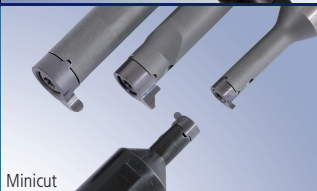




Ultramini



Minicut



System DED / System ZTP



Tool Holders



Broaching



Rotaline



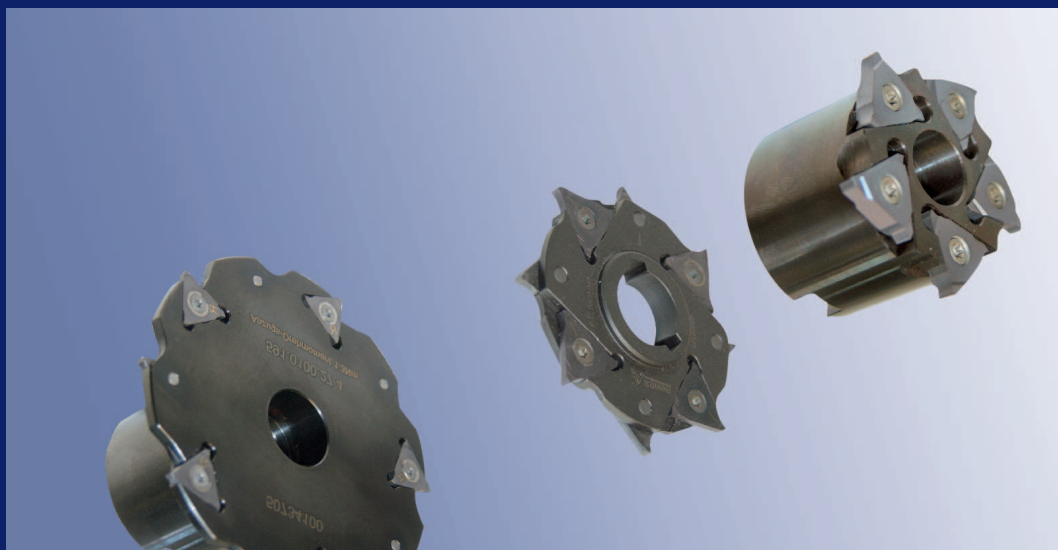
Mikromill



Minimill



Swissline



SYSTEM 500

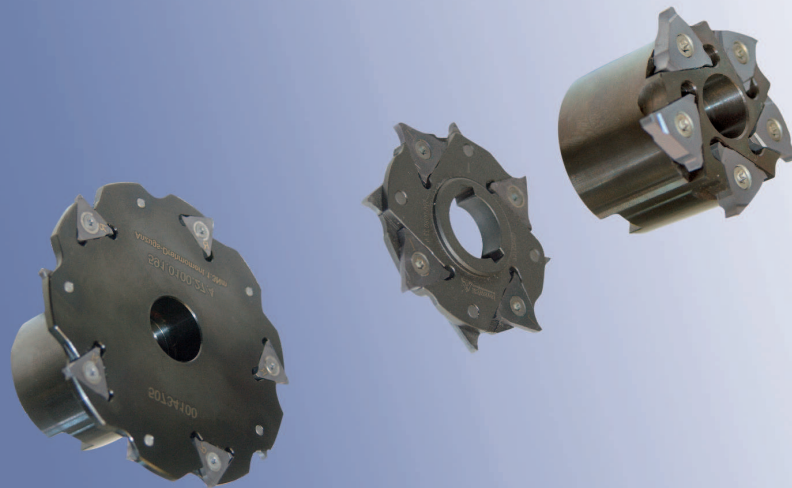
GROOVE MILLING AND SLOTTING CUTTER

Express Delivery Only Item

premium carbide cutting tools



Dümmel



System 500



Groove milling by circular interpolation
Groove milling and slotting cutter

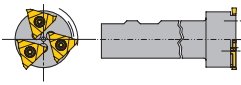


System 500

groove milling
by circular interpolation

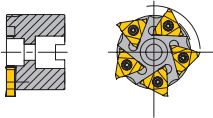
summary

milling cutter type



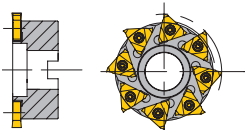
500.44-3D
min. bore \varnothing 45 mm

... 384



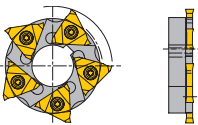
510.0063.05-D
min. bore \varnothing 64 mm

... 385



510.0080.08-D
min. bore \varnothing 81 mm

... 386

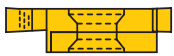


581.0. ...
min. bore \varnothing 64 mm

... 387



**milling inserts
type 514**



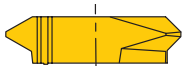
circlips . . . 388
DIN 471 / 472



**circlips for machining
of aluminium** . . . 389
DIN 471 / 472



**circlips for grooves
with chamfering** . . . 390
DIN 471 / 472



metr.ISO-Thread . . . 392
partial profile,internal

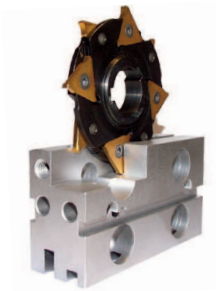


System 500

groove milling
and slotting cutter

summary

**high performance
disk-milling cutter
width > 5 mm**



type 590 . . . **393**
**high performance
disk-milling cutter**
min. bore \varnothing 80 mm



type 591 . . . **395**
**high performance arbor
mounted disk-milling
cutter**
 \varnothing 125 mm
b = 6 mm

R/L 514 . . . **396**
milling insert



machining example
slotting cutter . . . **397**

summary

System 500

groove milling
and slotting cutter



high performance slotting cutter width 3 + 4 + 5 mm



type 590 . . . **398**
high performance
slotting cutter
min. bore Ø 80 mm



type 591 . . . **399**
high performance-
arbor mounted
slotting cutter
min. bore Ø 80 mm



R/L 510 . . . **401**
indexable
milling insert

Technical instructions

evaluation of the cutting
data for groove milling . . . **402**

Basic information about
thread milling . . . **404**

carbide grade and coatings . . . **406**

cutting data . . . **408**



TIPP!



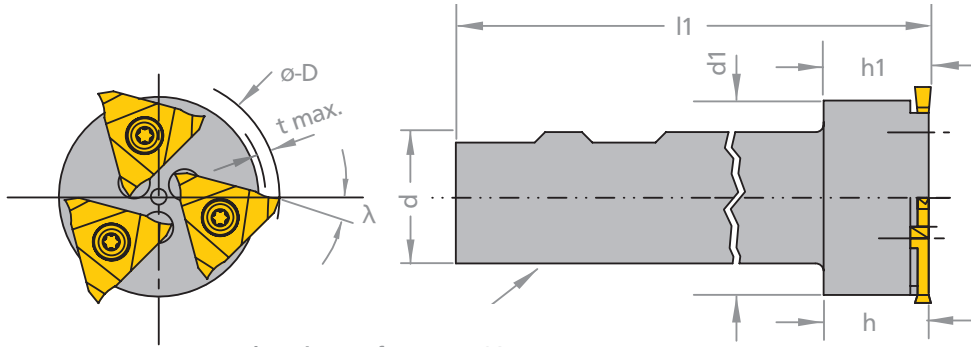
System 500

groove milling
by circular interpolation

Type 500.44.3-D

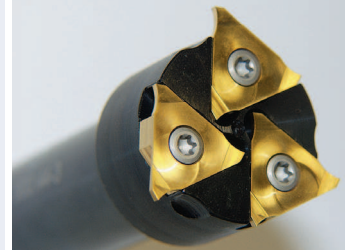
toolholder

min. bore \varnothing 45 mm
depth of groove max. 4 mm
width of groove 1.3 - 6 mm



clamping surface DIN 1835

torque = 3 Nm
further sizes upon request
dimensions in mm



part number	Ø D cutting edge		d1	l1	Ø d g6	λ	h (ohne Fräsplatte) h (without insert)	h1	t max.	Zähnezahl number of cutting edges	spare parts		
											Nutenfräser groove milling holder	Spannschraube screw	torx-screw-driver
500.44.3-D	44	34	125	25	14°	22	22.4	4.0	3	500.44.3-D	85.818	TX-20/80	
											type of insert		
											514		

