.	S.		
				C.	C.	C.	C.	C.		C.	C.	C.	C.		C.	C.		
				W.	W.	W.	W.	W.		W.	W.	W.	W.		W.	W.		
Fine turning	I	.00.2	.0.20	-	-	-	-	-		-	805	605	590		655	1015		V_{15} [min]
	II	.003	.0.20	-	-	-	-	-		-	705	540	510		540	870		
	III	.004	.0.20	-	-	-	-	-		-	655	510	460		490	805		
Finishing	I	.004	.060	-	705	640	655	540		-	575	445	410		445	720		
	II	.006	.060	-	655	540	590	490		-	510	410	360		375	640		
	III	.008	.060	-	605	475	560	460		-	475	375	330		330	575		
Semi-roughing	I	.008	.100	-	590	460	252	445		-	445	360	310		310	-		
	II	.0.1.2	.100	-	540	395	475	395		-	395	310	260		280	-		
	III	.0.16	.100	-	510	345	445	375		-	360	295	245		245	-		
Roughing	I	.0.16	.200	-	475	330	410	345		-	330	280	230		-	-		
	II	.0.24	.200	-	425	280	375	310		-	295	245	195		-	-		
	III	.03.1	.200	-	410	245	345	295		-	260	230	180		-	-		
Heavy roughing	I	.03.1	.500	-	280	180	260	195		-	-	165	115		-	-		V_{fc} [min]
	II	.040	.500	-	260	165	245	195		-	-	150	100		-	-		
	III	.050	.500	-	245	150	230	180		-	-	150	100		-	-		
Parting, grooving and copying		.004	-	.360	-	-	425	-		-	-	295	-		-	-		V_{15} [min] with cooling
		.006	-	.330	-	-	410	-		-	-	280	-		-	-		
		.008	-	.295	-	-	395	-		-	-	260	-		-	-		
		.0.1.2	-	.245	-	-	360	-		-	-	230	-		-	-		
Front and internal grooving		.004	-	-	-	-	330	-		-	-	230	-		-	-		
		.006	-	-	-	-	330	-		-	-	215	-		-	-		
		.008	-	-	-	-	310	-		-	-	195	-		-	-		
		.0.1.2	-	-	-	-	280	-		-	-	180	-		-	-		
Threading				-	-	-	-	-		215	-	260	-		-	-		
				-	-	-	-	-		195	-	230	-		-	-		
				-	-	-	-	-		180	-	215	-		-	-		

CORRECTION v_c

Subgroup	M1	M2	M3	M3
Work piece hardness factor				
Hardness	kv_{HBM1}	kv_{HBM2}	kv_{HBM3}	kv_{HBM4}
120	**1.35**	1.31	1.24	1.15
140	**1.28**	**1.24**	1.18	1.10
160	**1.22**	**1.18**	**1.12**	1.04
180	**1.14**	**1.11**	**1.05**	.98
200	**1.09**	**1.06**	**1.00**	.93
220	**1.03**	**1.00**	**.95**	.88
240	.98	**.95**	**.90**	**.84**
260	.93	**.91**	**.86**	**.80**
280	.89	**.87**	**.82**	**.76**
300	.87	**.84**	**.80**	**.74**
320	.84	**.81**	.77	**.72**
340	.80	.78	.74	**.69**
360	.77	.75	.71	**.66**
375	.74	.72	.68	**.63**

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	.84
15	1.00	45	.76
20	0.93	60	.71

Correction for durability (heavy roughing)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
30	1.10	60	.93
45	1.0		

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S..., C..., W...	1.00
T..., D..., K...	.95
V..., L... (Parting and grooving)	.88
R..., L... (Heavy roughing)	1.10

PRAMET

Table 4a

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group	CUTTING INSERTS TYPE according to ISO		Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
			f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
			a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
			Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
K	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I T5305	I T5305	I T5305	I T5305	I T5305	I T5305	I T5305	I T5315	I T9325	I T9325	I -	I -	I -
				M		M		R	RM	RM	OR	SR	-	-	-
			II T5305	II T5315	II T5305	II T5315	II T5305	II T5315	II T5305	II T5315	II T9335	II T9335	II -	II -	II -
			M	M	M	M	M	M (W-M)	R (RM)	R (RM)	OR	SR	-	-	-
			III -	III T8315	III -	III T8315	III T5305	III T9325	III T9325	III T9325	III T8330	III T8345	III -	III -	III -
				FF		FF	-	R (W-M)	RM	R (W-M)	OR	SR	-	-	-
	..X	LNMX	I -	I -	I -	I -	I -	I -	I -	I -	I T9310	I T9315	I -	I -	I -
			-	-	-	-	-	-	-	-			-	-	-
			II -	II -	II -	II -	II -	II -	II -	II -	II T9315	II T9325 (T9335)	II -	II -	II -
			-	-	-	-	-	-	-	-			-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I T5305	I T5305	I T5305	I T5305	I T5305	I T9315	I -	I -	I T9325	I T9335	I -	I -	I -
			UR	-	UR	-	RM	RM	-	-	OR	OR	-	-	-
			II T5305	II T5315	II T5305	II T5315	II T5315	II T9325	II -	II -	II T9325	II T9335	II -	II -	II -
			_	-	_	-	RM	RM	-	-	SR	SR	-	-	-
			III T5315	III T8315	III T5315	III T8315	III T9315	III T8330	III -	III -	III -	III -	III -	III -	III -
			UR	FF	UR	FF(FM)	RM	RM	-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I T8330	I T8330	I T8330	I T8330	I -	I -	I -	I -	I -	I -	I T8330	I T8330	I -
			-	-	-	-	-	-	-	-	-	-			-
			II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II T9325 (6630)	II T9325 (6640)	II -
		TN11.., TN16.., TN 22	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I T8030

CHOICE OF INITIAL CUTTING CONDITIONS

Table 4b

CHOICE OF INITIAL CUTTING CONDITIONS

Turning operation	Priority of choice	Range of feeds and depth of cut: Feed f [in/rev]	Depth of cut, a_p [in]	K: 6640 S..	6640 C..	6640 W..	T5305 S..	T5305 C..	T5305 W..	T5315 S..	T5315 C..	T5315 W..	T9310 S..	T9310 C..	T9310 W..	T9315 S..	T9315 C..	T9315 W..	T9325 S..	T9325 C..	T9325 W..	T8030 S..	T8030 C..	T8030 W..	T8315 S..	T8315 C..	T8315 W..	T8330 S..	T8330 C..	T8330 W..	T8345 S..	T8345 C..	T8345 W..	TB310 S..	TB310 C..	TB310 W..	Durability
Fine turning	I	.002	.020	-	-	-	1970	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1280	970	950	-	-	-	-	-	820	-	-	V_{15} [min]
	II	.003	.020	-	-	-	1675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1115	855	805	-	-	-	-	-	820	-	-	
	III	.004	.020	-	-	-	1560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1035	805	740	-	-	-	-	-	820	-	-	
Finishing	I	.004	.060	-	-	-	1395	1130	1150	1065	1035	-	-	-	-	-	-	-	-	-	-	-	-	-	920	720	675	-	-	-	-	-	820	-	-	
	II	.006	.060	-	-	-	1215	1035	1035	985	935	-	-	-	-	-	-	-	-	-	-	-	-	-	820	640	575	-	-	-	-	-	820	-	-	
	III	.008	.060	-	-	-	1115	985	950	920	885	-	-	-	-	-	-	-	-	-	-	-	-	-	740	605	252	-	-	-	-	-	820	-	-	
Semi-roughing	I	.008	.100	-	-	-	1050	935	900	885	835	-	-	-	-	-	-	-	-	-	-	-	-	-	705	575	490	-	-	-	-	-	-	-	-	
	II	.012	.100	-	-	-	920	855	805	805	755	-	-	-	-	-	-	-	-	-	-	-	-	-	625	510	425	-	-	-	-	-	-	-	-	
	III	.016	.100	-	-	-	835	805	755	770	705	-	-	-	-	-	-	-	-	-	-	-	-	-	575	475	395	-	-	-	-	-	-	-	-	
Roughing	I	.016	.200	-	-	-	770	755	705	705	655	-	-	-	-	-	-	-	-	-	-	-	-	-	525	445	360	-	-	-	-	-	-	-	-	
	II	.024	.200	-	-	-	375	690	625	655	605	-	-	-	-	-	-	-	-	-	-	-	-	-	460	395	310	-	-	-	-	-	-	-	-	
	III	.031	.200	-	-	-	625	640	575	625	560	-	-	-	-	-	-	-	-	-	-	-	-	-	425	360	280	-	-	-	-	-	-	-	-	
Heavy roughing	I	.031	.500	-	-	-	345	445	-	445	410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260	180	-	-	-	-	-	-	-	V_{15} [min]
	II	.040	.500	-	-	-	330	425	-	425	395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	245	165	-	-	-	-	-	-	-	
	III	.050	.500	-	-	-	295	410	-	410	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	150	-	-	-	-	-	-	-	
Parting, grooving and copying		.004	-	590	-	-	-	-	-	-	-	-	-	-	-	-	-	-	675	-	-	-	-	-	475	-	-	-	-	-	-	-	-	V_{15} [min] with cooling
		.006	-	525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	655	-	-	-	-	-	460	-	-	-	-	-	-	-	-	
		.008	-	460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	625	-	-	-	-	-	425	-	-	-	-	-	-	-	-	
		.012	-	395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	560	-	-	-	-	-	375	-	-	-	-	-	-	-	-	
Front and internal grooving		.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	525	-	-	-	-	-	375	-	-	-	-	-	-	-	-	
		.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	525	-	-	-	-	-	360	-	-	-	-	-	-	-	-	
		.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	490	-	-	-	-	-	330	-	-	-	-	-	-	-	-	
		.012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	445	-	-	-	-	-	295	-	-	-	-	-	-	-	-	
Threading				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-	410	-	-	-	-	-	-	-	-	
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	-	-	375	-	-	-	-	-	-	-	-	
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	-	-	360	-	-	-	-	-	-	-	-	

CORRECTION v_c

Subgroup	K1	K2	K3	K4
Work piece hardness factor				
Hardness	kv_{HBK1}	kv_{HBK2}	kv_{HBK3}	kv_{HBK4}
120	1.60	.,52	1.44	1.36
140	1.45	1.38	1.31	1.23
160	1.35	**1.28**	1.22	1.15
180	1.25	**1.19**	**1.13**	1.06
200	**1.10**	**1.05**	**.99**	.94
220	**1.00**	**.95**	**.90**	.85
240	**.90**	**.86**	**.81**	.77
260	**.80**	.76	.72	.68
280	**.70**	.67	.63	**.60**
300	.65	.62	.59	**.55**
320	.60	.57	.54	**.51**
340	.55	.52	.50	**.47**
360	.50	.48	.45	.43
375	.40	.38	.36	.34

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	.84
15	1.0	45	.76
20	.93	60	.71

Correction for durability (heavy roughing)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
30	1.10	60	.93
45	1.0		

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S..., C..., W...	1.00
T..., D..., K...	.95
V..., L... (Parting and grooving)	.88
R..., L... (Heavy roughing)	1.10

PRAMET

Table 5a

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group	CUTTING INSERTS TYPE according to ISO		Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
			f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
			a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
			Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
N	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -
			-	-	-	-	-	-	-	-	-	-	-	-	-
			II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -
			-	-	-	-	-	-	-	-	-	-	-	-	-
			III T8315	III T8315	III T8330	III T8330	III T8330	III T8330	III T8330	III T8330	III -	III -	III -	III -	III -
			FF	FF	SI	SI	NM	NM	NM	NR	-	-	-	-	-
	..X	LNUX, LNMX	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -
			-	-	-	-	-	-	-	-	-	-	-	-	-
			II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II -
			-	-	-	-	-	-	-	-	-	-	-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -
			-	-	-	-	-	-	-	-	-	-	-	-	-
			II HF7	II HF7	II HF7	II HF7	II HF7	II HF7	II -	II -	II -	II -	II -	II -	II -
			AL	AL	AL	AL	AL	AL	-	-	-	-	-	-	-
			III -	III -	III -	III -	III -	III -	III -	III -	III -	III -	III -	III -	III -
			-	-	-	-	-	-	-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I T8330	I T8330	I -
			-	-	-	-	-	-	-	-	-	-			-
			II -	II -	II -	II -	II -	II -	II -	II -	II -	II -	II T9325	II T9325	II -
			-	-	-	-	-	-	-	-	-	-			-
		TN11.., TN16.., TN22	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I -	I T8030

CHOICE OF INITIAL CUTTING CONDITIONS

Turning operation	Priority of choice	Range of feeds and depth of cut		N										Durability
				T8030	T8315	T8330			HF7					
		Feed f [in/rev]	Depth of cut, ap [in]	S..	S..	S..			S..					
				C..	C..	C..			C..					
				W..	W..	W..			W..					
Fine turning	I	.002	.020	-	-	-			2740					V_{15} [min]
	II	.003	.020	-	-	-			2280					
	III	.004	.020	-	-	-			2085					
Finishing	I	.004	.060	-	2445	1905			1870					
	II	.006	.060	-	2165	1705			1590					
	III	.008	.060	-	1970	1590			1425					
Semi-roughing	I	.008	.100	-	1870	1510			1360					
	II	.012	.100	-	1655	1360			1150					
	III	.016	.100	-	1510	1265			1035					
Roughing	I	.016	.200	-	-	-			-					
	II	.024	.200	-	-	-			-					
	III	.031	.200	-	-	-			-					
Heavy roughing	I	.031	.500	-	-	-			-					V_{45} [min]
	II	.040	.500	-	-	-			-					
	III	.050	.500	-	-	-			-					
Parting, grooving and copying		.004	-	-	-	1245			-					V_{15} [min] with cooling
		.006	-	-	-	1200			-					
		.008	-	-	-	1115			-					
		.012	-	-	-	1015			-					
Front and internal grooving		.004	-	-	-	985			-					
		.006	-	-	-	950			-					
		.008	-	-	-	885			-					
		.012	-	-	-	805			-					
Threading				280	-	1100			-					
				255	-	1015			-					
				235	-	950			-					

CORRECTION v_c

Subgroup	N1	N2	N3	N4

Workpiece hardness factor

Legierungsarten / Alloy type	k_{vx}	Subgroup
Legierungsarten	2.00	N1
Al alloys formed, unhardened HB 60	1.50	
Al alloys formed, hardened HB100	**1.00**	
Al alloys cast, unhardened HB75	.90	N2
Al alloys cast, hardened HB90	.65	
Al alloys cast, unhardened HB 130 >12% Si	.20	
Highly machinable alloys (>1%Pb)	.90	N3
Brass and lead bronze (<1%Pb)	.75	
Other brass HB <90	.60	
Other brass HB >90	.54	N4
Bronze electrolytic Cu	.40	
Hard and very hard bronze	.20	

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	.84
15	1.0	45	.76
20	.93	60	.71

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S..., C..., W...	1.00
T..., D..., K...	.95
V..., L... (Parting and grooving)	.88
R..., L... (Heavy roughing)	1.10

PRAMET

Table 6a

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group	CUTTING INSERTS TYPE according to ISO			Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
				f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
				a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
				Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
S	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I	T8315	T8315	TT310	T8315	T9325	T9325	T9325	T8315	-	-	-	-	-
				FF	FF	FM	FM	NM (SI)	FM	RM	RM	-	-	-	-	-
			II	TB310	-	T9315	T8330	T7335	T7335	T7335	T7335	-	-	-	-	-
				-	-	FM	FM	NM (SI)	FM	NR	R	-	-	-	-	-
			III	-	-	-	-	T8330	T8330	T7335	T8330	-	-	-	-	-
				-	-	-	-	NM (SI)	FM	RM	NR2 (OR)	-	-	-	-	-
	..X	LNUX, LNMX	I	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	73 (78)	-	-	-	-	-	-	-
			II	-	-			-	-	-	-	-	-	-	-	-
				-	-			-	-	-	-	-	-	-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I	TT310	T8315	TT310	T8315	T5315	T9315	-	-	-	-	-	-	-
				UR	FF	UR	FF	RM	RM	-	-	-	-	-	-	-
			II	T8315	T8330	T9315	T7335	T9315	T7335	-	-	-	-	-	-	-
				FF	FF	FM	FM	RM	RM	-	-	-	-	-	-	-
			III	8310	-	T8315	T8330	T7335	T8330	-	-	-	-	-	-	-
				AI	-	UR	FM	RM	RM	-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I	T8330	T8330	T8330	T8330	-	-	-	-	-	-	T8330	T8330	-
				-	-	-	-	-	-	-	-	-	-			-
			II	-	-	-	-	-	-	-	-	-	-	T9325 (6630)	T9325 (6640)	-
				-	-	-	-	-	-	-	-	-	-			-
		TN11.., TN16.., TN22	I	-	-	-	-	-	-	-	-	-	-	-	-	T8030