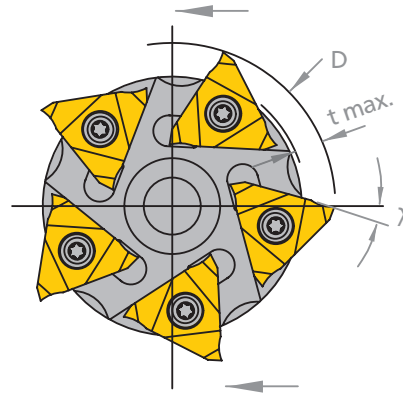
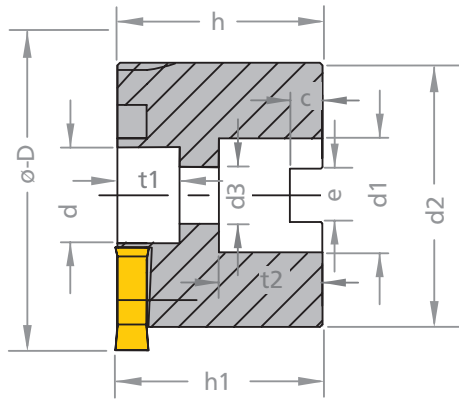
Type 510.0063.05-D

toolholder

min. bore \varnothing 64 mm
 depth of groove max. 5 mm
 width of groove 1.3 - 6 mm

System 500

groove milling
 by circular interpolation



torque = 3 Nm
 further sizes upon request
 dimensions in mm



part number	Ø D cutting edge	d	d1	d2	d3	h (ohne Fräsplatte) h (without insert)	h1	t max.	Zähnezahl number of cutting edges	spare parts		
										Nutenfräser groove milling holder	Spannschraube screw	torx-screw-driver
510.0063.05-D	63	18.5	22	51	11	39.6	40	5.0	5	510.0063.05-D	85.818	TX-20/80
	t1	t2	c	e	λ							
	12	20	6.3	10.3	10°							
										type of insert		
										514		



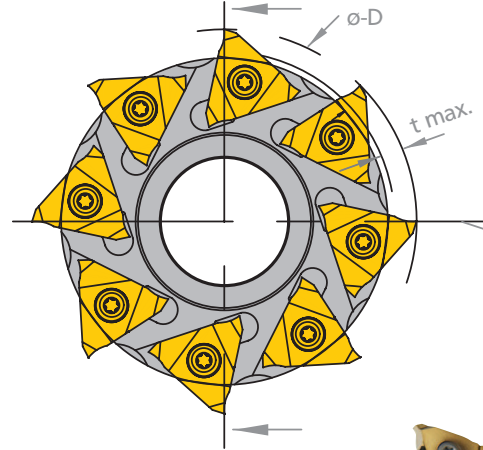
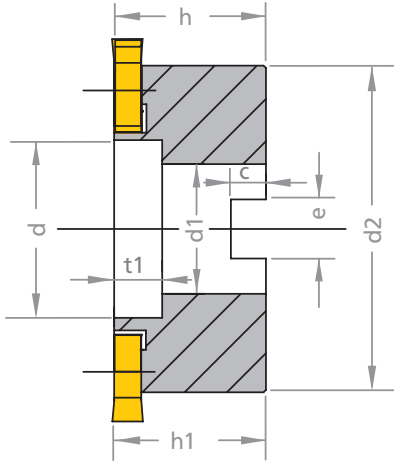
System 500

groove milling
by circular interpolation

Type 510.0080.08-D

toolholder

min. bore \varnothing 81 mm
depth of groove max. 5 mm
width of groove 1.3 - 6 mm



torque = 3 Nm
further sizes upon request
dimensions in mm

part number	Ø D cutting edge	d	d1	d2	h (ohne Fräsplatte) h (without insert)	h1	t max.	Zähnezahl number of cutting edges	spare parts		
									Nutenfräser groove milling holder	Spannschraube screw	torx-screw-driver
510.0080.08-D	80	37	27	68	31.6	32	5.0	8	510.0080.08-D	85.818	TX-20/80
	t1	c	e	λ							
	10	7.3	12.3	10°							
									type of insert		
									514		

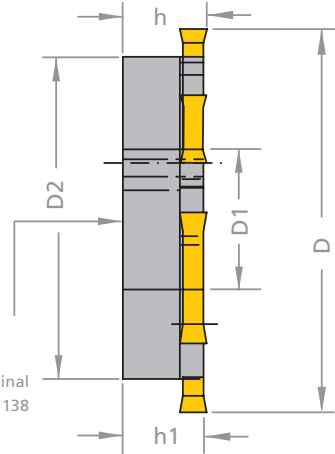
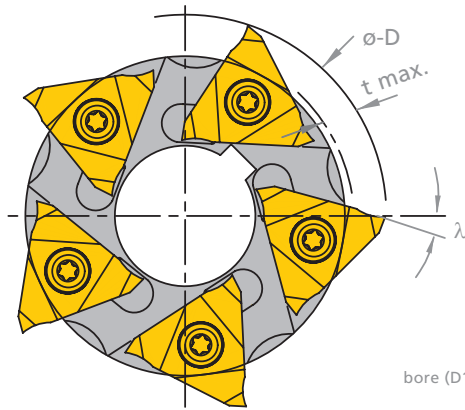
Type 581

toolholder

min. bore \varnothing 64 mm
 depth of groove max. 5 mm
 width of groove 1.3 - 6 mm