Table 6a CHOICE OF INITIAL CUTTING CONDITIONS

Turning operation	Priority of choice	Range of feeds and depth of cut		S															Durability
				6640	T7335	T9325	T9335		T8030	T8315	T8330	T8345		HF7			TB310		
		Feed f [in/rev]	Depth of cut, ap [in]	S..	S..	S..	S..		S..	S..	S..	S..		S..			S..		
				C..	C..	C..	C..		C..	C..	C..	C..		C..			C..		
				W..	W..	W..	W..		W..	W..	W..	W..		W..			W..		
Fine turning	I	.002	.020	-	-	-	-		-	-	-	-		-			1310		V_{15} [min]
	II	.003	.020	-	-	-	-		-	-	-	-		-			1245		
	III	.004	.020	-	-	-	-		-	330	-	-		-			1150		
Finishing	I	.004	.060	-	.310	.330	.80		-	280	215	-		215			1085		
	II	.006	.060	-	.260	.295	.75		-	245	195	180		180			1050		
	III	.008	.060	-	.230	.280	.70		-	230	180	165		165			1015		
Semi-roughing	I	.008	.100	-	.230	.260	.65		-	215	180	150		150			-		
	II	.012	.100	-	.195	.230	.60		-	195	150	130		130			-		
	III	.016	.100	-	.165	.215	.55		-	180	150	115		115			-		
Roughing	I	.016	.200	-	.165	.195	.50		-	-	130	115		-			-		
	II	.024	.200	-	.130	.180	.45		-	-	-	-		-			-		
	III	.031	.200	-	.115	.165	.45		-	-	-	-		-			-		
Heavy roughing	I	.031	.500	-	-	-	-		-	-	-	-		-			-		V_{45} [min]
	II	.040	.500	-	-	-	-		-	-	-	-		-			-		
	III	.050	.500	-	-	-	-		-	-	-	-		-			-		
Parting, grooving and copying		.004	-	.180	-	.215	-		-	-	150	-		-			-		V_{15} [min] with cooling
		.006	-	.165	-	.195	-		-	-	130	-		-			-		
		.008	-	.150	-	.195	-		-	-	130	-		-			-		
		.012	-	.115	-	.180	-		-	-	115	-		-			-		
Front and internal grooving		.004	-	-	-	.165	-		-	-	115	-		-			-		
		.006	-	-	-	.150	-		-	-	100	-		-			-		
		.008	-	-	-	.150	-		-	-	100	-		-			-		
		.012	-	-	-	.130	-		-	-	80	-		-			-		
Threading				-	-	-	-		100	-	130	-		-			-		
				-	-	-	-		100	-	115	-		-			-		
				-	-	-	-		80	-	100	-		-			-		

CORRECTION v_c

Subgroup	S1	S2	S3	S4

Work piece hardness factor

Hardness	kv_{HBS1}	kv_{HBS2}	kv_{HBS3}	kv_{HBS4}
120	**2.14**	**1.46**	1.22	.92
140	**2.01**	**1.38**	1.15	**.86**
160	**1.93**	**1.32**	1.10	**.83**
180	**1.89**	**1.30**	1.08	**.81**
200	**1.84**	**1.26**	**.05**	**.79**
220	**1.80**	**1.24**	**.03**	**.77**
240	**1.75**	**1.20**	**.00**	**.75**
260	**1.70**	**1.16**	**.97**	**.73**
280	**1.61**	**1.10**	**.92**	**.69**
300	**1.54**	1.06	**.88**	**.66**
320	**1.47**	1.01	**.84**	**.63**
340	**1.40**	.96	**.80**	.60
360	**1.37**	.94	**.78**	.59
375	**1.30**	.89	.74	.56

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	.84
15	1.0	45	.76
20	.93	60	.71

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S..., C..., W...	1.00
T..., D..., K...	.95
V..., L... (Parting and grooving)	.88
R..., L... (Heavy roughing)	1.10

PRAMET

Table 7a

CUTTING CONDITIONS FOR TURNING

Machined material, the main ISO group		CUTTING INSERTS TYPE according to ISO		Fine turning		Finishing		Semi-roughing		Roughing		Heavy roughing		Parting, grooving		Threading
				f = .002 - .004 [in/rev]		f = .002 - .004 [in/rev]		f = .008 - .016 [in/rev]		f = .016 - .040 [in/rev]		f > .040 [in/rev]		f = .002 - .012		
				a_p = .020 - .040 [in]		a_p = .040 - .080 [in]		a_p = .080 - .160 [in]		a_p = .160 - .400 [in]		a_p > .400 [in]				
				Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Pre-machined surface non-interrupted cut	Casting, forging interrupted cut	Peripheral grooving and parting	Front grooving and parting	-
H	..A ..M ..G ..U ..N	CNMA, CNMM, CNMG, DNMM, DNMG, DNMG, SNMA, SNMM, SNMG, SNMX, TNMA, TNMM, TNMG, RNMA, RNMG, WNMA, WNMM, WNMG	I	T5305	T5305	T5305	T5305	T5305	T5305	-	-	-	-	-	-	-
					M		M	R	R	-	-	-	-	-	-	-
			II	T5305	T5315	T5305	T5315	T5305	T5315	-	-	-	-	-	-	-
				M	M	M	M	M	M (W-M)	-	-	-	-	-	-	-
			III	-	T8315	-	T8315	T5305	T5315	-	-	-	-	-	-	-
				-	FF	-	FF	-	R (W-M)	-	-	-	-	-	-	-
	..X	LNUX, LNMX	I	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-
			II	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-
	..W ..T	CCMW, CCMT, SCMW, SCMT, DCMW, DCMT, TCMW, TCMT, VCMW, VCMT, WCMW, WCMT, RCMW, RCMT, RCMX	I	T5305	T5305	T5305	T5305	T5305	T9315	-	-	-	-	-	-	-
				RM	-	RM	-	RM	RM	-	-	-	-	-	-	-
			II	T5305	T5315	T5305	T5315	T5315	T8330	-	-	-	-	-	-	-
				_	RM	_	RM	RM	RM	-	-	-	-	-	-	-
			III	T5315	T8330	T5315	T8330	T9315		-	-	-	-	-	-	-
				RM	RM	RM	RM	RM		-	-	-	-	-	-	-
	..X	LFMX, TN11.., TN16.., TN22..	I	T8330	T8330	T8330	T8330	-	-	-	-	-	-	T8330	T8330	-
				-	-	-	-	-	-	-	-	-	-			-
			II	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-
		TN11.., TN16.., TN22	I	-	-	-	-	-	-	-	-	-	-	-	-	T8030

Table 7a CHOICE OF INITIAL CUTTING CONDITIONS

Turning operation	Priority of choice	Range of feeds and depth of cut		H								
				T5305	T5315	T9310	T9315	T8030	T8315	T8330		T8310
				S..	S..	S..	S..	S..	S..	S..		S..
				C..	C..	C..	C..	C..	C..	C..		C..
				W..	W..	W..	W..	W..	W..	W..		W..
		Feed f [in/rev]	Depth of cut, ap [in]									Durability
Fine turning	I	.002	.020	-	-	-	-	-	-	-		655
	II	.003	.020	-	-	-	-	-	-	-		590
	III	.004	.020	.330	-	-	-	-	215	-		525
Finishing	I	.004	.060	295	230	230	230	-	180	150		475
	II	.006	.060	245	215	215	215	-	165	130		425
	III	.008	.060	230	195	195	195	-	150	115		375
Semi-roughing	I	.008	.100	215	195	180	180	-	150	115		-
	II	.012	.100	180	180	165	165	-	130	100		-
	III	.016	.100	165	165	150	150	-	-	100		-
Roughing	I	.016	.200	-	-	-	-	-	-	-		-
	II	.024	.200	-	-	-	-	-	-	-		-
	III	.031	.200	-	-	-	-	-	-	-		-
Heavy roughing	I	.031	.500	-	-	-	-	-	-	-		-
	II	.040	.500	-	-	-	-	-	-	-		-
	III	.050	.500	-	-	-	-	-	-	-		-
Parting, grooving and copying		.004	-	-	-	-	-	-	-	100		-
		.006	-	-	-	-	-	-	-	80		-
		.008	-	-	-	-	-	-	-	80		-
		.012	-	-	-	-	-	-	-	65		-
Front and internal grooving		.004	-	-	-	-	-	-	-	115		-
		.006	-	-	-	-	-	-	-	100		-
		.008	-	-	-	-	-	-	-	100		-
		.012	-	-	-	-	-	-	-	80		-
Threading				-	-	-	-	65	-	80		-
				-	-	-	-	65	-	65		-
				-	-	-	-	80	-	100		-

V_{15} [min]

V_{45} [min]

V_{15} [min] with cooling

CORRECTION v_c

Subgroup	H1	H2	H3	H4
Work piece hardness factor				
Hardness	kv_{HBH1}	kv_{HBH2}	kv_{HBH3}	kv_{HBH4}
380 / 40,8	**1.84**	**1.76**	1.60	1.52
400 / 42,7	**1.73**	**1.65**	1.50	1.43
420 / 44,6	**1.61**	**1.54**	1.40	1.33
440 / 46,5	**1.50**	**1.43**	1.30	1.24
460 / 48,1	**1.38**	**1.32**	**1.20**	1.14
500 / 50,8	**1.15**	**1.10**	**1.00**	0.95
520 / 52,0	1.09	1.05	**0.95**	0.90
540 / 53,5	1.04	.99	**0.90**	0.86
560 / 54,7	0.98	.94	**0.85**	0.81
580 / 55,7	0.92	.88	**0.80**	**0.76**
600 / 56,8	0.86	.83	0.75	**0.71**
620 / 57,9	0.81	.77	0.70	**0.67**
640 / 59,0	0.75	.72	0.65	**0.62**
>640 / >59	0.69	.66	0.60	**0.57**

Correction for durability (general machining)

Durability [min]	k_{vT}	Durability [min]	k_{vT}
10	1.10	30	0.84
15	1.0	45	0.76
20	.93	60	0.71

Correction factor k_{vx}

Skin of forging and casting	.70 - .80
Internal turning	.75 - .85
Interrupted cut	.80 - .90
Good machine conditions	1.05 - 1.20
Bad machine conditions	.85 - .95

Correction for insert shape

Insert shape	k
S.... C.... W...	1.00
T.... D.... K...	.95
V.... L... (Parting and grooving)	.88
R.... L... (Heavy roughing)	1.10

Surface quality in turning

The quality of the machined surface in turning depends on the feed rate f and the radius of the insert r_e. The values of surface roughness R_{max} and R_a are given in following tables 8a and 8b.

There are other factors that can influence surface roughness, please take the given values as a guide.

$$R_a = 33337 \cdot \frac{f_z^{1,88}}{r_\varepsilon^{0,97}} \quad [\mu in]$$

Table 8a

Feed f [in/rev]	r_ε Radius [in]																
	.004	.008	.016	.031	.039	.047	.063	.071	.078	.094	.118	.125	.137	.157	.196	.235	.314
	Surface R_a [µin]																
.002	58.5	29.9	15.2	7.8	6.3	5.3	4.0	3.5	3.2	2.7	2.2	2.0	1.9	1.6	1.3	1.1	0.8
.003	110.1	56.2	28.7	14.6	11.8	9.9	7.5	6.7	6.0	5.0	4.1	3.8	3.5	3.1	2.5	2.1	1.6
.003	141.5	72.2	36.9	18.8	15.2	12.7	9.6	8.6	7.7	6.5	5.2	4.9	4.5	4.0	3.2	2.7	2.0
.004	-	109.9	56.1	28.6	23.1	19.3	14.6	13.0	11.8	9.9	7.9	7.5	6.8	6.0	4.8	4.1	3.1
.005	-	154.8	79.0	40.3	32.5	27.2	20.6	18.4	16.6	13.9	11.2	10.5	9.6	8.5	6.8	5.7	4.3
.006	-	235.5	120.2	61.4	49.4	41.4	31.3	28.0	25.2	21.1	17.0	16.0	14.7	12.9	10.4	8.7	6.6
.006	-	265.9	135.7	69.3	55.8	46.8	35.4	31.6	28.5	23.9	19.2	18.1	16.6	14.5	11.7	9.8	7.4
.007	-	331.8	169.4	86.5	69.6	58.4	44.1	39.4	35.6	29.8	24.0	22.5	20.7	18.2	14.6	12.2	9.3
.008	-	-	206.5	105.4	84.9	71.1	53.8	48.0	43.3	36.3	29.2	27.5	25.2	22.1	17.8	14.9	11.3
.009	-	-	247.0	126.1	101.6	85.1	64.4	57.4	51.8	43.4	35.0	32.9	30.1	26.5	21.3	17.9	13.5
.010	-	-	314.1	160.4	129.2	108.2	81.9	73.0	65.9	55.2	44.5	41.8	38.3	33.7	27.1	22.7	17.2
.011	-	-	363.0	185.3	149.3	125.1	94.6	84.4	76.2	63.8	51.4	48.3	44.3	38.9	31.3	26.3	19.9
.012	-	-	442.6	225.9	182.0	152.5	115.3	102.9	92.9	77.8	62.7	58.9	54.0	47.4	38.2	32.0	24.2
.013	-	-	499.6	255.1	205.4	172.1	130.2	116.2	104.9	87.9	70.8	66.5	60.9	53.5	43.1	36.1	27.3
.014	-	-	591.3	301.9	243.1	203.7	154.1	137.5	124.1	104.0	83.8	78.7	72.1	63.4	51.0	42.8	32.3
.015	-	-	656.4	335.1	269.9	226.1	171.1	152.6	137.8	115.4	93.0	87.3	80.1	70.3	56.6	47.5	35.9
.016	-	-	-	388.0	312.5	261.8	198.1	176.7	159.5	133.7	107.7	101.1	92.7	81.4	65.6	55.0	41.6
.018	-	-	-	484.2	390.0	326.7	247.2	220.5	199.1	166.8	134.3	126.2	115.7	101.6	81.8	68.6	51.9
.020	-	-	-	590.3	475.4	398.3	301.3	268.8	242.7	203.3	163.8	153.8	141.0	123.9	99.8	83.6	63.2
.022	-	-	-	706.1	568.7	476.5	360.5	321.5	290.3	243.2	195.9	184.0	168.7	148.2	119.4	100.0	75.7
.024	-	-	-	831.6	669.7	561.2	424.5	378.7	341.9	286.5	230.7	216.7	198.7	174.5	140.6	117.8	89.1
.025	-	-	-	966.6	778.5	652.3	493.5	440.2	397.4	333.0	268.2	251.9	230.9	202.9	163.4	136.9	103.6
.027	-	-	-	1111.1	894.9	749.8	567.2	506.0	456.8	382.8	308.3	289.6	265.5	233.2	187.8	157.4	119.1
.029	-	-	-	1265.0	1018.8	853.7	645.8	576.1	520.1	435.8	351.0	329.7	302.2	265.5	213.8	179.2	135.5
.031	-	-	-	-	1150.2	963.8	729.1	650.4	587.2	492.0	396.3	372.2	341.2	299.8	241.4	202.3	153.0
.033	-	-	-	-	1289.1	1080.1	817.1	728.9	658.1	551.4	444.1	417.1	382.4	336.0	270.6	226.7	171.5
.035	-	-	-	-	1435.3	1202.7	909.8	811.6	732.7	614.0	494.5	464.5	425.8	374.1	301.3	252.4	191.0
.037	-	-	-	-	1588.9	1331.3	1007.2	898.4	811.1	679.7	547.4	514.2	471.4	414.1	333.5	279.4	211.4
.039	-	-	-	-	-	1466.1	1109.1	989.4	893.3	748.5	602.8	566.2	519.1	456.0	367.3	307.7	232.8
.047	-	-	-	-	-	-	1562.6	1393.9	1258.5	1054.5	849.2	797.7	731.3	642.4	517.4	433.5	328.0