System 500

groove milling
 by circular interpolation



bore (D1) with longitudinal keyway to DIN 138

torque = 3 Nm
 further sizes upon request
 dimensions in mm



part number	\varnothing D cutting edge								spare parts		
		D1	D2	λ	h (without insert)	h1	t max.	number of cutting edges	groove milling holder	screw	orz-screw-driver
581.0063.05-D	63	22	51	14°	14	14.2	5.0	5	581. ...-D	85.818	TX-20/80
581.0080.08-D	80	27	68	10°	16	16.2	5.0	8			
581.0100.10-D	100	32	88	10°	20	20.2	5.0	10			

		type of insert
		514

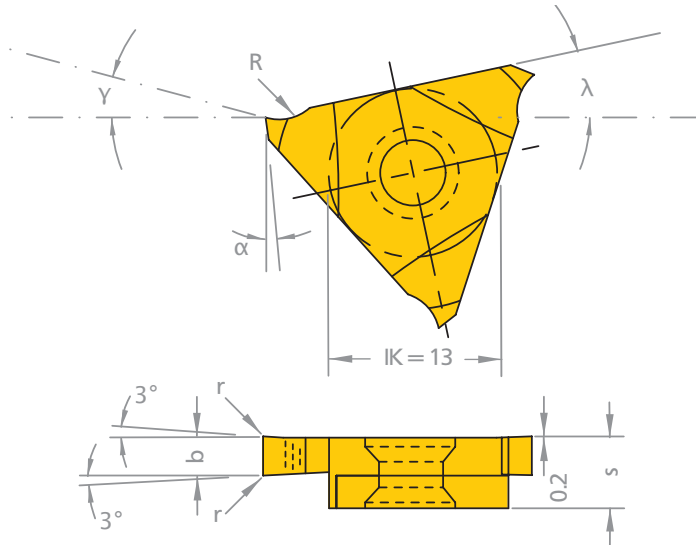


System 500

groove milling
by circular interpolation

514

milling insert
for circlips DIN 471 / 472



righthand (514.): as shown
lefthand (L514.): mirror image
dimensions in mm

part number	Ø groove dimension	s	b - 0.02	r	angle lower	for toolholder type	standard carbide grade
514.0130.00-D	1.3	5.4	1.41	0.1	3°	Typ 500 Typ 510 Typ 581	AL41F
514.0160.00-D	1.6	5.4	1.71	0.15	3°		
514.0185.00-D	1.85	5.4	1.96	0.15	3°		
514.0215.00-D	2.15	5.4	2.26	0.15	3°		
514.0265.00-D	2.65	5.4	2.76	0.15	3°		
514.0315.00-D	3.15	5.4	3.26	0.15	3°		
514.0415.00-D	4.15	5.4	4.26	0.15	3°		
514.0515.00-D	5.15	5.4	5.26	0.15	3°		

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example grade AL41F:
righth.: 514.0130.00-D/AL41F
lefth.: L514.0130.00-D/AL41F (on demand)

514

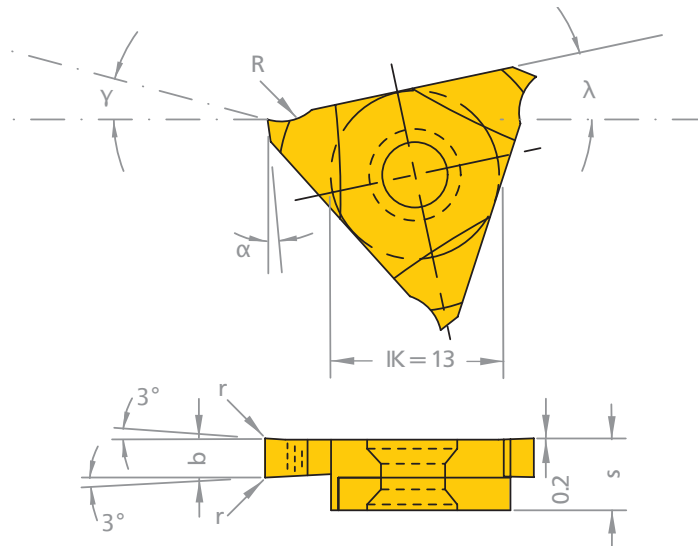
System 500

groove milling

by circular interpolation



milling insert circlips for machining
of aluminium DIN 471 / 472



righthand (514.): as shown
lefthand (L514.): mirror image

dimensions in mm

part number	Ø groove dimension	Ø groove dimension			clear angel lower	for toolholder type	standard carbide grade
		s	b - 0.02	r			
514.0130.40-D	1.3	5.4	1.41	0.1	3°	Typ 500 Typ 510 Typ 581	AL41F
514.0160.40-D	1.6	5.4	1.71	0.15	3°		
514.0185.40-D	1.85	5.4	1.96	0.15	3°		
514.0215.40-D	2.15	5.4	2.26	0.15	3°		
514.0265.40-D	2.65	5.4	2.76	0.15	3°		
514.0315.40-D	3.15	5.4	3.26	0.15	3°		
514.0415.40-D	4.15	5.4	4.26	0.15	3°		
514.0515.40-D	5.15	5.4	5.26	0.15	3°		

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example grade AL41F:
righth.: 514.0130.40-D/AL41F
lefth.: L514.0130.40-D/AL41F (on demand)

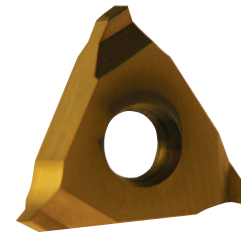
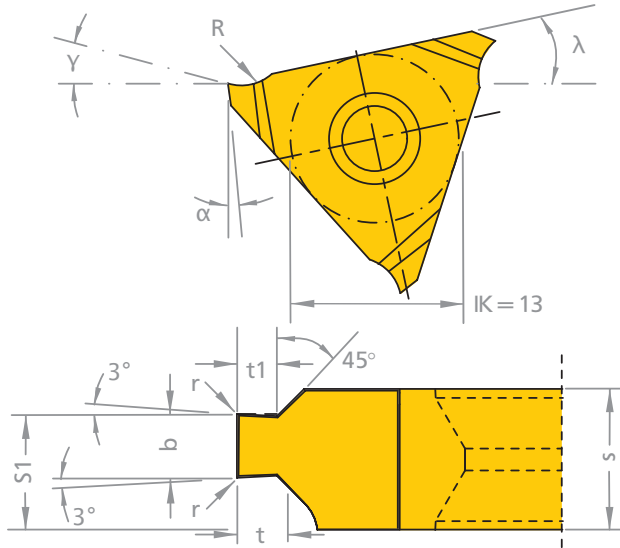


System 500

groove milling
by circular interpolation

514

circlips for grooves with chamfering
DIN 471 / 472



righthand (514.): as shown
lefthand (L514.): mirror image

dimensions in mm

part number	Nutmaß Kreis Ø groove dimension	s	S1 ± 0.01	b - 0.02	r	t	t1 - 0.04	for toolholder type	standard carbide grade
514.1105.35-D	1.1	5.4	4.52	1.21	0.1	0.5	0.49	Typ 500 Typ 510 Typ 581	AL41F
514.1307.35-D	1.3	5.4	4.62	1.41	0.1	0.7	0.67		
514.1308.35-D	1.3	5.4	4.62	1.41	0.1	0.85	0.83		
514.1609.35-D	1.6	5.4	4.52	1.71	0.15	0.85	0.83		
514.1610.35-D	1.6	5.4	4.52	1.71	0.15	1	0.97		
514.1812.35-D	1.85	5.4	4.64	1.96	0.15	1.25	1.23		
514.2115.43-D	2.15	5.4	4.79	2.26	0.15	1.5	1.47		
514.2616.43-D	2.65	5.4	4.54	2.76	0.15	1.5	1.47		
514.2617.43-D	2.65	5.4	4.54	2.76	0.15	1.75	1.72		

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example grade AL41F:
righth.: 514.1105.35-D/AL41F
lefth.: L514.1105.35-D/AL41F (on demand)

514

circlips for grooves with chamfering
DIN 471 / 472

System 500

groove milling
by circular interpolation



part number	Nutmaß Kreis Ø groove dimension	s	S1 ± 0.01	b -0.02	r	t	t1 -0.04	for toolholder type	standard carbide grade
514.3118.53-D	3.15	5.4	4.79	3.26	0.15	1.75	1.72	Typ 500 (p. 340) Typ 510 (p. 341/342) Typ 581 (p. 343)	AL41F
514.4120.53-D	4.15	5.4	4.99	4.26	0.15	2	1.97		
514.4125.53-D	4.15	5.4	4.99	4.26	0.15	2.5	2.47		
514.5130.61-D	5.15	6.1	5.85	5.26	0.15	3	2.97		



More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example grade AL41F:
righth.: 514.1105.35-D/AL41F
lefth.: L514.1105.35-D/AL41F (on demand)



SYSTEM 500

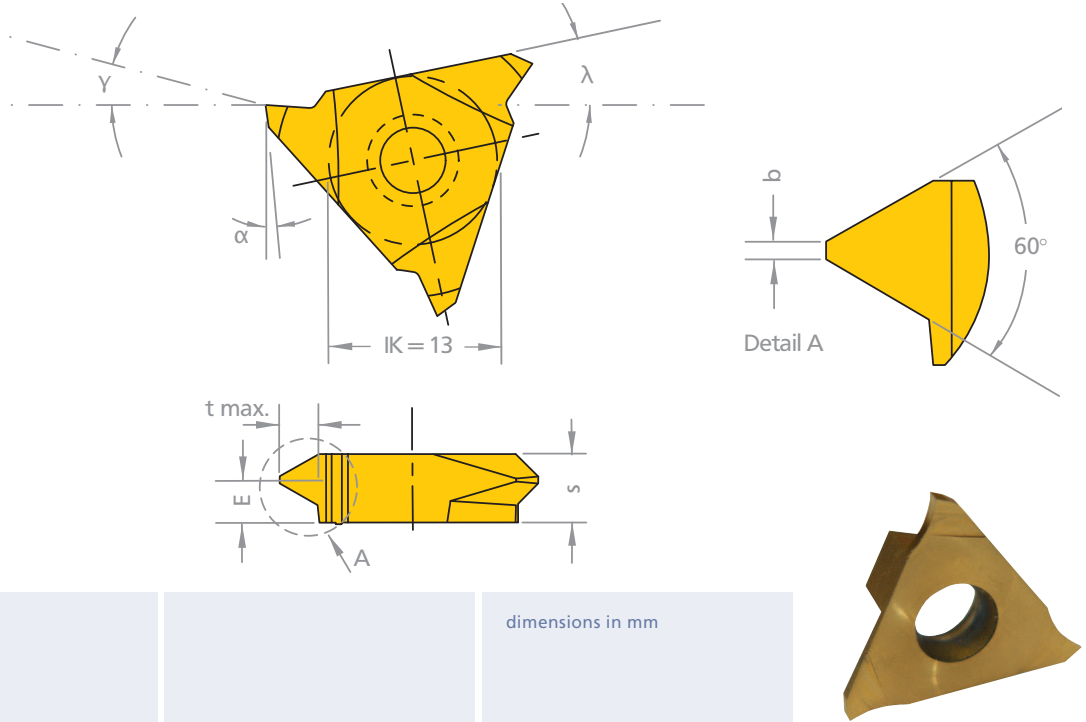
Nut- und Formfräsen

groove milling
by circular interpolation

514

Fräsplatte metr. ISO-Gewinde,
Teilprofil, innen

milling insert, metr. ISO-thread,
partial profile, internal



dimensions in mm

part number	pitch P from	pitch P to	s	E	b	t max.	for toolholder type	standard carbide grade
514.0815.01	1.5	1.5	5.4	4.6	0.19	0.81	Typ 500 Typ 510 Typ 581	AL41F
514.1020.01	2.0	2.0	5.4	4.4	0.25	1.08		
514.1535.01	1.5	3.5	5.4	3.9	0.18	1.89		
514.2140.01	3.5	4.0	5.4	3.7	0.43	2.17		
514.2445.01	3.75	4.5	5.4	3.4	0.47	2.44		
514.2750.01	4.0	5.0	5.4	3.35	0.5	2.7		
514.3260.01	4.5	6.0	5.4	3.0	0.56	3.25		
514.4060.01	3.5	6.0	5.4	3.0	0.44	3.52		

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example:
grade AL41F:
514.0815.01-DJ/AL41F

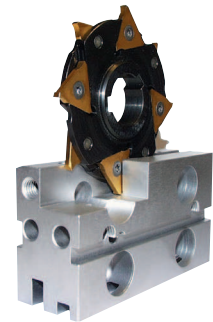
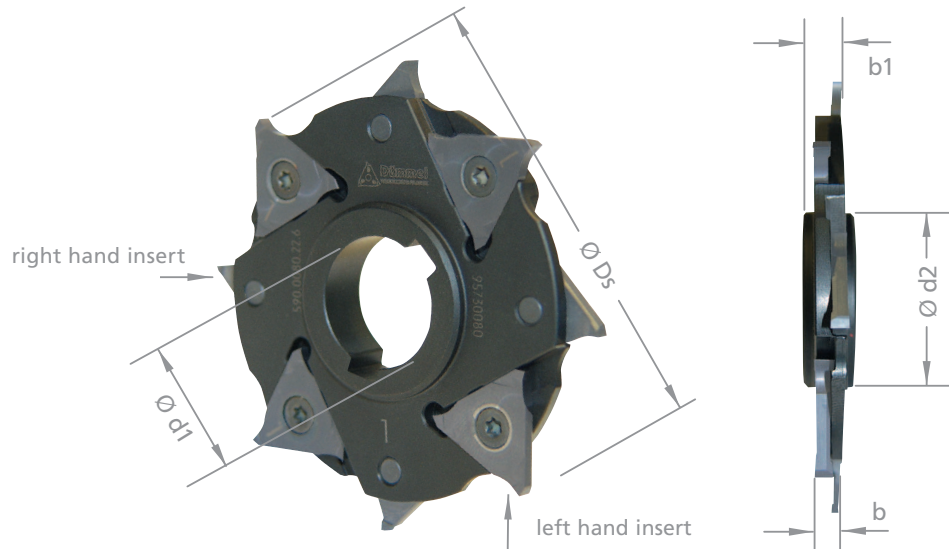
Type 590

high performance disk-milling-cutter
bore d1 with longitudinal keyway to
DIN 138

depth of groove up to 50 mm
width of groove up to 10 mm
cutting-edge \varnothing from Ds = 80 mm