SURFACE ROUGHNESS CONVERSION CHART

R_a (micrometers)	R_a (microinches)	RMS	CLA (N)	R_{max}	R_a (micrometers)	R_a (microinches)	RMS	CLA (N)	R_{max}
0.025	1	1. 1	1	0.3	1.6	63	64.3	63	8.0
0.05	2	2.2	2	0.5	3.2	125	137.5	125	13
0.1	4	4.4	4	0.8	6.3	250	275	250	25
0.2	8	8.8	8	1.2	12.5	500	550	500	50
0.4	16	17.6	16	2.0	25.0	1000	11 00	1000	100
0.8	32	32.5	32	4.0	50.0	2000	2200	2000	200

R_a = Roughness Average in micrometers or microinches.
RMS = Root Mean Square in microinches.
CLA = Center Line Average in microinches.
R_{max} = Roughness T otal in microns

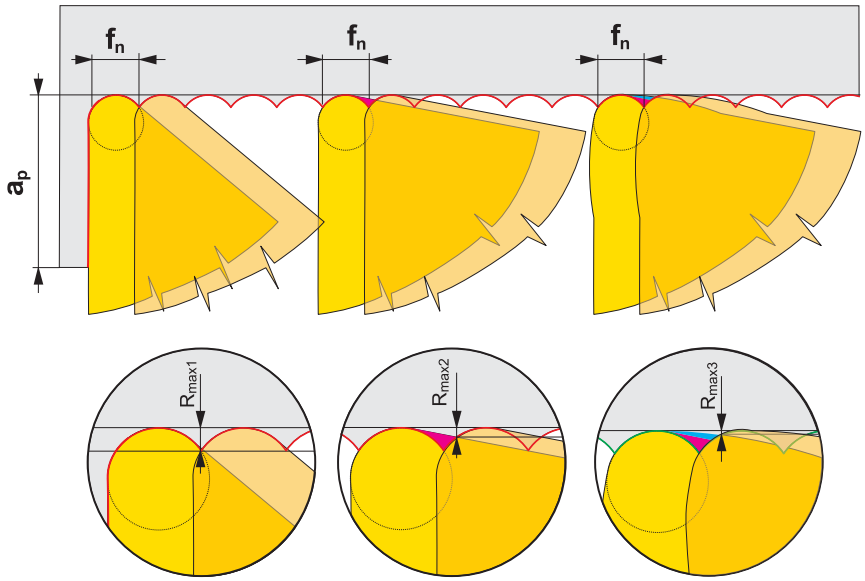
PRAMET

$$R_z = 127000 \cdot \frac{f^2}{r_\varepsilon} \quad [\mu in]$$

Table 8b

Feed f [in/rev]	r_ε Radius [in]																
	.004	.008	.016	.031	.039	.047	.063	.071	.078	.094	.118	.125	.137	.157	.196	.235	.314
	Surface R_z [µin]																
.002	124.5	62.3	31.1	15.6	12.5	10.4	7.8	6.9	6.2	5.2	4.2	3.9	3.6	3.1	2.5	2.1	1.6
.003	244.0	122.0	61.0	30.5	24.4	20.3	15.3	13.6	12.2	10.2	8.1	7.6	7.0	6.1	4.9	4.1	3.1
.003	318.7	159.4	79.7	39.8	31.9	26.6	19.9	17.7	15.9	13.3	10.6	10.0	9.1	8.0	6.4	5.3	4.0
.004	-	249.0	124.5	62.3	49.8	41.5	31.1	27.7	24.9	20.8	16.6	15.6	14.2	12.5	10.0	8.3	6.2
.005	-	358.6	179.3	89.6	71.7	59.8	44.8	39.8	35.9	29.9	23.9	22.4	20.5	17.9	14.3	12.0	9.0
.006	-	560.3	280.1	140.1	112.1	93.4	70.0	62.3	56.0	46.7	37.4	35.0	32.0	28.0	22.4	18.7	14.0
.006	-	637.5	318.7	159.4	127.5	106.2	79.7	70.8	63.7	53.1	42.5	39.8	36.4	31.9	25.5	21.2	15.9
.007	-	806.8	403.4	201.7	161.4	134.5	100.9	89.6	80.7	67.2	53.8	50.4	46.1	40.3	32.3	26.9	20.2
.008	-	-	498.0	249.0	199.2	166.0	124.5	110.7	99.6	83.0	66.4	62.3	56.9	49.8	39.8	33.2	24.9
.009	-	-	602.6	301.3	241.1	200.9	150.7	133.9	120.5	100.4	80.4	75.3	68.9	60.3	48.2	40.2	30.1
.010	-	-	778.2	389.1	311.3	259.4	194.5	172.9	155.6	129.7	103.8	97.3	88.9	77.8	62.3	51.9	38.9
.011	-	-	907.7	453.8	363.1	302.6	226.9	201.7	181.5	151.3	121.0	113.5	103.7	90.8	72.6	60.5	45.4
.012	-	-	1120.6	560.3	448.2	373.5	280.1	249.0	224.1	186.8	149.4	140.1	128.1	112.1	89.6	74.7	56.0
.013	-	-	1275.0	637.5	510.0	425.0	318.7	283.3	255.0	212.5	170.0	159.4	145.7	127.5	102.0	85.0	63.7
.014	-	-	1525.2	762.6	610.1	508.4	381.3	338.9	305.0	254.2	203.4	190.7	174.3	152.5	122.0	101.7	76.3
.015	-	-	1704.5	852.3	681.8	568.2	426.1	378.8	340.9	284.1	227.3	213.1	194.8	170.5	136.4	113.6	85.2
.016	-	-	-	996.1	796.9	664.1	498.0	442.7	398.4	332.0	265.6	249.0	227.7	199.2	159.4	132.8	99.6
.018	-	-	-	1260.7	1008.5	840.4	630.3	560.3	504.3	420.2	336.2	315.2	288.2	252.1	201.7	168.1	126.1
.020	-	-	-	1556.4	1245.1	1037.6	778.2	691.7	622.5	518.8	415.0	389.1	355.7	311.3	249.0	207.5	155.6
.022	-	-	-	1883.2	1506.6	1255.5	941.6	837.0	753.3	627.7	502.2	470.8	430.4	376.6	301.3	251.1	188.3
.024	-	-	-	2241.2	1792.9	1494.1	1120.6	996.1	896.5	747.1	597.6	560.3	512.3	448.2	358.6	298.8	224.1
.025	-	-	-	2630.3	2104.2	1753.5	1315.1	1169.0	1052.1	876.8	701.4	657.6	601.2	526.1	420.8	350.7	263.0
.027	-	-	-	3050.5	2440.4	2033.7	1525.2	1355.8	1220.2	1016.8	813.5	762.6	697.3	610.1	488.1	406.7	305.0
.029	-	-	-	3501.8	2801.5	2334.6	1750.9	1556.4	1400.7	1167.3	933.8	875.5	800.4	700.4	560.3	466.9	350.2
.031	-	-	-	-	3187.5	2656.2	1992.2	1770.8	1593.7	1328.1	1062.5	996.1	910.7	796.9	637.5	531.2	398.4
.033	-	-	-	-	3598.3	2998.6	2249.0	1999.1	1799.2	1499.3	1199.4	1124.5	1028.1	899.6	719.7	599.7	449.8
.035	-	-	-	-	4034.1	3361.8	2521.3	2241.2	2017.1	1680.9	1344.7	1260.7	1152.6	1008.5	806.8	672.4	504.3
.037	-	-	-	-	4494.8	3745.7	2809.3	2497.1	2247.4	1872.8	1498.3	1404.6	1284.2	1123.7	899.0	749.1	561.9
.039	-	-	-	-	-	4150.3	3112.7	2766.9	2490.2	2075.2	1660.1	1556.4	1423.0	1245.1	996.1	830.1	622.5
.047	-	-	-	-	-	-	4482.4	3984.3	3585.9	2988.2	2390.6	2241.2	2049.1	1792.9	1434.4	1195.3	896.5
.059	-	-	-	-	-	-	7003.7	6225.5	5602.9	4669.1	3735.3	3501.8	3201.7	2801.5	2241.2	1867.6	1400.7
.071	-	-	-	-	-	-	-	-	8068.2	6723.5	5378.8	5042.6	4610.4	4034.1	3227.3	2689.4	2017.1
.078	-	-	-	-	-	-	-	-	-	8300.7	6640.5	6225.5	5691.9	4980.4	3984.3	3320.3	2490.2
.086	-	-	-	-	-	-	-	-	-	10043.8	8035.0	7532.8	6887.2	6026.3	4821.0	4017.5	3013.1
.098	-	-	-	-	-	-	-	-	-	-	10375.8	9727.3	8893.6	7781.9	6225.5	5187.9	3890.9

Values of surface finish R_a stated in this table apply for turning by cutting indexable inserts with bigger setting angles of minor cutting edge κ_r' (inserts shapes **T..., S..., D...., K..., V...**). The surface finish Ra is better than values mentioned in table at turning by cutting inserts shapes **C..., W...** and primarily by inserts with WIPER geometry (tools with setting angle $\kappa_r = 90 \div 95°$). The reason is the low value of setting angles of minor cutting edge κ_r'. In this case the value of max. height of profile Rmax is reduced to $R_{max3} < R_{max2} < R_{max1}$ as you can see on following picture.



The position and orientation of the cutting edge in relation to the workpiece and it's geometric shape determine the cutting angle characteristics.

The angles on the cutting edge are determined on two coordinate systems:

a) tool

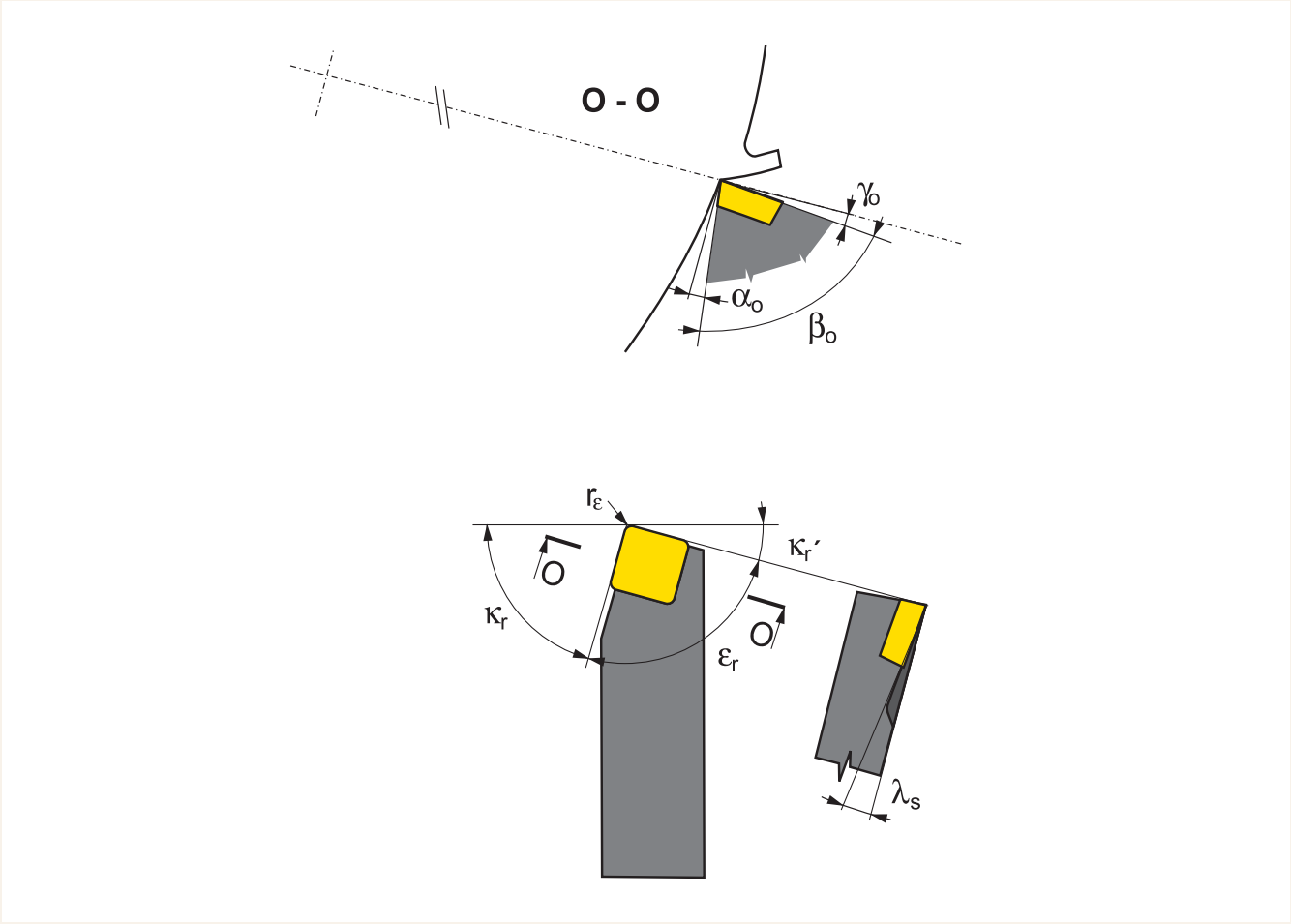
b) working

a) tool coordinate system (stationary), which is used to determine the cutting edge geometry during design, production and checking. All angles defined in this system are called tool cutting angles. All angles defined by ISO standards according to the insert shape belong in this group.

b) working coordinate system, used to determine the cutting edge geometry during the machining process. These angles are called working angles and they depend on the position of the insert clamped into the tool holder.

For example, the cutting insert SNUN ..... has a tool clearance angle $\alpha = 0°$ and a rake angle $\gamma = 0°$, however the insert is clamped in the tool holder to give a working clearance angle $\alpha_o = 6°$ and a working rake angle $\gamma_o = -6°$.

The working angles affect the tool angles with pre-formed chip formers. However the most important are the working angles for the cutting process.



The basic tool angles are indicated in the picture in the basic tool plane (interlaid by the bearing surface of the tool holder) and in the normal tool plane (interlaid across to cutting edge – cut 0-0).

We speak about the following angles:

The rake angle γ_0 – substantially affects the cutting process. Its size determines the progress and the intensity of plastic deformation during chip forming; it also determines the value of the cutting forces and the thermal stress on the cutting edge. The range of rake angles is wide, from $\gamma_0 = +25°$ to -15° for cutting tools with indexable cutting inserts for milling and turning. A positive rake angle improves the chip forming conditions, reduces the cutting forces and reduces the cutting temperature level. A negative rake angle improves the strength of the cutting edge, however it increases plastic deformation during chip forming and thereby also the cutting forces and temperatures.

Clearance angle α_0 affects the value of friction between the flank and the machined surface. Increasing the clearance angle αo reduces this friction and thereby flank wear as well.

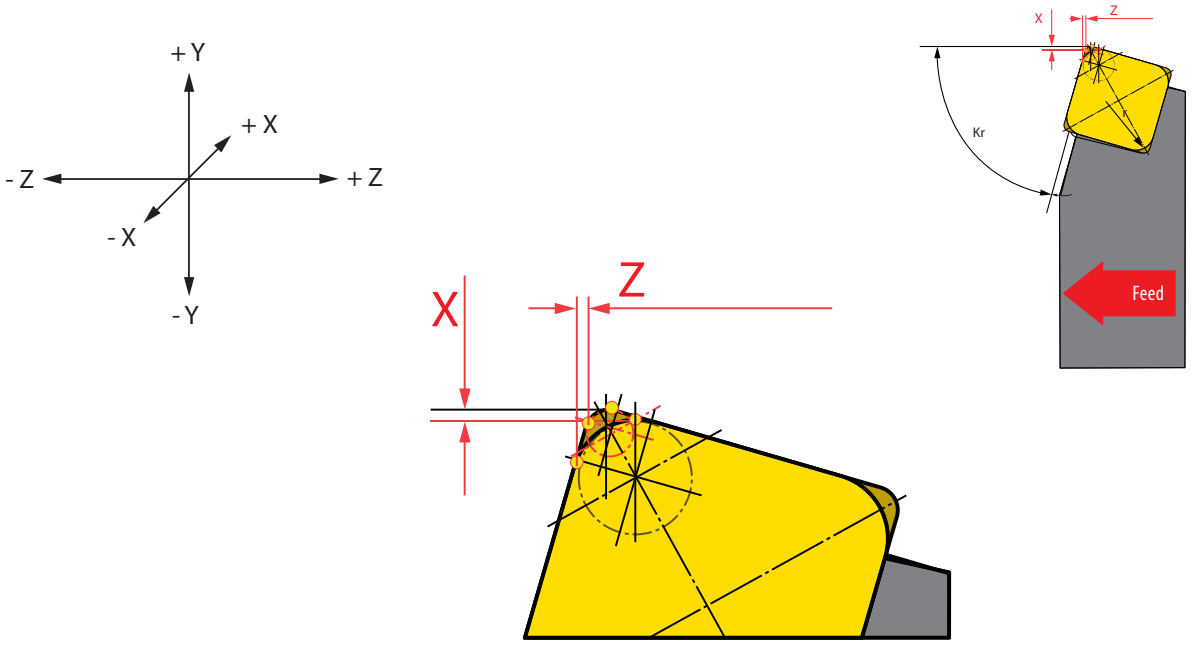
Wedge angle β_0 is the angle of the cutting insert's wedge. Increasing angle β_0 increases the strength of the cutting edge (resistance against shock), however it also increases the cutting resistance.

Inclination angle of main cutting edge λ_s – determines the point of first contact between the cutting edge and the workpiece, which is important for interrupted cut. If λ_s is positive, the point of contact is close to the nose of the cutting insert. The negative angle λ_s moves the point of first contact far from the nose and thereby affects the resistance of the cutting edge against mechanical stress. Furthermore, λ_s affects the direction of chip evacuation. If λ_s is negative, the direction of chip evacuation is towards the machined surface. Whereas if λ_s is positive, the direction of chip evacuation is away from the machined surface.

Setting angle of main cutting edge κ_r affects the shape of the chip cross-section. Reducing angle κr makes the chip thinner at a given feed f and depth of cut a_p . Whereas if $\kappa_r = 90°$ the chip thickness $h = f$ and the chip width $b = a_p$ becomes wider.

Setting angle of minor cutting edge κ_r together with nose radius r_ε define the final surface quality.

Correction of X and Z coordinate by radius and holder:



ATTENTION - the data is valid for the right-hand holders oriented as shown in picture 14. For internal holders, left-hand holders or other orientations it is necessary to correct or mark +/- (to substitute values X/Z)

	holder	coordinates	radius 1/124" .008	radius 1/64" .016	radius 1/32" .031	radius 3/64" .047	radius 1/16" .063	radius 3/32" .094	radius 1/8" .125
External tools	DCLNR/L	X	.00236	.00157	.00000	-.00157	-.00315	-.00630	-.00945
		Z	-.00244	-.00165	.00000	.00165	.00327	.00654	.00980
	DCKNR/L	X	.00673	.00453	.00000	-.00433	-.00878	-.01764	-.02646
		Z	.02697	.01799	.00000	-.01799	-.03598	-.07193	-.10791
	DCRNR/L	X	.00177	.00130	.00000	-.00063	-.00157	-.00346	-.00539
		Z	.00504	.00327	.00000	-.00378	-.00728	-.01433	-.02138
	DDJNR/L	X	.02031	.01366	.00000	-.01295	-.02626	-.05287	-.07949
		Z	-.00220	-.00161	.00000	.00087	.00213	.00461	.00709
	DDPNR/L	X	.02752	.01846	.00000	-.01783	-.03602	-.07232	-.10862
		Z	.02063	.01370	.00000	-.01406	-.02795	-.05571	-.08346
	DSDNN	X	.00992	.00669	.00000	-.00622	-.01268	-.02555	-.03846
		Z	.01661	.01102	.00000	-.01122	-.02236	-.04465	-.06689
	DSKNR/L	X	.00551	.00370	.00000	-.00354	-.00598	-.01441	-.02165
		Z	.02260	.01508	.00000	-.01512	-.03020	-.06035	-.09055
	DSRNR/L	X	.00992	.00669	.00000	-.00622	-.01268	-.02555	-.03846
		Z	.01661	.01102	.00000	-.01122	-.02236	-.04465	-.06693
	DSSNR/L	X	.00969	.00646	.00000	-.00646	-.01291	-.02583	-.03870
		Z	.01669	.01114	.00000	-.01114	-.02228	-.04453	-.06681
	DTGNR/L	X	.01720	.01157	.00000	-.01091	-.02213	-.04461	-.06705
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	DTTNR/L	X	.02366	.01587	.00000	-.01531	-.03087	-.06201	-.09319
		Z	.02043	.01358	.00000	-.01394	-.02768	-.05516	-.08264

CORRECTION OF X AND Z COORDINATE BY RADIUS AND HOLDER

	holder	coordinates	radius 1/124" .008	radius 1/64" .016	radius 1/32" .031	radius 3/64" .047	radius 1/16" .063	radius 3/32" .094	radius 1/8" .125
External tools	DVJNR/L	X	.04972	.03335	.00000	-.03224	-.06500	-.13059	-.19614
		Z	-.00295	-.00217	.00000	.00098	.00256	.00575	.00890
	DWLNR/L	X	.00240	.00173	.00000	-.00102	-.00240	-.00516	-.00787
		Z	-.00248	-.00177	.00000	.00106	.00244	.00528	.00811
Internal tools	DCLNR/L	X	.00236	.00157	.00000	-.00157	-.00315	-.00630	-.00945
		Z	-.00244	-.00165	.00000	.00165	.00327	.00654	.00980
	DDUNR/L	X	-.01969	-.01335	.00000	.01201	.02469	.05004	.07539
		Z	-.00205	-.00157	.00000	.00024	.00114	.00299	.00480
	DTFNR/L	X	-.01673	-.01138	.00000	.01000	.02071	.04209	.06350
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	DWLNR/L	X	-.00236	-.00181	.00000	.00047	.00169	.00386	.00614
		Z	-.00256	-.00193	.00000	.00047	.00157	.00413	.00654
External tools	SCLCR/L	X	.00236	.00157	.00000	-.00157	-.00315	-.00630	-.00945
		Z	-.00244	-.00165	.00000	.00165	.00327	.00654	.00980
	SDJCR/L	X	.02047	.01362	.00000	-.01362	-.02728	-.05457	-.08181
		Z	-.00236	-.00157	.00000	.00157	.00315	.00634	.00949
	SDPCN	X	.02752	.01835	.00000	-.01835	-.03673	-.07343	-.11016
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	SSDCN	X	.00980	.00654	.00000	-.00654	-.01303	-.02610	-.03913
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	STGCR/L	X	.01598	.01067	.00000	-.01067	-.02134	-.04268	-.06402
		Z	-.00213	-.00142	.00000	.00142	.00280	.00563	-.00843
	SVHBR/L	X	.04071	.02717	.00000	-.02717	-.05429	-.10862	-.16291
		Z	-.02142	-.01429	.00000	.01429	.02858	.05717	.08575
	SVJBR/L	X	.04996	.03331	.00000	-.03331	-.06661	-.13323	-.19984
		Z	-.00390	-.00260	.00000	.00260	.00520	.01035	.01555
	SVVBN	X	.05492	.03661	.00000	-.03661	-.07323	-.14650	-.21972
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	SWLCR/L	X	.00236	.00157	.00000	-.00157	-.00315	-.00630	-.00945
		Z	-.00236	-.00157	.00000	.00157	.00315	.00630	.00945
Internal tools	SCLCR/L	X	-.00228	-.00154	.00000	.00154	.00307	.00610	.00917
		Z	-.00244	-.00165	.00000	.00165	.00327	.00654	.00980
	SDQCR/L	X	-.01217	-.00764	.00000	.00811	.01622	.03248	.04870
		Z	-.01220	-.00811	.00000	.01055	.01965	.03783	.05602
	SDUCR/L	X	-.01984	-.01323	.00000	.01323	.02646	.05291	.07937
		Z	-.00232	-.00154	.00000	.00161	.00323	.00638	.00953
	SDZCR/L	X	-.02047	-.01362	.00000	.01362	.02728	.00547	.08181
		Z	.00232	.00154	.00000	-.00161	-.00323	-.00638	-.00953
	STFCR/L	X	-.01705	-.01138	.00000	.01138	.02272	.04543	.06815
		Z	.00000	.00000	.00000	.00000	.00000	.00000	.00000
	SVQBR/L	X	-.04043	-.02693	.00000	.02717	.05390	.10780	.16165
		Z	-.02146	-.01429	.00000	.01429	.02858	.05717	.08575
	SVUBR/L	X	-.04957	-.03307	.00000	.03307	.06610	.13220	.19831
		Z	.00390	-.00260	.00000	.00260	.00520	.01035	.01555
	SWLCR/L	X	-.00236	-.00154	.00000	.00154	.00311	.00622	.00933
		Z	-.00236	-.00157	.00000	.00157	.00315	.00630	.00945

ATTENTION - the data is valid for the right-hand holders oriented as shown in picture 14. For internal holders, left-hand holders or other orientations it is necessary to correct or mark +/- (to substitute values X/Z)

The choice of production method is influenced by the workpiece and the machine. Workpiece – external or internal thread, right- or left-hand thread. Machine – right- or left-hand tool. You can use the following tables 9a and 9b.

Table 9a

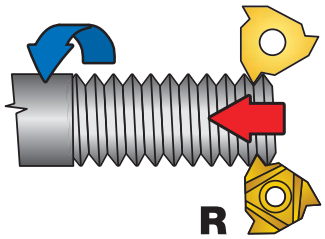
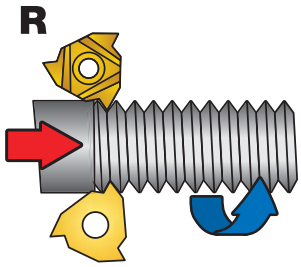
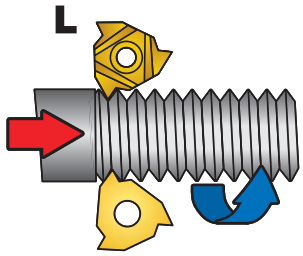
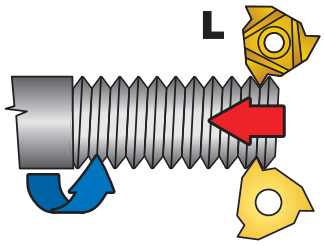
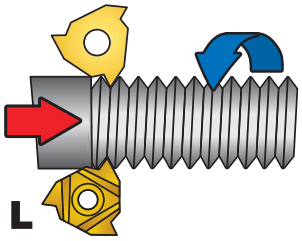
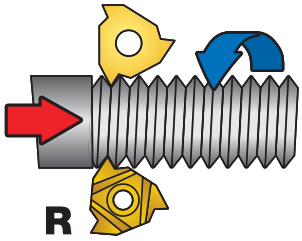
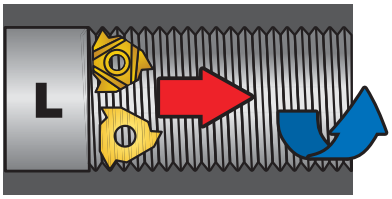
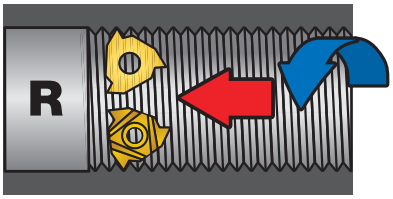
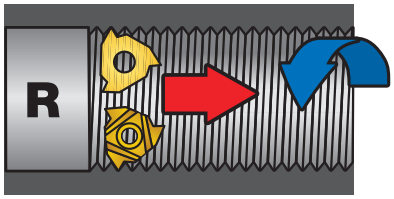
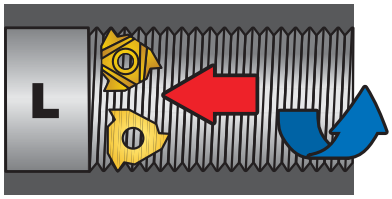
EXTERNAL THREAD, RIGHT-HAND		
		
EXTERNAL THREAD, LEFT-HAND		
		
movement of the workpiece	*tool movement*	**L / R** - *Dinsert design*

Table 9b

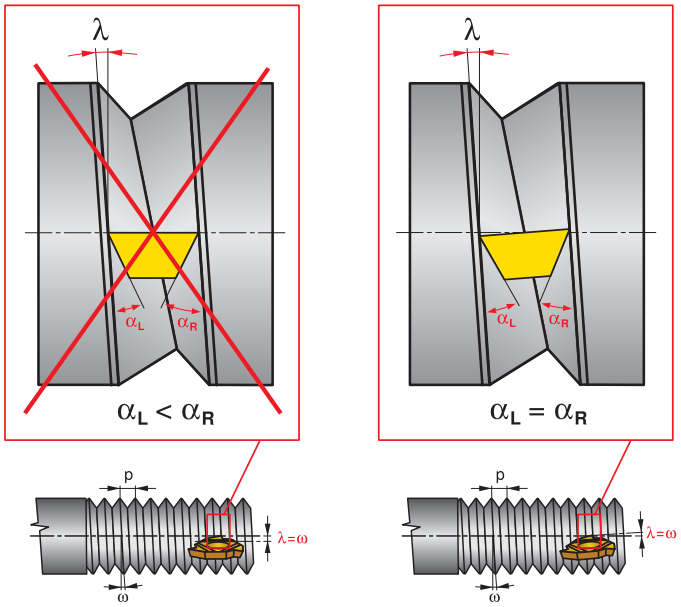
INTERNAL THREAD, RIGHT-HAND	
	
INTERNAL THREAD, LEFT-HAND	
	
movement of the workpiece	*tool movement*

L / R - *Dinsert design*

The following formula can be used to calculate the helix angle:

$$tg\ \omega = \frac{p}{d_s \cdot \pi}$$

ω	*helix angle*	*[°]*
p	*pitch*	*[in]*
d_s	*pitch diameter*	*[in]*



To generate the correct shape on the thread and uniform wear on the insert, the cutting edge helix angle should be equal to the thread lead angle.

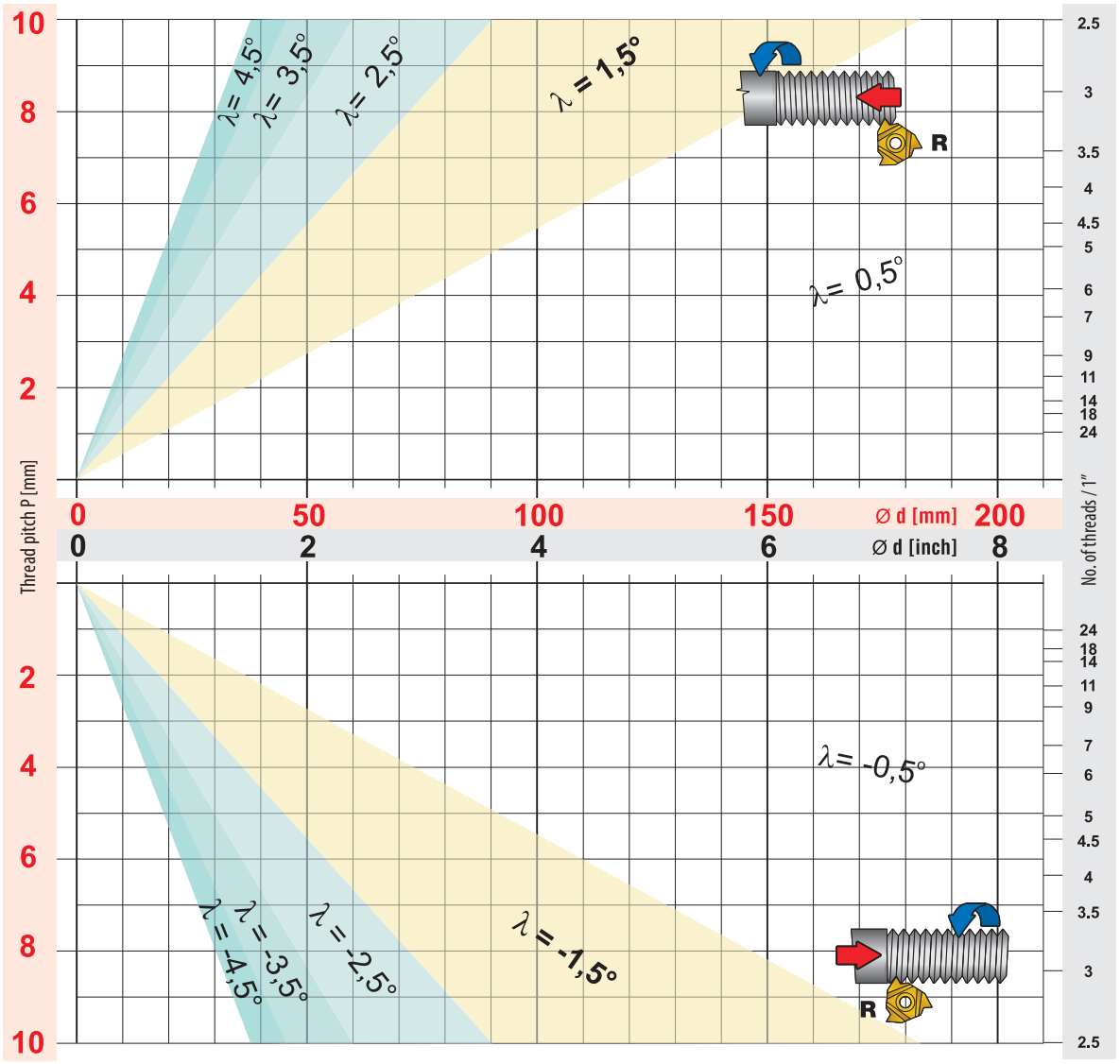
The tool holders are usually supplied with a helix angle λ = 1.5°. A different helix angle can be selected by changing the anvil.