SYSTEM 500

groove milling
and slotting cutter



torque = 3 Nm

further sizes upon request

dimensions in mm

part number	$\varnothing D_s$ Schneidkreis $\varnothing D_s$ cutting edge	$\varnothing d_1$	$\varnothing d_2$	b	b1	t max.	Typ R/L 514	insert type R/L 514
590.0080.22.6	80	22	33	6	10	22	R514.0632.00 (4x)	L514.0632.00 (4x)
590.0080.27.6	80	27	36	6	10	21	R514.0632.00 (4x)	L514.0632.00 (4x)
590.0080.27.8	80	27	36	8	12	21	R514.0843.00 (4x)	L514.0843.00 (4x)
590.0080.27.10	80	27	36	10	12	21	R514.1054.00 (4x)	L514.1054.00 (4x)
590.0100.32.6	100	32	47	6	10	25.5	R514.0632.00 (5x)	L514.0632.00 (5x)
590.0100.32.8	100	32	47	8	12	25.5	R514.0843.00 (5x)	L514.0843.00 (5x)
590.0100.32.10	100	32	47	10	12	25.5	R514.1054.00 (5x)	L514.1054.00 (5x)
590.0125.40.6	125	40	58	6	10	32.5	R514.0632.00 (6x)	L514.0632.00 (6x)
590.0125.40.8	125	40	58	8	12	32.5	R514.0843.00 (6x)	L514.0843.00 (6x)
590.0125.40.10	125	40	58	10	14	32.5	R514.1054.00 (6x)	L514.1054.00 (6x)
590.0160.40.6	160	40	58	6	10	50	R514.0632.00 (8x)	L514.0632.00 (8x)
590.0160.40.8	160	40	58	8	12	50	R514.0843.00 (8x)	L514.0843.00 (8x)
590.0160.40.10	160	40	58	10	14	50	R514.1054.00 (8x)	L514.1054.00 (8x)



SYSTEM 500

groove milling
and slotting cutter

Type 590

high performance disk-milling-cutter
bore d1 with longitudinal keyway to
DIN 138

depth of groove up to 50 mm
width of groove up to 10 mm
cutting-edge Ø from Ds = 80 mm

spare parts

part number	screw	wrench	torque
590.0080.22.6	5.06.25F	Tr15	2.0
590.0080.27.6	5.06.25F	Tr15	2.0
590.0080.27.8	5.08.25F	Tr20	2.8
590.0080.27.10	5.10.25	Tr20	3.0
590.0100.32.6	5.06.25F	Tr15	2.0
590.0100.32.8	5.08.25F	Tr20	2.8
590.0100.32.10	5.10.25	Tr20	3.0
590.0125.40.6	5.06.25F	Tr15	2.0
590.0125.40.8	5.08.25F	Tr20	2.8
590.0125.40.10	5.10.25	Tr20	3.0
590.0160.40.6	5.06.25F	Tr15	2.0
590.0160.40.8	5.08.25F	Tr20	2.8
590.0160.40.10	5.10.25	Tr20	3.0

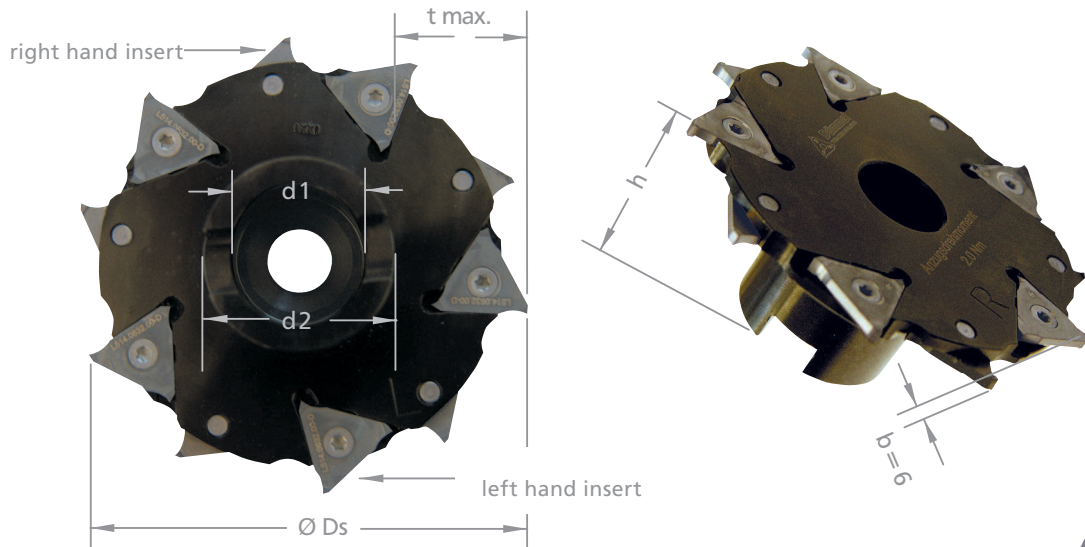
Type 591

high performance arbor
mounted disc-milling cutter

depth of groove 37.5 mm
width of groove 6 mm

SYSTEM 500

groove milling
and slotting cutter



torque = 2 Nm
further sizes upon request
dimensions in mm

part number	Ø Ds cutting edge						Typ R/L 514	insert type R/L 514
	Ø d1	Ø d2	h	b	t max.			
591.0125.27.6	27	48	50	6	37.5	R514.0632.00 (6x)	L514.0632.00 (6x)	

spare parts				
part number	screw	wrench	screw	washer
591.0125.27.6	5.06.25F	Tr15	DIN912-M12x35	DIN 433-13-2

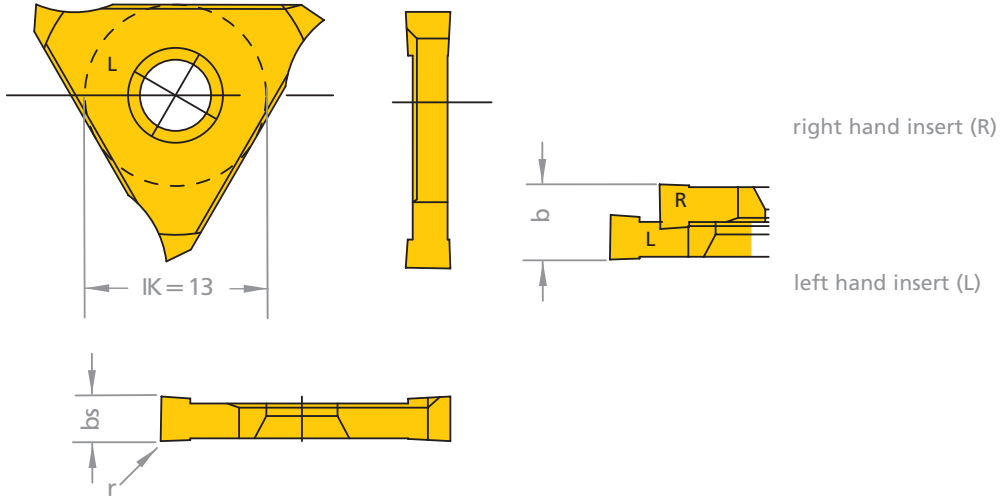


SYSTEM 500

groove milling
and slotting cutte

R/L 514

milling insert



right hand insert (R)

left hand insert (L)



righthand (R): as shown
lefthand version (L): mirror image

state right (R) or left (L) version

dimensions in mm

part number	b für Nutbreite b width of groove	bs	r	for toolholder	standard carbide grade
R/L 514.0632.00	6.0	3.2	0.2	Typ 590	AL41F
R/L 514.0843.00	8.0	4.3	0.2	Typ 591	
R/L 514.1054.00	10.0	5.4	0.2		

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example:
righthand version and grade AL41F:
R514.0632.00/AL41F

SYSTEM 500

machining example

groove milling
and slotting cutte



extremely positive grinded inserts with three cutting edges
guarantees best results, also using exotic or high-strength
materials.