Use the graph or table below to choose the correct anvil.

Helix angle λ	Positive					Negative		for grooving inserts TN16.. ... ZZ, TN 22...ZZ
	4.5°	3.5°	2.5°	**1.5°**	.5°	-.5°	-1.5°	
Tool holder	Anvil specification							
SER .... .16; SIL .... .16	PE16+4.5	PE16+3.5	PE16+2.5	PE16+1.5	PE16+.5	PE16-.5	PE16-1.5	PE16 ZZ
SEL .... .16; SIR .... .16	PI16+4.5	PI16+3.5	PI16+2.5	PI16+1.5	PI16+.5	PI16-.5	PI16-1.5	PI16 ZZ
SER .... .22; SIL .... .22	PE22+4.5	PE22+3.5	PE22+2.5	PE22+1.5	PE22+.5	PE22-.5	PE22-1.5	PE22 ZZ
SEL .... .22; SIR .... .22	PI22+4.5	PI22+3.5	PI22+2.5	PI22+1.5	PI22+.5	PI22-.5	PI22-1.5	PI22 ZZ
SER-S .... .22; SIL-S .... .22	PE22S+4.5	PE22S+3.5	PE22S+2.5	PE22S+1.5	PE22S+.5	PE22S-.5	PE22S-1.5	-
SEL-S .... .22; SIR-S .... .22	PI22S+4.5	PI22S+3.5	PI22S+2.5	PI22S+1.5	PI22S+.5	PI22S-.5	PI22S-1.5	-

The tool holders are usually supplied with a helix angle λ = 1.5°. A different helix angle can be selected by changing the anvil.

Shims for holders SER-S ...., SIR-S .... are marked with „S“



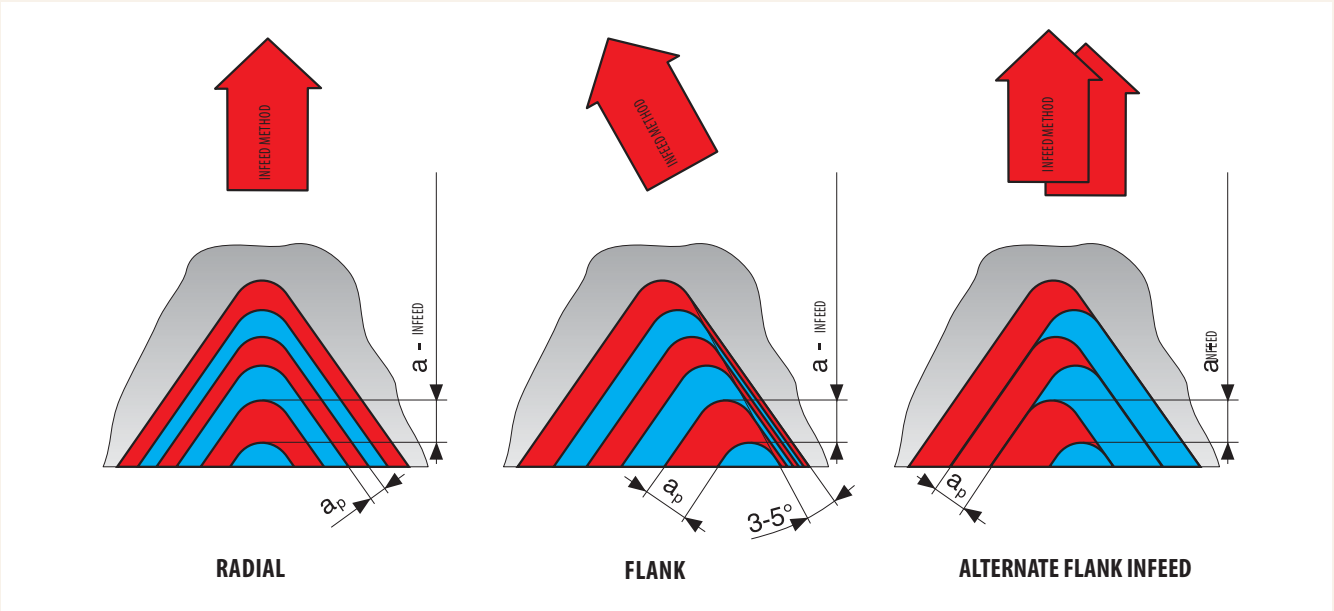
movement of the workpiece

tool movement

L / R - *Dinsert design*

Infeed method and depth

The choice of infeed method is most important for long chipping materials to ensure good chip control.



The choice depends on the machine type, the machined material and the pitch.

Radial infeed – the most simple and the most used. The infeed is perpendicular to the axis of rotation of the workpiece. It contributes to good chip formation and uniform wear on the cutting edge. Suitable for threads with a small pitch (p <1.5 mm). There is a risk of vibration at higher feeds. First choice for working on hard materials (e.g. austenitic stainless steels, steels with low carbon content).

Flank infeed – reduces thermal stress on the cutting edge and thereby wear. Good chip control. Suitable for threads with a pitch of p >1.5 mm for TR threads. Flank infeed with deviation 3-5° eliminates friction on the thread flank.

Alternate flank infeed – recommended for coarse threads and materials with poor chip formation. Long tool life. For CNC machines, higher demand on CNC programming.

Infeed method and Number of passes [in] depend on the thread pitch. The tables give basic recommendations and apply to all geometries. If the insert fractures, the infeed value should be decreased and the Number of passes [in] should be increased. The infeed depth should not be less than .05 mm/pass. On austenitic and soft steels the infeed depth per pass should be greater than .08 mm.

Tubular cylindrical thread profile corresponds with W (WHITWORTH 55°)					
Thread marking	No. of threads /1"	Thread pitch [in]	Nominal diameter of thread [in]	Small diameter of thread [in]	Thread insert marknig
G 1/16″	28	.0357	.304	.258	**TN xxxx280W**
G 1/8″			.383	.337	
G 1/4″	19	.0526	.518	.450	**TN xxxx190W**
G 3/8″			.656	.588	
G 1/2″	14	.0714	.825	.733	**TN xxxx140W**
G 5/8″			.902	.810	
G 3/4″			1.041	.949	
G 7/8″			1.189	1.097	
G 1″	11	.0909	1.309	1.192	**TN xxxx110W**
G1 1/8″			1.492	1.376	
G1 1/4″			1.650	1.534	
G1 1/2″			1.882	1.767	
G1 3/4″			2.216	1.999	
G 2″			2.347	2.231	
G2 1/4″			2.587	2.471	
G2 1/2″			2.960	2.844	
G2 3/4″			3.210	3.094	
G3″			3.460	3.344	
G3 1/2″			3.950	3.834	
G4″			4.450	4.334	
G4 1/2″			4.950	4.834	
G5″			5.450	5.334	
G5 1/2″			5.950	5.834	
G6″			6.450	6.334	

Example: for right external thread on tube 1 1/2" use thread insert TN 16ER110W; 8030

M - Metric 60° - external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH														
	Pitch [mm]														
	6.0	5.5	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.75	1.5	1.25	1.0	0.75	0.50
1	.018	.017	.016	.015	.003	.013	.011	.011	.009	.008	.008	.008	.008	.006	.005
2	.017	.016	.015	.013	.013	.012	.010	.009	.009	.008	.008	.007	.006	.006	.004
3	.014	.013	.013	.011	.010	.010	.008	.008	.007	.007	.007	.006	.005	.004	.003
4	.012	.011	.011	.009	.009	.008	.007	.007	.006	.006	.006	.004	.004	.003	.002
5	.011	.010	.010	.009	.008	.008	.007	.006	.006	.005	.005	.004	.003		
6	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.003	.003			
7	.009	.008	.009	.008	.007	.006	.006	.005	.004	.003					
8	.009	.008	.008	.007	.006	.006	.005	.004	.003	.003					
9	.009	.007	.007	.007	.006	.006	.005	.004							
10	.008	.007	.007	.006	.005	.005	.004	.003							
11	.007	.007	.006	.006	.005	.004	.004								
12	.006	.006	.006	.005	.004	.003	.003								
13	.006	.006	.005	.005	.004										
14	.006	.005	.004	.004	.003										
15	.005	.005													
16	.004	.004													
Total infeed depth [in]	.151	.139	.126	.113	.100	.088	.076	.063	.049	.044	.037	.032	.026	.019	.014

M - Metric 60° - internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH														
	Pitch [mm]														
	6.0	5.5	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.75	1.5	1.25	1.0	0.75	0.50
1	.018	.017	.017	.015	.013	.013	.011	.010	.009	.009	.008	.007	.007	.006	.004
2	.017	.016	.016	.013	.012	.012	.010	.010	.008	.007	.007	.007	.006	.005	.003
3	.014	.013	.013	.011	.009	.009	.008	.007	.007	.006	.006	.006	.004	.004	.003
4	.012	.010	.010	.009	.008	.007	.006	.006	.006	.005	.005	.004	.004	.003	.002
5	.010	.009	.009	.008	.007	.007	.006	.005	.005	.004	.004	.003	.003		
6	.009	.008	.008	.007	.007	.006	.005	.005	.004	.004	.003	.003			
7	.008	.007	.007	.006	.006	.006	.005	.004	.003	.003					
8	.007	.006	.006	.006	.005	.005	.004	.004	.003	.003					
9	.007	.006	.006	.006	.005	.005	.004	.004							
10	.006	.006	.006	.005	.005	.004	.004	.003							
11	.006	.006	.005	.005	.004	.004	.004								
12	.006	.006	.005	.005	.004	.003	.003								
13	.005	.005	.005	.004	.004										
14	.005	.005	.004	.004	.003										
15	.005	.004													
16	.004	.004													
Total infeed depth [in]	.139	.128	.117	.104	.092	.081	.070	.058	.045	.041	.033	.030	.024	.018	.012

W - Whitworth 55° - external and internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH																
	Pitch [TPI]																
	4	4.5	5	6	7	8	9	10	11	12	14	16	18	19	20	26	28
1	.019	.018	.018	.015	.015	.013	.012	.011	.011	.011	.009	.009	.009	.009	.008	.007	.007
2	.018	.017	.017	.014	.014	.011	.011	.010	.010	.010	.009	.009	.009	.008	.008	.007	.006
3	.015	.015	.015	.012	.012	.009	.009	.009	.009	.009	.007	.008	.008	.007	.007	.006	.006
4	.014	.013	.013	.010	.010	.008	.008	.007	.007	.007	.006	.006	.006	.006	.006	.005	.005
5	.013	.011	.011	.009	.009	.007	.007	.007	.006	.006	.005	.005	.005	.005	.004	.003	.003
6	.012	.010	.010	.008	.007	.007	.006	.006	.006	.006	.004	.004	.003	.003	.003		
7	.011	.009	.009	.007	.006	.006	.006	.006	.005	.005	.004	.003					
8	.011	.008	.008	.007	.006	.006	.005	.005	.005	.003	.003						
9	.010	.008	.007	.006	.006	.005	.005	.005	.003								
10	.009	.007	.006	.006	.005	.005	.004	.003									
11	.008	.007	.006	.006	.005	.005	.003										
12	.007	.006	.006	.005	.003	.003											
13	.007	.006	.005	.005													
14	.006	.006	.004	.004													
15	.005	.005															
16	.004	.004															
Total infeed depth [in]	.169	.150	.135	.114	.098	.085	.076	.069	.062	.057	.047	.044	.040	.038	.036	.028	.027

UN - UN 60° - external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH																	
	Pitch [TPI]																	
	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32
1	.019	.018	.017	.014	.014	.012	.011	.011	.011	.011	.010	.009	.009	.009	.008	.007	.007	.007
2	.017	.016	.016	.013	.013	.011	.010	.010	.010	.010	.009	.009	.008	.008	.007	.007	.006	.006
3	.016	.015	.014	.011	.010	.010	.008	.008	.008	.008	.007	.007	.006	.006	.006	.006	.004	.005
4	.014	.012	.012	.009	.009	.008	.007	.007	.007	.007	.007	.006	.006	.006	.005	.005	.004	.003
5	.013	.010	.010	.009	.008	.007	.007	.006	.006	.006	.006	.005	.005	.005	.004	.003	.003	
6	.011	.009	.009	.008	.007	.006	.006	.006	.006	.005	.005	.004	.004	.003	.003			
7	.010	.008	.008	.007	.007	.006	.006	.005	.005	.005	.004	.004	.003					
8	.010	.008	.008	.006	.006	.005	.005	.005	.004	.003	.003	.003						
9	.009	.007	.007	.006	.006	.005	.005	.004	.003									
10	.008	.007	.007	.006	.005	.005	.004	.003										
11	.007	.006	.007	.005	.004	.004	.003											
12	.007	.006	.006	.005	.003	.003												
13	.006	.006	.005	.004														
14	.006	.006	.004	.004														
15	.005	.005																
16	.004	.004																
Total infeed depth [in]	.162	.143	.130	.107	.092	.082	.072	.065	.060	.055	.051	.047	.041	.037	.033	.028	.024	.021

UN - UN 60° - internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH																	
	Pitch [TPI]																	
	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32
1	.017	.016	.017	.014	.013	.012	.011	.011	.011	.011	.010	.009	.009	.009	.008	.007	.007	.007
2	.016	.015	.015	.013	.013	.011	.010	.010	.009	.009	.008	.007	.007	.007	.006	.006	.005	.005
3	.015	.013	.013	.010	.009	.009	.007	.007	.007	.007	.006	.006	.006	.006	.005	.005	.004	.004
4	.013	.011	.011	.008	.008	.007	.006	.006	.006	.006	.005	.005	.005	.005	.004	.004	.003	.003
5	.011	.009	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.003	.004	.003	.003	
6	.009	.008	.008	.006	.006	.005	.005	.005	.005	.004	.004	.004	.003	.003	.003			
7	.009	.007	.007	.006	.006	.005	.005	.004	.004	.004	.004	.004	.003					
8	.008	.007	.007	.006	.005	.004	.004	.004	.004	.003	.003	.003						
9	.008	.007	.006	.005	.005	.004	.004	.004	.003									
10	.007	.006	.005	.005	.005	.004	.004	.003										
11	.007	.006	.005	.005	.004	.004	.003											
12	.006	.006	.006	.004	.003	.003												
13	.006	.006	.005	.004														
14	.006	.005	.004	.004														
15	.005	.005																
16	.004	.004																
Total infeed depth [in]	.147	.131	.118	.097	.084	.074	.065	.059	.054	.049	.045	.042	.037	.033	.030	.025	.022	.019

NPT - NPT 60° - internal and external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH				
	Pitch [TPI]				
	8	11.5	14	18	27
1	.011	.010	.009	.009	.007
2	.010	.009	.007	.007	.006
3	.009	.007	.007	.006	.005
4	.007	.006	.006	.006	.005
5	.007	.006	.006	.005	.004
6	.007	.005	.005	.004	.003
7	.007	.005	.005	.004	
8	.007	.005	.004	.003	
9	.006	.005	.004		
10	.006	.004	.003		
11	.006	.004			
12	.005	.003			
13	.005				
14	.004				
15	.003				
Total infeed depth [in]	.100	.069	.056	.044	.030

RD - RD 30° - external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH			
	Pitch [TPI]			
	4	6	8	10
1	.017	.013	.011	.010
2	.016	.012	.010	.010
3	.013	.010	.008	.009
4	.013	.009	.007	.008
5	.011	.008	.007	.006
6	.010	.008	.007	.005
7	.009	.008	.007	.004
8	.009	.006	.005	.003
9	.008	.006	.004	
10	.007	.005	.003	
11	.007	.004		
12	.006	.003		
13	.005			
14	.004			
Total infeed depth [in]	.135	.091	.068	.055

RD - RD 30° - internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH			
	Pitch [TPI]			
	4	6	8	10
1	.018	.015	.010	.011
2	.017	.013	.009	.010
3	.016	.012	.008	.010
4	.014	.010	.007	.009
5	.012	.008	.007	.007
6	.010	.007	.006	.005
7	.009	.007	.006	.004
8	.009	.006	.005	.003
9	.008	.006	.004	
10	.007	.005	.003	
11	.007	.004		
12	.006	.003		
13	.005			
14	.003			
Total infeed depth [in]	.141	.096	.065	.059

INFEED DEPTH

TR - TR 30° - external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH											
	Pitch [mm]											
	14.0	12.0	1.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.5
1	.40	.38	.38	.38	.37	.37	.37	.34	.31	.27	.25	.23
2	.37	.36	.36	.35	.35	.34	.35	.33	.28	.25	.24	.22
3	.36	.34	.34	.34	.34	.33	.32	.27	.24	.21	.20	.18
4	.36	.34	.34	.33	.33	.31	.29	.25	.20	.17	.17	.14
5	.35	.32	.32	.31	.31	.29	.27	.23	.19	.15	.14	.12
6	.35	.32	.32	.30	.29	.26	.25	.21	.18	.13	.13	.08
7	.34	.30	.31	.29	.28	.26	.23	.20	.16	.13	.11	
8	.34	.30	.29	.28	.27	.26	.22	.20	.15	.12	.09	
9	.34	.30	.28	.26	.25	.24	.22	.18	.15	.12		
10	.33	.29	.27	.25	.24	.23	.20	.16	.15	.10		
11	.33	.29	.25	.24	.23	.22	.18	.15	.14	.10		
12	.32	.29	.24	.23	.21	.22	.17	.14	.13	.08		
13	.32	.28	.23	.22	.20	.20	.17	.13	.10			
14	.31	.27	.22	.21	.19	.19	.16	.10				
15	.31	.25	.22	.21	.19	.17	.14					
16	.30	.25	.20	.19	.18	.16	.12					
17	.30	.24	.19	.18	.17	.12						
18	.29	.22	.18	.16	.15							
19	.28	.20	.17	.15	.13							
20	.27	.20	.16	.15								
21	.23	.19	.15	.13								
22	.23	.18	.15									
23	.21	.17	.13									
24	.19	.16										
25	.17	.15										
26	.16	.13										
27	.16											
28	.15											
29	.13											
Total infeed depth [in]	8.2	6.72	5.7	5.16	4.68	4.17	3.66	2.89	2.38	1.83	1.33	.97

TR - TR 30° - internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH											
	Pitch [mm]											
	14.0	12.0	1.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.5
1	.40	.38	.38	.38	.37	.37	.37	.34	.31	.27	.25	.23
2	.37	.36	.36	.35	.35	.34	.34	.33	.28	.25	.24	.22
3	.36	.34	.34	.34	.34	.33	.32	.27	.24	.22	.21	.19
4	.36	.34	.34	.33	.33	.31	.29	.25	.20	.17	.17	.14
5	.35	.32	.32	.31	.31	.29	.27	.23	.19	.15	.14	.12
6	.35	.32	.32	.31	.29	.26	.25	.21	.18	.14	.13	.08
7	.34	.30	.31	.29	.28	.26	.23	.20	.16	.13	.11	
8	.34	.30	.29	.29	.27	.26	.22	.20	.15	.12	.09	
9	.34	.30	.28	.26	.25	.24	.22	.18	.15	.12		
10	.33	.29	.27	.25	.24	.23	.20	.16	.15	.10		
11	.33	.29	.25	.24	.23	.22	.18	.15	.14	.10		
12	.32	.28	.24	.23	.21	.22	.17	.14	.13	.08		
13	.32	.28	.23	.22	.20	.20	.17	.13	.10			
14	.31	.27	.22	.21	.19	.19	.16	.10				
15	.31	.25	.22	.21	.19	.17	.14					
16	.30	.25	.20	.20	.18	.16	.12					
17	.30	.24	.19	.18	.17	.12						
18	.29	.22	.18	.16	.15							
19	.28	.20	.17	.15	.13							
20	.27	.20	.16	.15								
21	.27	.19	.15	.13								
22	.23	.18	.15									
23	.23	.17	.13									
24	.21	.16										
25	.19	.15										
26	.17	.13										
27	.16											
28	.16											
29	.15											
30	.13											
Total infeed depth [in]	8.47	6.71	5.7	5.19	4.68	4.17	3.65	2.89	2.38	1.85	1.34	.98

ACME - ACME 29° - external

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH									
	Pitch [TPI]									
	2	3	4	5	6	8	10	12	14	16
1	.028	.019	.013	.012	.011	.010	.010	.009	.008	.009
2	.026	.018	.012	.011	.011	.010	.009	.009	.008	.009
3	.023	.016	.011	.010	.010	.009	.009	.007	.007	.007
4	.022	.015	.011	.010	.009	.007	.007	.007	.006	.006
5	.019	.013	.010	.009	.008	.006	.006	.005	.005	.005
6	.017	.011	.010	.008	.007	.005	.005	.005	.004	.003
7	.015	.011	.009	.007	.006	.005	.005	.004	.003	
8	.013	.009	.008	.007	.006	.005	.004	.004		
9	.013	.009	.008	.007	.006	.005	.004			
10	.011	.009	.007	.006	.006	.004	.004			
11	.011	.008	.007	.006	.006	.004				
12	.010	.007	.006	.006	.005	.004				
13	.009	.007	.006	.005	.004					
14	.009	.007	.006	.004						
15	.008	.006	.006	.004						
16	.007	.005	.004							
17	.007	.005	.004							
18	.006	.005								
19	.006									
20	.005									
Total infeed depth [in]	.265	.180	.138	.112	.095	.074	.063	.050	.041	.039

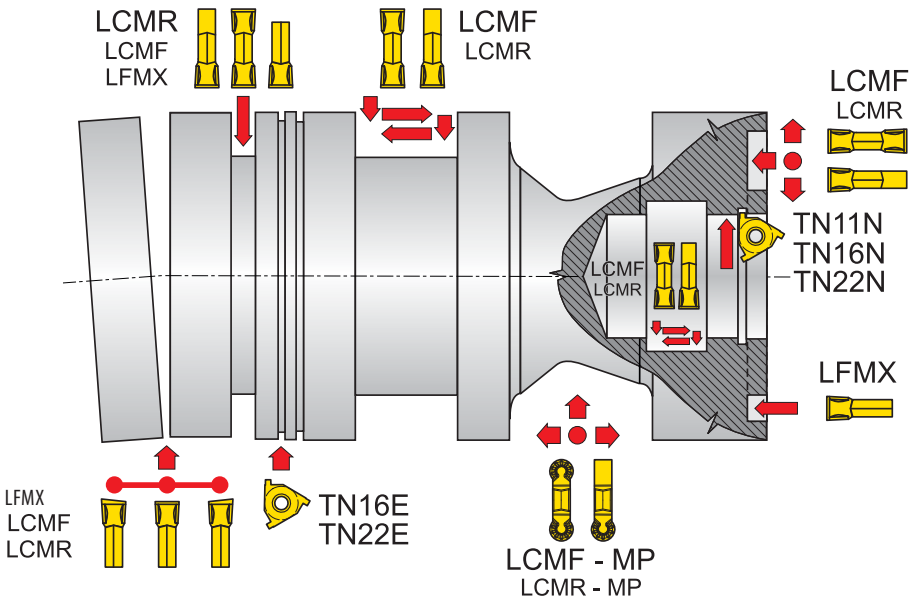
ACME - ACME 29° - internal

Number of passes	REDUCE THE CUTTING SPEED PROPORTIONALLY TO INCREASING THE THREAD PITCH									
	Pitch [TPI]									
	2	3	4	5	6	8	10	12	14	16
1	.028	.020	.013	.012	.012	.011	.010	.009	.009	.009
2	.026	.018	.012	.012	.011	.011	.010	.009	.008	.009
3	.023	.016	.012	.011	.011	.009	.009	.007	.007	.008
4	.022	.015	.011	.010	.009	.007	.007	.006	.006	.006
5	.019	.013	.011	.009	.008	.006	.006	.005	.005	.005
6	.017	.011	.010	.008	.007	.006	.006	.005	.004	.003
7	.015	.011	.009	.007	.007	.005	.005	.004	.003	
8	.013	.009	.008	.007	.006	.005	.004	.004		
9	.013	.009	.008	.007	.006	.005	.004			
10	.011	.009	.007	.006	.006	.005	.004			
11	.011	.008	.007	.006	.006	.004				
12	.010	.007	.006	.006	.005	.004				
13	.009	.007	.006	.005	.004					
14	.009	.007	.006	.004						
15	.008	.006	.006	.004						
16	.007	.006	.005							
17	.007	.005	.005							
18	.006	.005								
19	.006									
20	.005									
Total infeed depth [in]	.265	.182	.142	.114	.098	.078	.065	.049	.042	.040

Recesses, parting and copy turning.

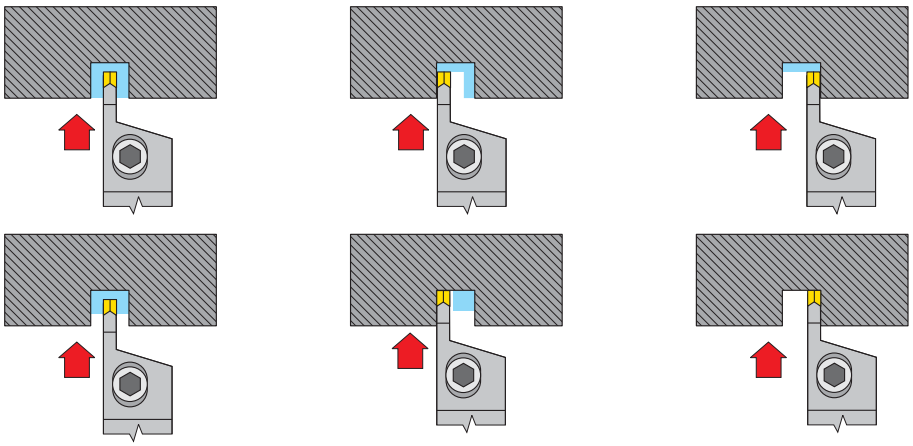
Pramet offers a comprehensive range of turning tools for turning shallow and deep recesses, both radially and axially (face grooving). Circular/copy profile turning can also be performed through side cutting.

The Pramet range of tools for recessing, grooving, profiling and parting are shown in the picture below.



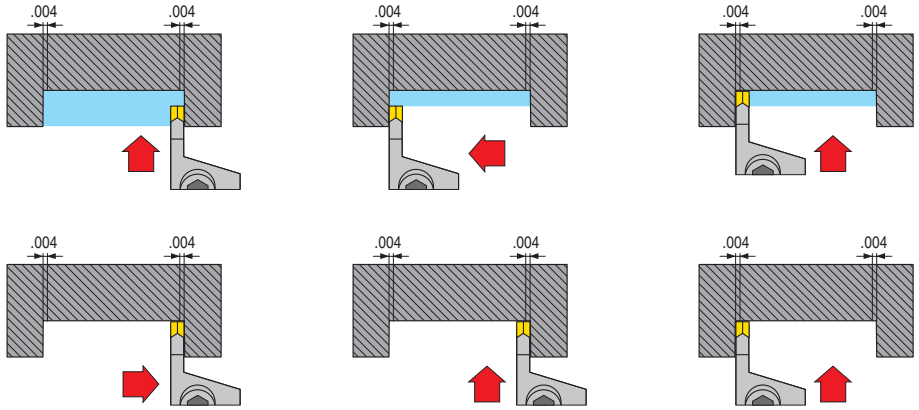
Recommendation for practical usage:

The procedure for turning a recess (deepening and widening) is shown in the next picture.

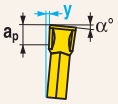


Note: To create a flat seating surface, use insert type LCMF with chip breaker F. The outboard radial grooving passes should overlap the central pass by two times the insert corner radius.

When machining a wide recess, follow the procedure shown in the following pictures.

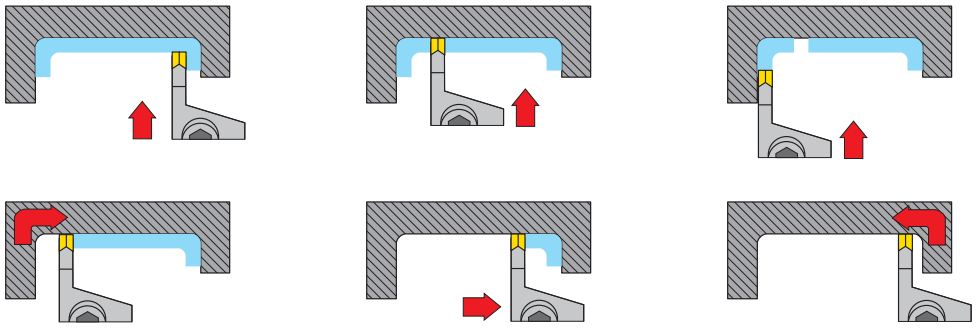


*Note: Use the cutting insert LCMF with chip breaker M. You must consider the tool's deformation "**y**":*

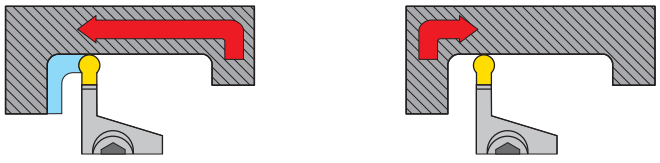


- for f =.006 in.rev^{-1};	*a_p = .118 in*	***y = .0027 in***
- for f =.010 in.rev^{-1};	*a_p = .118 in*	***y = .0031 in***
- for f =.014 in.rev^{-1};	*a_p = .118 in*	***y = .0039 in***

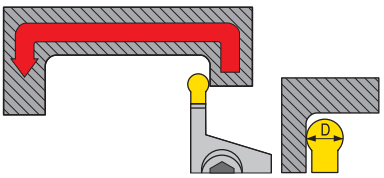
When opening up or deepening a contour using side turning, use the procedure shown in picture 21.



Roughing of contour (insert with round cutting edge)



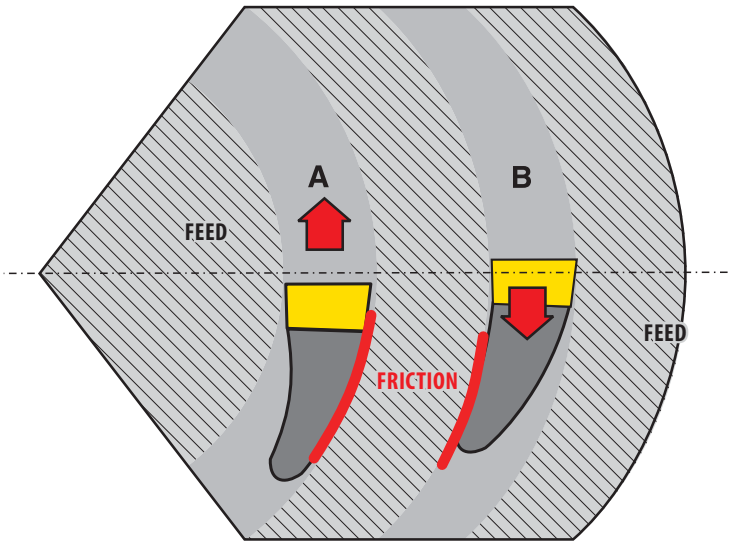
Finishing of contour (insert with round cutting edge)



D [in]	a_p [in]
.120	.006
.160	.008
.200	.009
.240	.010
.310	.016

- **When copy turning using indexable inserts with a round cutting edge, the maximum depth of cut is 40% of the diameter of the insert.**
- **Choose the tool holder with the maximum cross-section and minimum tool overhang to eliminate vibrations.**
- **The longitudinal axis of the cutting insert must be perpendicular to the axis of rotation of the workpiece (at radial recesses).**
- **The cutting edge must be on centerline within a tolerance of ± .004 in**
- **Coolant must be applied directly onto the cutting edge, and onto the support area of the tool holder under the insert cutting edge, in sufficient quantities to guarantee effective cooling of the insert.**
- When face grooving it is necessary to select a tool holder with the correct range of diameters for the groove to be machined. The tool must be set parallel to the axis of rotation of the workpiece (perpendicular to the face of the groove). Otherwise there is a risk of rubbing against the wall(s) of the groove during machining.
- In the event of the tool rubbing against the outer wall of the groove, it may be necessary to raise the cutting edge above centre (see example A in picture 18). In the event of the tool rubbing against the inner wall of the groove, it may be necessary to lower the cutting edge below center (see example A on picture below).