Dümmel[®]
WERKZEUGFABRIK





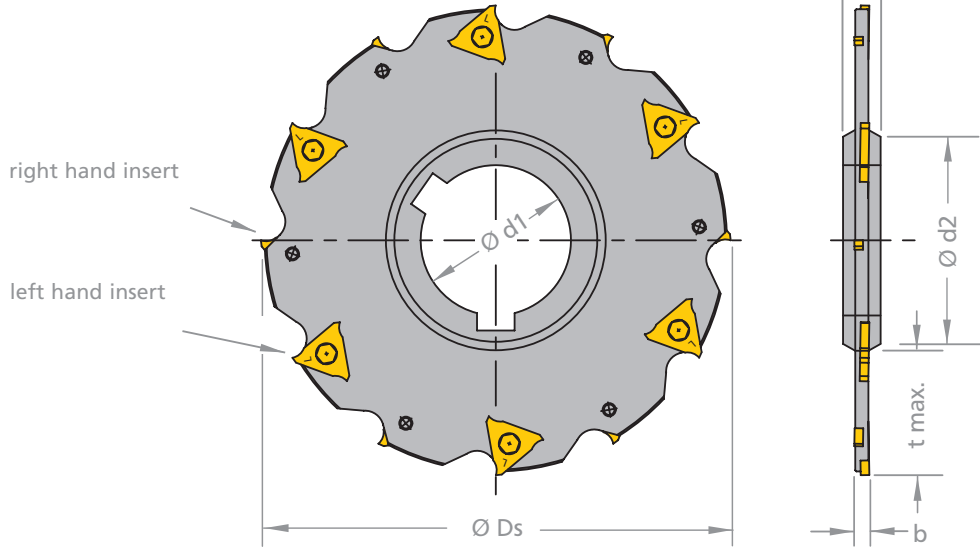
SYSTEM 500

groove milling
and slotting cutter

Type 590

high performance slotting
cutter
b = 3 + 4 + 5 mm

bore d1 with longitudinal
keyway according to DIN 138



3 mm: torque = 0.7 Nm
4+5 mm: torque = 1.3 Nm

further sizes upon request
dimensions in mm



part number	Ø Ds cutting edge						t max.	Type R/L 510	insert type R/L 510
		Ø d1	Ø d2	b	b1				
590.0080.27.3	80	27	40	3	8	18	R510.0317. (4x)	L510.0317. (4x)	
590.0100.32.3	100	32	46	3	8	25	R510.0317. (5x)	L510.0317. (5x)	
590.0125.40.3	125	40	54	3	10	32	R510.0317. (6x)	L510.0317. (6x)	
590.0160.40.3	160	40	54	3	10	50	R510.0317. (8x)	L510.0317. (8x)	
590.0080.27.4	80	27	42	4	8	18	R510.0423. (4x)	L510.0423. (4x)	
590.0100.32.4	100	32	48	4	8	25	R510.0423. (5x)	L510.0423. (5x)	
590.0125.40.4	125	40	58	4	10	32	R510.0423. (6x)	L510.0423. (6x)	
590.0160.40.4	160	40	58	4	10	50	R510.0423. (8x)	L510.0528. (8x)	
590.0080.27.5	80	27	42	5	8	18	R510.0528. (4x)	L510.0528. (4x)	
590.0100.32.5	100	32	48	5	8	25	R510.0528. (5x)	L510.0528. (5x)	
590.0125.40.5	125	40	58	5	10	32	R510.0528. (6x)	L510.0528. (6x)	
590.0160.40.5	160	40	58	5	10	50	R510.0528. (8x)	L510.0528. (8x)	

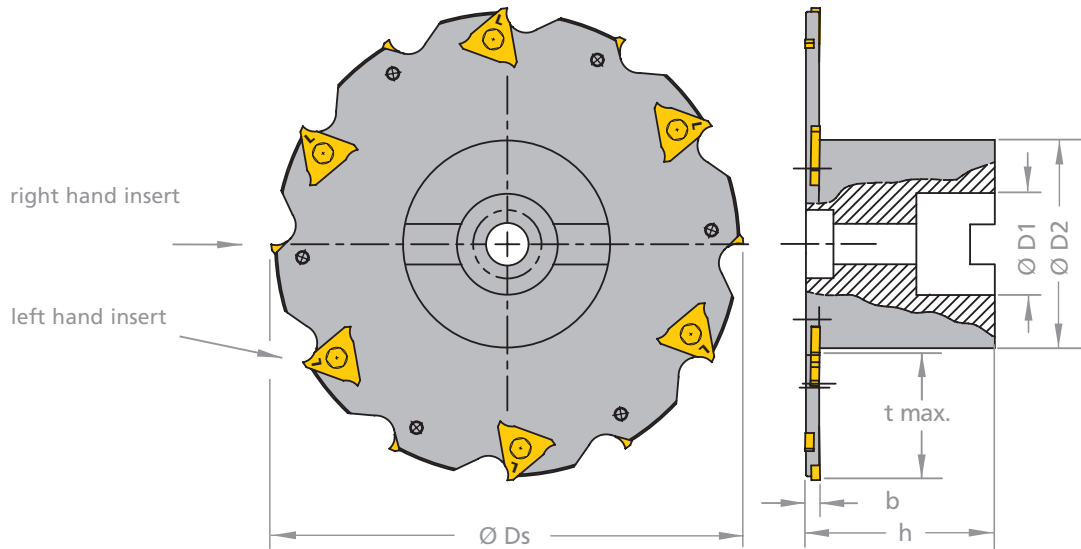
Type 591

high performance arbor mounted
slotting cutter
b = 3 + 4 + 5 mm

bore d1 with cross
keyway according DIN 138

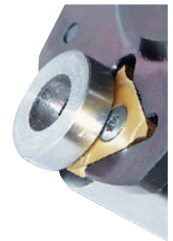
SYSTEM 500

groove milling
and slotting cutter



3 mm: torque = 0.7 Nm
4 + 5 mm: torque = 1.3 Nm

further sizes upon request
dimensions in mm



b	part number	Ø Ds cutting edge						Type R/L 510	insert type R/L 510
			Ø d1	Ø d2	b	h	t max.		
3	591.0080.16.3	80	16	28	3	50	25	R510.0317 (4x)	L510.0317 (4x)
3	591.0100.27.3	100	27	48	3	50	25	R510.0317 (5x)	L510.0317 (5x)
3	591.0125.27.3	125	27	48	3	50	37.5	R510.0317 (6x)	L510.0317 (6x)
3	591.0160.40.3	160	40	70	3	50	44	R510.0317 (8x)	L510.0317 (8x)
4	591.0080.16.4	80	16	28	4	50	25	R510.0423 (4x)	L510.0423 (4x)
4	591.0100.27.4	100	27	48	4	50	25	R510.0423 (5x)	L510.0423 (5x)
4	591.0125.27.4	125	27	48	4	50	37.5	R510.0423 (6x)	L510.0423 (6x)
4	591.0125.40.4	125	40	70	4	50	26.5	R510.0423 (6x)	L510.0423 (6x)
4	591.0160.27.4	160	27	48	4	50	55	R510.0423 (8x)	L510.0423 (8x)
4	591.0160.40.4	160	40	70	4	50	44	R510.0423 (8x)	L510.0423 (8x)
4	591.0180.40.4	180	40	70	4	50	54	R510.0423 (9x)	L510.0423 (9x)
4	591.0200.40.4	200	40	70	4	50	64	R510.0423 (10x)	L510.0423 (10x)
5	591.0100.27.5	100	27	48	5	50	25	R510.0528 (5x)	L510.0528 (5x)
5	591.0125.27.5	125	27	48	5	50	37.5	R510.0528 (6x)	L510.0528 (6x)



SYSTEM 500

groove milling
and slotting cutter

Type 590 / 591

spare parts
b = 3 + 4 + 5 mm

Type 590 spare parts

part number	width	screw	key
590.0080.27.3 590.0100.32.3 590.0125.40.3 590.0160.40.3	3 mm	025.03F	DSD-TX7/07
590.0080.27.4 590.0100.32.4 590.0125.40.4 590.0160.40.4	4 mm	035.04F	TR8
590.0080.27.5 590.0100.32.5 590.0125.40.5 590.0160.40.5	5 mm	035.05F	TR8

Type 591 spare parts

part number	screw	washer	width	screw	key
591.0080.16.3 591.0100.27.3 591.0125.27.3 591.0160.40.3	DIN912 - M8x40 DIN912 - M12x35 DIN912 - M12x35 DIN7984 - M20x40	DIN125-8.4/5 DIN 433-12-2 DIN 433-12-2 DIN 433-21-2	3 mm	025.03F	DSD-TX7/07
591.0080.16.4 591.0100.27.4 591.0125.27.4 591.0125.40.4 591.0160.27.4 591.0160.40.4 591.0180.40.4 591.0200.40.4	DIN912 - M8x40 DIN912 - M12x35 DIN912 - M12x35 DIN7984 - M20x40 DIN912 - M12x35 DIN7984 - M20x40 DIN7984 - M20x40 DIN7984 - M20x40	DIN125-8.4/5 DIN 433-13-2 DIN 433-13-2 DIN 433-21-3 DIN 433-13-2 DIN 433-21-3 DIN 433-21-3 DIN 433-21-3	4 mm	035.04F	TR8
591.0100.27.5 591.0125.27.5	DIN912 - M12x35 DIN912 - M12x35	DIN 433-13-2 DIN 433-13-2	5 mm	035.05F	TR8

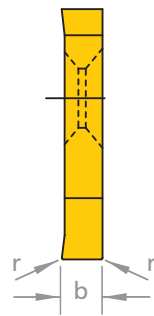
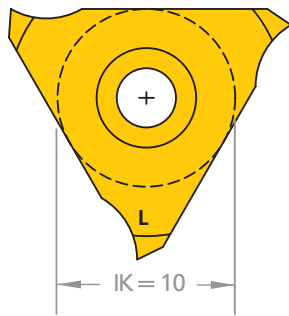
R/L 510

for slotting cutter type 590
arbor mounted slotting cutter type 591
and for milling cutter type 500.34.3-D

indexable grooving insert

SYSTEM 500

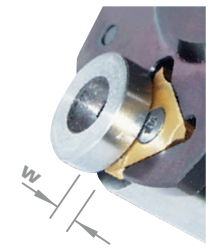
groove milling
and slotting cutter



L510. ...



R510. ...



state right (R) or left (L) version

dimensions in mm

part number	width of groove	width of groove		toolholder	standard carbide grade
		b	r		
R/L 510.0317	3	1.7	0.15	590.xxxx.xx.3 591.xxxx.xx.3	AL41F
R/L 510.0423	4	2.3	0.2	590.xxxx.xx.4 591.xxxx.xx.4 500.34.3-0	
R/L 510.0528	5	2.8	0.2	590.xxxx.xx.5 591.xxxx.xx.5 500.34.3-0	

More carbide grades you can find in the grades summary in the chapter »technical instructions« and in the price list.

order-example:
righthand version and grade AL41F:
R510.0317/AL41F



System 500

groove milling
by circular interpolation

Technical instructions,
evaluation the cutting data for groove milling



milling external

$$n = \frac{V_c \cdot 1000}{d \cdot \pi} \quad V_{\text{eff}} = f_z \cdot z \cdot n \quad f_z = h_m \sqrt{\frac{d}{a_e}}$$

$$V_{\text{prog}} = \frac{V_{\text{eff}} \cdot (D + d)}{D} \quad V_{\text{eff}} = \frac{D \cdot V_{\text{prog}}}{(D + d)}$$

milling internal

$$V_{\text{prog}} = \frac{V_{\text{eff}} \cdot (D - d)}{D} \quad V_{\text{eff}} = \frac{D \cdot V_{\text{prog}}}{(D - d)}$$

formula characters

specifications

unit

d	milling-diameter	mm
D	thread-diameter	mm
V_{eff}	feed rate of tool tip	mm/min
V_{eint}	programmed plunge feed	mm/min
V_{prog}	feed rate of tool center	mm/min
z	number of cutting edges	Pcs.

always plunge in a circular arc where possible.

when plunging straight use only 1/3 of the feed and do not traverse full feed until reaching the milling depth.

System 500

groove milling
and slotting cutter

Technical instructions,
evaluation the cutting data for groove milling
and slotting cutter

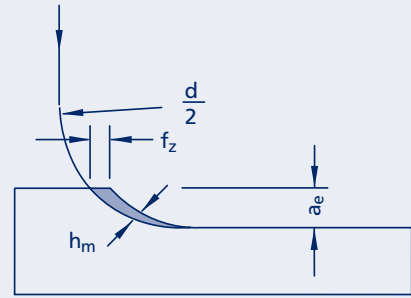


$$n = \frac{V_c \cdot 1000}{d \cdot \pi}$$

$$V_f = n \cdot z \cdot f_z \text{ mm/min}$$

$$f_z = h_m \sqrt{\frac{2r}{a_e}}$$

$$z = \frac{\text{quantity of cutting inserts}}{2}$$



formula characters

specifications

unit

a_e

radial depth of cut

mm

f_z

feed / tooth

mm

h_m

medium thickness of chip

mm

n

revolutions

U/min

r

radius of cutter

mm

V_c

cutting speeds

m/min

V_f

feed rate of tool center

mm/min

z

number of cutting edges

Pcs.