When face grooving, the tool must be set to be perpendicular to the face of the workpiece with high accuracy, otherwise the side of the tool will rub against the groove being created.



Using effective coolant, applied directly to the cutting edge in sufficient quantities, is very important. Cooling reduces the temperature of the cutting edge and also the lower part of the tool holder, in which the cutting insert is seated.

In both cases it is necessary to take into consideration vibrations on the machine/tool/workpiece when selecting cutting speeds, feeds and insert geometries.

Vibrations negatively affect the wear on the cutting edge, the quality of the machined surface and the final precision of the workpiece.

The primary cause of vibrations is a reduction in the rigidity of one of the elements in the system - this is mainly due to the slenderness of the machined shaft in external turning and a lower rigidity of the tool holder (boring bar) in internal turning.

The degree of slenderness of the shaft is defined as the ratio between the length of the shaft L and its diameter.

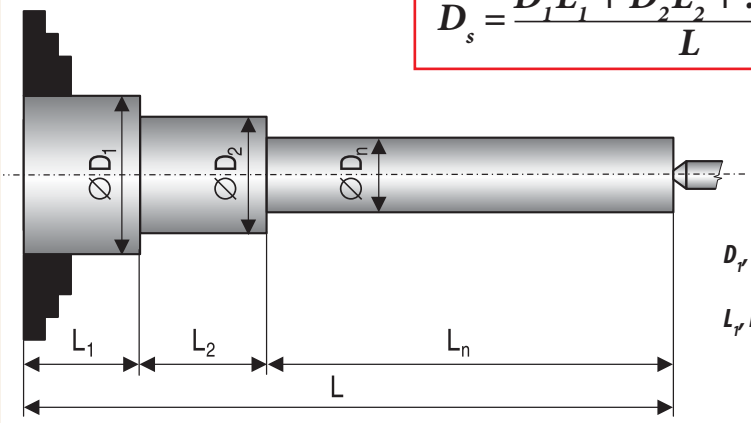
$$\lambda = \frac{L}{D}$$

λ	*degree of slenderness*	
L	*length of shaft*	*[in]*
D	*diameter of shaft*	*[in]*

We often have to machine shafts with different diameters on different stepped lengths, see picture.

In these situations, we determine the the degree of slenderness by calculating from the median diameter of the shaft (see picture below).

$$D_s = \frac{D_1 L_1 + D_2 L_2 + \ldots . D_n L_n}{L}$$



D_1, D_2, D_n ..... *Diameters of stepped parts of shaft [in]*

L_1, L_2, L_n ..... *Length of stepped parts [in]*

Reduced degree of slenderness λ_{red} is defined as the ratio

$$\lambda_{red} = \frac{L}{D_s}$$

For internal turning, the rigidity of the tool holder depends on the length of protrusion.

$$\lambda = \frac{L}{D}$$

In this case, „L" represents the length of protrusion of the tool holder and „D" the diameter.

During turning deflection of the workpiece occurs due to cutting forces , the vibrations originate mainly from the deformation of the workpiece in the radial direction.

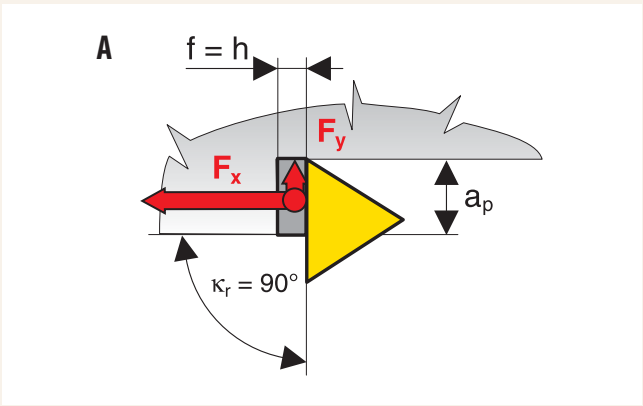
Vibrations increase when the deformation reaches a specific limit. There are many articles on vibration in technical literature, which describe how vibrations increase in a more detailed way.

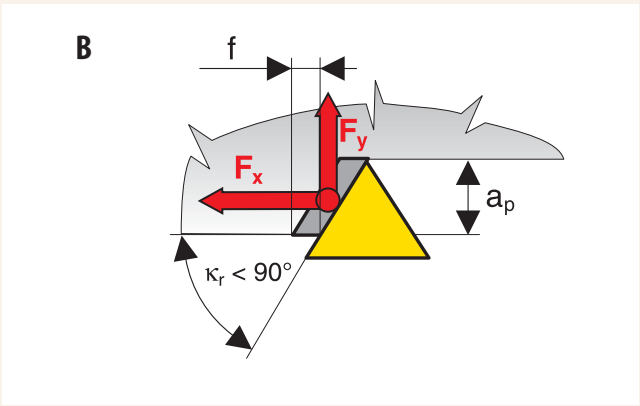
In the next paragraph are some recommendations on how to prevent vibrations from increasing.

The probability of vibration is greater during roughing, where higher cutting forces (radial and tangential) act due to cutting a bigger cross-section of chip.

You should use the tool with the maximum setting angle (near) $\kappa_r \approx 90°$ to reduce the risk of vibration.

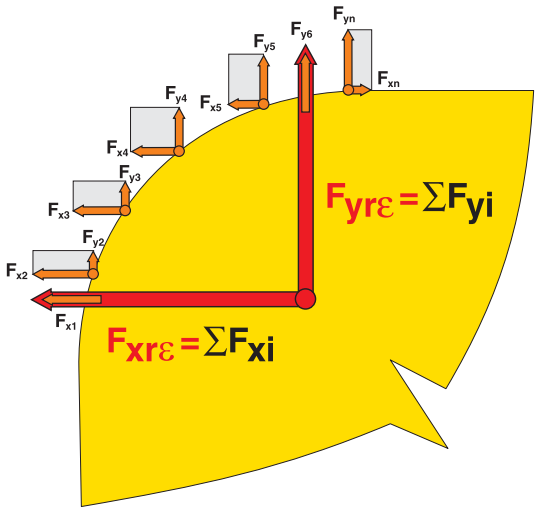
In this case you reach the maximum chip thickness h at cutting depth a_p and feed f, and the specific cutting resistance reaches the minimum value and the radial component of the cutting force F_y as well (which causes the deflection of the workpiece). The feed component of cutting force F_x reaches the maximum value at $\kappa_r \approx 90°$ (acts in the direction of the axis of rotation of the workpiece and has minimum influence on its deflection). See the diagram in following picture a + b. For instance, at setting angle $\kappa_r \approx 75$, the value of F_y increases two times compared with the value $\kappa_r = 90°$.





The forces acting on the corner of the cutting insert (with corner radius r_ε) have the biggest influence on the radial component of the cutting force at setting angle $\kappa_r = 90°$.

This is a passive component of the cutting force, which pushes the workpiece away. Its components are divided into forces F_x and F_y, as you can see in following picture. The greater the radius rε, the greater the share of the cutting forces F_y acting on the corner of the cutting insert and the deflection (pushing away) of the workpiece.



PRAMET

In order to reduce the probability of vibration, choose the smallest corner radius of cutting insert r_ε.

To reduce the risk of vibration it is also necessary to use a chip breaker with the maximum rake face land angle γ (reduction of F_y) and, if possible, with a honed cutting edge (cutting edge design E) – sharp cutting edge (not S – chamfer + honing).

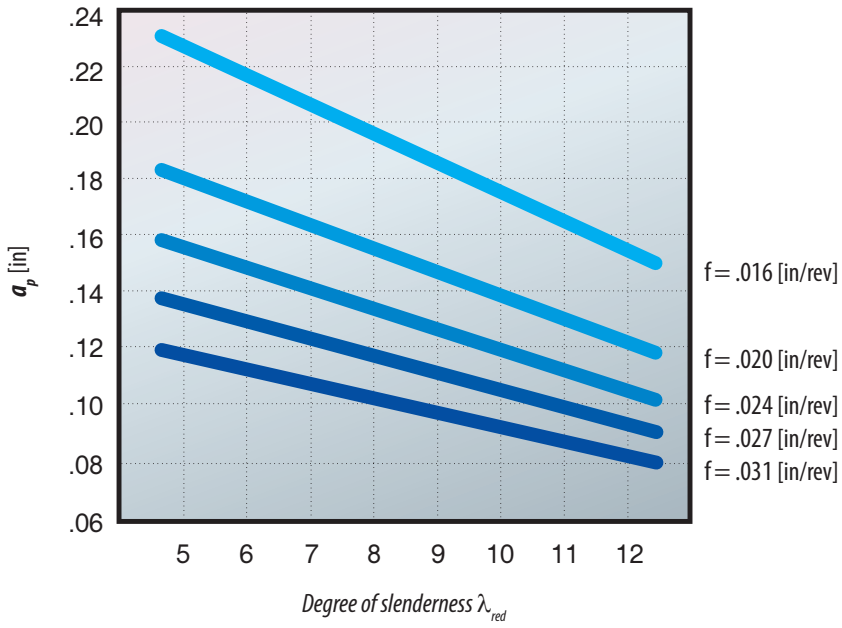
The risk of vibration increases when tools with abnormal flank wear or coated grades are used (the increased thickness of the coating layer increases the radius of honing on the cutting edge). The application of PVD coated grades or grades with thin MT-CVD coating is recommended, for example grade 6640.

Use the largest diameter of boring bar and the shortest overhang during internal turning.

The problem of increasing vibrations can be solved by changing the cutting conditions, especially by reducing the cutting depth a_p.

To choose the right cutting conditions, use values in the following table (experimentally determined values). The values are applicable for the tools with cutting insert $\kappa_r \approx 90°$ and a corner radius $r_\varepsilon = 1/32"$ [0,031 in].

The influence of cutting speed on vibrations is not evident. The frequency of the cutting force can be changed and vibrations almost eliminated by changing the cutting speed. That is why it is necessary both to increase and decrease the cutting speed.

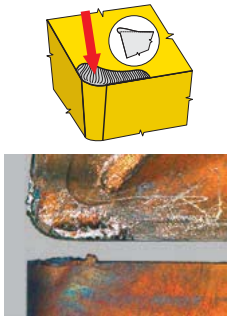


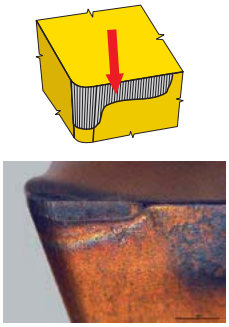
The same is true for the feed, the cutting force is altered and a change in frequency is reached by changing the feed. It is recommended to both increase and decrease the feed.

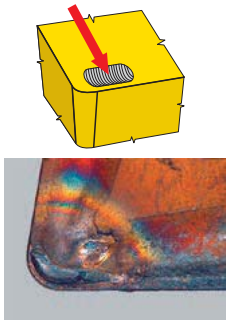
In turning of very slender shafts $\lambda_{red} >> 12$ it is very effective to use a follow rest (travelling stay) to eliminate the vibration. The follow rest follows the movement of the cutting edge and supports the workpiece at the point of cut against the cutting force direction.

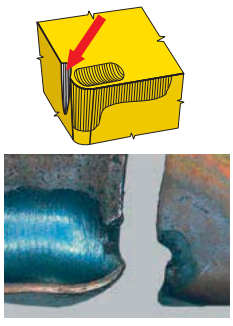
The follow rests are very effective, but attention must be paid to adjusting the pressure between the rest and the workpiece. The rest must not deform the machined shaft. The high pressure may cause vibrations. If the part of the rest is a rotating element (for example an anti-friction bearing), the touch point must have the minimum displacement.

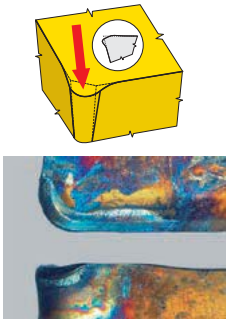
When turning and boring with very slender tools, using special boring bars with shock absorbers to reduce vibrations is very effective.

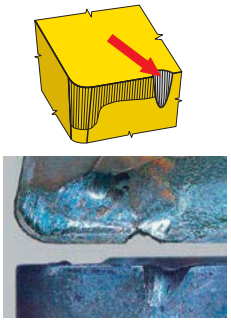
Picture	BUILT-UP EDGE	
	**Description and cause:** The machined material gets stuck to the cutting edge of the insert. When it breaks off, the edge becomes brittle and cracks, which has a negative effect on the quality of the machined surface.	**Corrective measures:** - increase the cutting speed - increase the feed rate - use a coated grade - do not use coolant - choose a more easy-cutting chip breaker

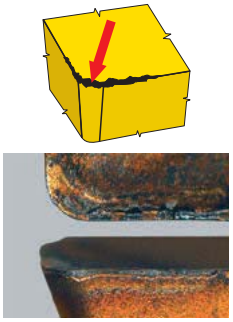
Picture	FLANK WEAR	
	**Description and cause:** Flank wear is one of the main factors that affects the service life of the insert. It is caused by friction between the insert and the machined material. It cannot be fully eliminated, but it can be reduced.	**Corrective measures:** - use a more wear-resistant grade - reduce the cutting speed - increase the feed rate (if it is under .400 in/rev per tooth) - use coolant or increase cooling

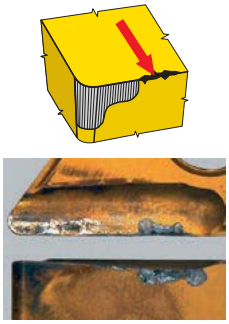
Picture	CRATERING	
	**Description and cause:** Cratering usually appears on inserts with a plain face.	**Corrective measures:** - use a more wear resistant grade - reduce the cutting speed - increase the feed rate (if it is under 0.1 in/rev) - use coolant or increase the intensity of cooling

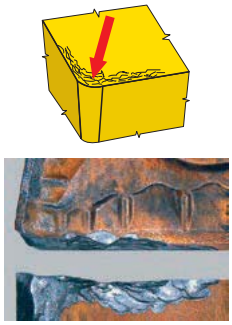
Picture	OXIDATION GROOVE ON THE MINOR EDGE	
	**Description and cause:** The main factor that limits the service life of the tool. It usually occurs during turning, where a combination of oxidation on the groove and cratering roughens the machined surface.	**Corrective measures:** - use a coated or more wear-resistant grade, if possible use Al_2O_3 coated inserts - use coolant or increase the intensity of cooling - reduce the cutting speed

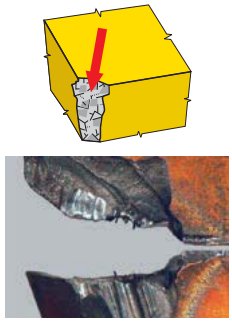
Picture	PLASTIC DEFORMATION	
	**Description and cause:** This is caused by high thermal stress on the cutting edge (high feed rate and cutting speed).	**Corrective measures:** - use a more wear-resistant grade - reduce the cutting speed - reduce the feed rate - use a coolant or increase cooling - use a cutting insert with a larger corner radius - use a cutting insert with a larger corner angle

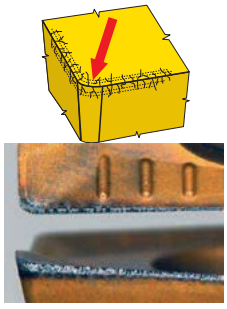
Picture	NOTCH WEAR	
	**Description and cause:** This occurs where the cutting edge of the insert comes into contact with the surface of the machined material. It is caused by the hardening of the surface layer of the material and by burrs. It usually appears on stainless austenitic steels.	**Corrective measures:** - use a coated or more wear-resistant grade, if possible use Al_2O_3 coated inserts - select a tool with a smaller setting angle - reduce the cutting speed - reduce the feed rate

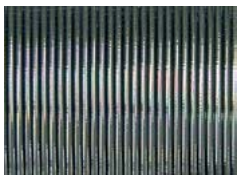
Picture	CHIPPING OF CUTTING EDGE	
	**Description and cause:** This usually appears together with another type of wear. It is caused by low rigidity of machine-tool-workpiece or by hard chip forming.	Corrective measures: - increase the cutting speed - reduce the feed rate - select a stronger chip breaker - minimize the vibrations - select a tougher grade

Picture	CHIPPING OF CUTTING EDGE (OUT OF CUT)	
	**Description and cause:** This is caused by inadequate chip forming, which causes mechanical damage to the cutting edge.	**Corrective measures:** - change the feed rate - select a tool with a different setting angle - use an insert with a different geometry - use a tougher grade

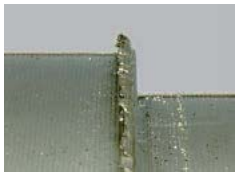
Picture	CRACKS ALONG THE FLANK	
	**Description and cause:** This is caused by high dynamic stress on the area behind the cutting edge.	**Corrective measures:** - use a tougher grade - change the cutting conditions - use an insert with a different geometry or an insert with a different cutting edge condition (...T, ...S, ...K, ...P) - change the feed

Picture	INSERT FRACTURE	
	**Description and cause:** This has numerous causes and depends on the workpiece material, grade and condition, and on the rigidity of the machine-tool-workpiece assembly, as well as the extent of wear and cutting conditions.	**Corrective measures:** - use a tougher grade - reduce the feed and depth of cut - use an insert with a bigger corner radius - use a cutting insert with a bigger corner angle - choose a stronger chip breaker - choose a thicker insert

Picture	COMB CRACKS	
	**Description and cause:** This is caused by high thermal stress on the cutting edge during interrupted cut.	**Corrective measures:** - use plenty of coolant or stop using coolant - reduce the cutting speed - reduce the feed rate - use tougher grade

Picture	POOR SURFACE QUALITY	
	**Description and cause:** Numerous causes depending on the workpiece material, cutting conditions (feed rate and cutting speed), the condition of the cutting edge, the extent and type of wear, and the condition and rigidity of the machine-tool-workpiece assembly. - incorrect tool chosen - incorrect chip thickness - incorrect cutting speed - coolant is needed - high feed rate	**Corrective measures:** - use a wiper insert - use a cutting insert with the right geometry - reduce the feed rate - change (usually increase) the cutting speed - use a coolant - improve the stability of the tool and workpiece - change the chip cross section - select a more easy-cutting chip breaker - increase the nose radius

Picture	VIBRATIONS	
	**Description and cause:** This is a very common problem, which is mainly caused by an unbalanced workpiece or tool, unstable fixing of the workpiece, high cutting forces or tool overhang.	**Corrective measures:** - improve the stability of the tool and workpiece - reduce the depth of cut - minimize tool overhang - reduce the cutting speed - use a tool with smaller setting angle - reduce the chip cross section - use a tool with a low cutting resistance - increase the feed rate - select a more easy-cutting chip breaker - increase the nose radius

Picture	BURRS	
	**Description and cause:** This usually occurs on soft steels and plastic materials.	**Corrective measures:** - use a cutting insert with a sharp cutting edge - use a cutting insert with positive geometry - use a tool with a smaller setting angle

Picture	ERRORS IN DIMENSIONS AND SHAPE OF WORKPIECE	
	Description and cause: Depends on a number of factors.	**Corrective measures:** - use a wear-resistant cutting insert - improve the stability of the cutter and workpiece - minimize tool overhang - use a workpiece with a suitable machining allowance

Picture	INADEQUATE CHIP FORMATION	
	**Description and cause:** Using a chip with a suitable shape is as important as its durability (service life of the tool). The workpiece material, the feed rate, the depth of cut and the cutting geometry all have an effect on chip forming. A chip that is too long is unacceptable for various reasons, while a chip that is too short is undesirable as it overloads the cutting edge and causes vibrations.	**Corrective measures:** - change the feed rate and depth of cut - use a more suitable cutting geometry - change the cutting conditions

GENERAL PRINCIPLES

Check the seat condition of the cutting insert

Before clamping a new cutting insert or changing the edge, it is necessary to clean the seat and check its condition or the condition of the anvil and wedge (especially the damage under the corner of the cutting insert).

Check and service the clamping parts

It is also important to check the clamping parts, including lamping levers, screws, wedges and clamps. Only use original, undamaged parts (found in the catalogue). Regularly lubricate the threads and the binding surface of screws, for example using heat-resistant lubricant (Molykotete G.). For assembly and disassembly, only use screwdrivers and wrenches specified in our catalogue or recommended by the tool manufacturer. Pay attention to the correct tightening (proportional) - it is advisable to use a torque wrench.

Check the tightening

Before tightening, check the fit of the cutting insert on the whole of the binding surface and in the radial and axial directions. Cutting inserts and tools must always be clean and undamaged.

Value	Formula	Unit	Note
Number of revolutions	$n = \frac{v_c \cdot 12}{D \cdot \pi}$	[1.min]	
Cutting speed	$v_c = \frac{\pi \cdot D \cdot n}{12}$	[ft.min]	
Feed per revolution	$f_{ot} = \frac{f_{min}}{n} = f_z \cdot z$	[in.rev]	
Feed per minute (Linear Feedrate)	$f_{min} = v_f = f_{ot} \cdot n$	[in.min]	
Max. height of profile R_{max}	$R_{max} = 127000 \cdot \frac{f^2}{r_\varepsilon}$	[µin]	
Surface finish R_a	$R_a = 33337 \cdot \frac{f_z^{1,88}}{r_\varepsilon^{.97}}$	[µin]	
Chip cross section	$A = f_{ot} \cdot a_p$	[in²]	
Chip thickness (For insert with straight edge)	$h = f \cdot sin\ \kappa_r$	[in]	
Chip thickness (For round cutting insert)	$h = f_z \cdot \sqrt{\frac{a_p}{D}}$	[in]	
Metal removal rate	$Q = 12 \cdot a_p \cdot f_{ot} \cdot v_c$	[in³/min]	

n Number of revolutions [1.min]
D Diameter (of tool or workpiece) [in]
v_c Cutting speed [ft.min]
f_{rev} Feed per revolution [in.rev]
f_{min} Feed per minute (Linear Feedrate) [in.min]

R_{max} max. height of profile [µin]
R_a surface finish [µin]
f_{rev} feed per revolution [in/rev]
r_ε nose radius [in]

A Chip cross section [in]
f_{rev} Feed per revolution [in.rev]
a_p Axial depth of cut [in]
κ_r Primary edge setting angle [°]
h Chip thickness [in]
v_c Cutting speed [in/min]
f_{min} Feed per minute (Linear Feedrate) [in/min]
Q Material removal rate per minute [in³/min]

Material	Steel	Cast iron	Al
Coefficient x	20	25	100

CLAMPING SCREW

Screw designation 	Screwdriver 	Torque [Nm]*
HS 0520C	HXK 4	6
HS 0620C	HXK 5	8
HS 0625	HXK 5	8
HS 0630	HXK 5	8
HSI 1020	HXK6	7.4
SR 85011-T15P	SDR T15P	5
US 2505-T07P	SDR T07P	0.9
US 2506-T07P	SDR T07P	0.9
US 3007-T09P	SDR T09P	2
US 3510-T15P	SDR T15P	3
US 3512A-T15P	SDR T15P	3
US 36	HXK 4	6
US 38	HXK 5	8
US 4011-T15P	SDR T15P	3.5
US 45013-T20P	SDR T20P	5
US 4512-T15P	SDR T15P	5
US 4514A-T20	SDR T20	5
US 46017-T20P	SDR T20P	5
US 5018-T20P	SDR T20P	5
US 6020-T25P	SDR T25P	6
US 2046-T07P	SDR T07P	0.9
US 2003-T07P	SDR T07P	0.9
US 2009-T15P	SDR T15P	3
US 2020-T07P	SDR T07P	0.9
US 2010-T15P	SDR T15P	3
US 2018-T15P	SDR T15P	3
US 2001-T15P	SDR T15P	3
US 2003-T07P	SDR T07P	0.9
CS 8601-T09P	SDR T09P	1.7
CS 8602-T15P	SDR T15P	3.9
CS 8603-T20P	SDR T20P	6.4
CS 8604-T25P	SDR T25P	9.5

TORQUE HANDLE

Replaceable 	Torque [Nm]	Thread of clamping screw
MR-0,8-2,0 vario	0.8 - 2.0	M 2 - M 3
MR-1,0-5,0 vario	1.0 - 5.0	M 2,5 - M 5
MR-0,9 fix	0.9	M 2
MR-2,0 fix	2.0	M 3
MR-3,0 fix	3.0	M 3,5
MR-3,5 fix	3.5	M 4
MR-5,0 fix	5.0	M 5

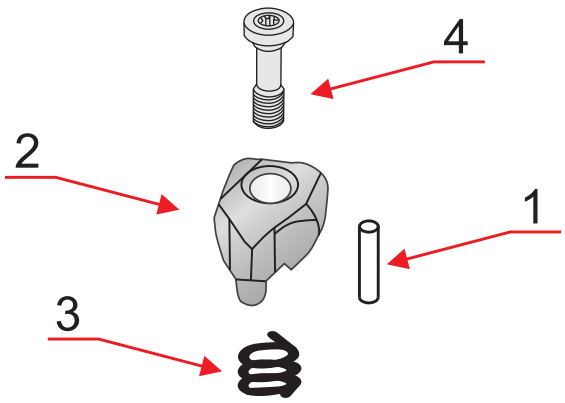
DRIVERS

Exchangeable driver 
D-T6
D-T6P
D-T7
D-T7P
D-T8
D-T8P
D-T9
D-T9P
D-T15
D-T15P
D-T20
D-T20P

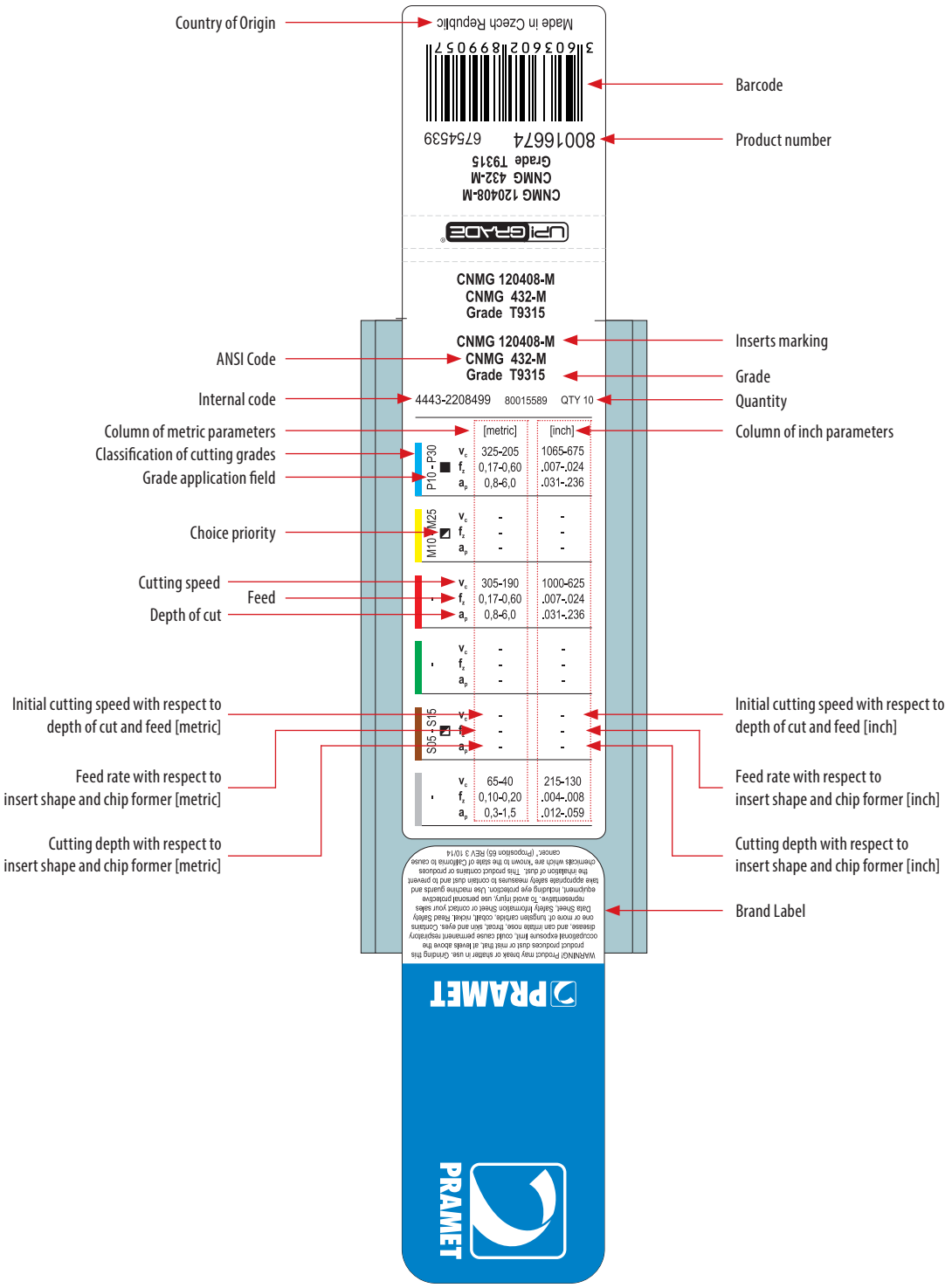
SCREW LUBRICATION

Owing to the high thermal stress on the clamping screws, it is advisable to lubricate them with a high-quality paste such as MOLYKOTE 100.

COMPLETE CLAMP SET



	1	2	3	4
	PIN	CLAMP	SPRING	SCREW
DCS 09	CP 3055	CD 09	PR 0157	CS 8601-T09P
DCS 12	CP 3007	CD 12	PR 0158	CS 8602-T15P
DCS 16	CP 3007	CD 16	PR 0159	CS 8603-T20P
DCS 19	CP 3007	CD 19	PR 0159	CS 8603-T20P
DCS 25	CP 3007	CD 25	PR 0101	CS 8604-T25P
DCS 16V	CP 3007	CD 16V	PR 0158	CS 8602-T15P


Country of Origin
Made in Czech Republic
3 603602 899057
Barcode
8001667 4 6754539
Product number
CNMG 120408-M
CNMG 432-M
Grade T9315
UNIGRADE
CNMG 120408-M
CNMG 432-M
Grade T9315
Inserts marking
ANSI Code
CNMG 120408-M
CNMG 432-M
Grade T9315
Grade
Internal code
4443-2208499 80015589 QTY 10
Quantity
Column of metric parameters
[metric] [inch]
Column of inch parameters
Classification of cutting grades
Grade application field
P10 - P30
vc 325-205 1065-675
fz 0,17-0,60 .007-.024
ap 0,8-6,0 .031-.236
Choice priority
M10 - M25
vc - -
fz - -
ap - -
Cutting speed
Feed
Depth of cut
vc 305-190 1000-625
fz 0,17-0,60 .007-.024
ap 0,8-6,0 .031-.236
vc - -
fz - -
ap - -
Initial cutting speed with respect to depth of cut and feed [metric]
S05 - S15
vc - -
fz - -
ap - -
Initial cutting speed with respect to depth of cut and feed [inch]
Feed rate with respect to insert shape and chip former [metric]
vc 65-40 215-130
fz 0,10-0,20 .004-.008
ap 0,3-1,5 .012-.059
Feed rate with respect to insert shape and chip former [inch]
Cutting depth with respect to insert shape and chip former [metric]
Cutting depth with respect to insert shape and chip former [inch]
WARNING! Product may break or shatter in use. Grinding this product produces dust or mist that, at levels above the occupational exposure limit, could cause permanent respiratory disease, and can irritate nose, throat, skin and eyes. Contains one or more of tungsten carbide, cobalt, nickel. Read Safety Data Sheet. Safety information Sheet or contact your sales representative. To avoid injury, use personal protective equipment, including eye protection. Use machine guards and take appropriate safety measures to contain dust and to prevent the inhalation of dust. This product contains or produces chemicals which are known to the state of California to cause cancer. (Proposition 65) REV 3 10/14
PRAMET
Brand Label