System 500

groove milling

by circular interpolation

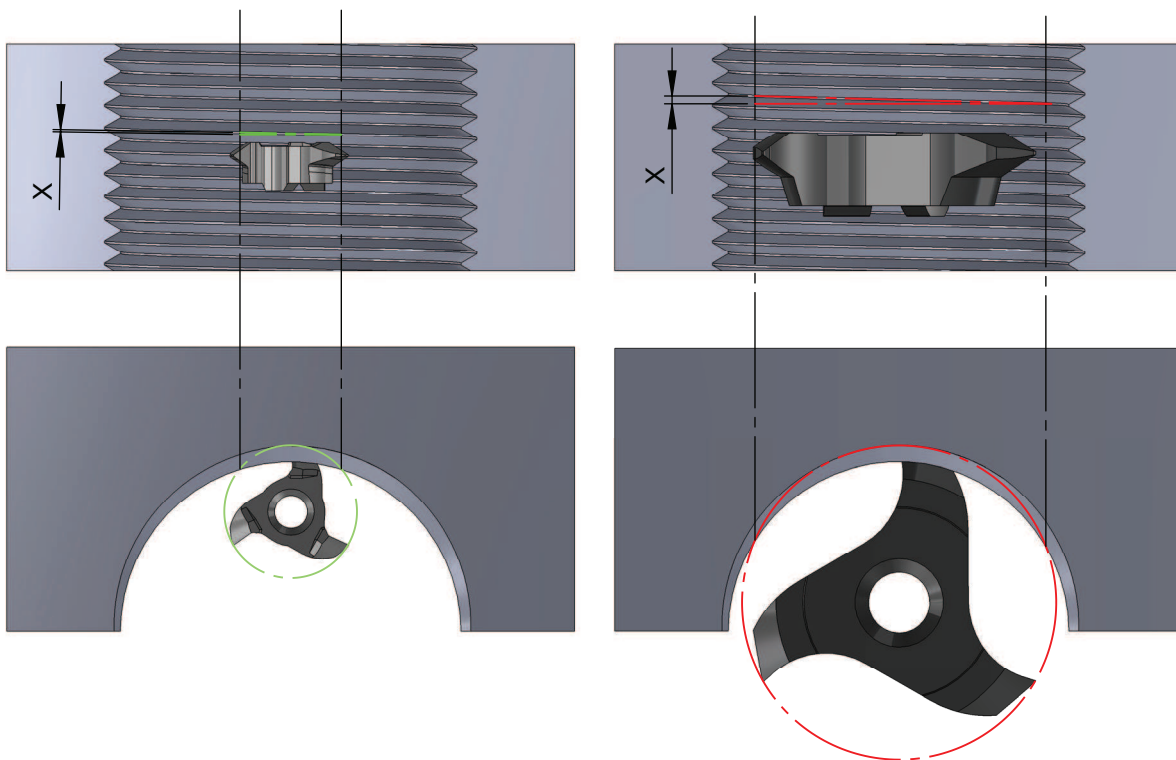
Basic information about thread milling

Thread profile violation

Thread milling by interpolation causes a profile violation. To keep the violation minimal you should use the cutting circle as small as possible.

The following sketch shows the relations during the process:

(green: profile violation X low = good; red: profile violation X big = bad)



System 500

groove milling

by circular interpolation

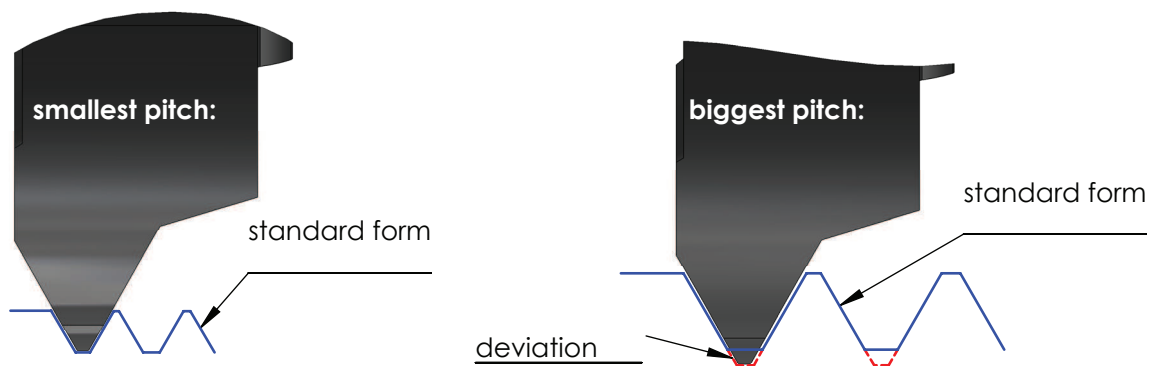
Basic information about thread milling



Partial profile

Tools with partial profile are multi-purpose tools, that means you can process several pitches with one tool. The processed shape has a small difference to the standard profile. Created is that tool for the smallest pitch, this profile depends to the standard.

All other pitches are producible, but only with a small deviation. Normally this causes no problem, but sometimes you have to decide case by case.





System 500

Nut- und Formfräsen

groove milling
by circular interpolation

Technische Hinweise

Hartmetallsorten und Beschichtungen

Technical instructions,
carbide grade and coatings

K10F

Universell einsetzbares Feinkornhartmetall mit guter Verschleißfestigkeit. Unbeschichtet geeignet für Anwendungen mit niedrigen und mittleren Schnittgeschwindigkeiten, sowie die Bearbeitung von Nicht-eisenmetallen.

All purpose micrograin carbide with good abrasion resistance. Uncoated for applications with low or medium cutting speeds and machining of nonferrous materials.

CBN

Zähe CBN-Sorte für Anwendungen mit niedrigen Schnittgeschwindigkeiten. Geeignet für gehärtete Stähle, unterbrochene Schnitte und Grauguss.

Ductile CBN grade for applications with lower cutting speed. Suitable for hardened steel, interrupted cuts and cast iron.

CN45F

Universell einsetzbare PVD-TIN-Beschichtung. Diese Allround-Sorte ist für niedrige und mittlere Schnittgeschwindigkeiten mit Einschränkung bei NE-Metallen.

All purpose PVD-TIN coating. This allround grade is suitable for low and medium cutting speed with restrictions on non-ferrous materials.

AL41F

Sehr universell einsetzbare TIALN-Beschichtung mit hoher Temperaturbeständigkeit bei hoher Härte. Sehr gut geeignet auch für NE-Metalle.

Very universal TIALN coating with a high resistance to high temperature and hardness. Very suitable also for non-ferrous metals.

PD2F

Beschichtung für den universellen Einsatz bei niedrigen und mittleren Schnittgeschwindigkeiten.

Coating for universal use with medium and low speed.

XC2A

Beschichtung mit einer excellenten Warmhärte, Oxidationsbeständigkeit und thermischen Isolationsfähigkeit. Ideal für Hartzerspannung >60HRC

Coating with excellent hot hardness, high oxidation resistance and thermal insulation capacity. Perfect for hard machining >60 HRC

System 500

Nut- und Formfräsen

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P01C

Beschichtung für die Bearbeitung in zähen Materialien bei niedrigen und mittleren Schnittgeschwindigkeiten.

Coating for the processing in tough material with medium or low cutting speed

P03C

Beschichtung für die Bearbeitung von schwer zerspanbaren Materialien. Sehr gut auch für die Trockenbearbeitung geeignet.

Coating for materials which are difficult to machine. Perfect to use for dry machining.

P07C

Beschichtung für die Bearbeitung von Titan und Edelstahl.

Coating to machine titanium and stainless steel.

P18C

Universell einsetzbare Hochleistungsschicht mit hoher Oxidationsbeständigkeit, Verschleißfestigkeit und Warmhärte.

Very universal high performance coating with high oxidation resistance, wear resistance and hot hardness resistance.

NEME

Beschichtung für die Bearbeitung von Aluminium, Al-Legierungen, NE-Metallen und Composite-Werkstoffen.

Coating for machining aluminium, alloys, non-ferrous metals and composite materials.



System 500

Nut- und Formfräsen

groove milling
by circular interpolation

Technische Hinweise

Schnittdaten

Technical instructions,
cutting data



	Werkstoff	Festigkeit	Werkstoff-Nr	Werkstoffbezeichnung	Werkstoff-Nr
P	Allgemeiner Baustahl	< 800 N/mm2	1.0037	St37-2	1.0570
	Automatenstahl	< 800 N/mm2	1.0718	9SMnPb28	1.0727
	Einsatzstahl unlegiert	< 800 N/mm2	1.0401	C15	1.0481
	Einsatzstahl legiert	< 1000 N/mm2	1.7331	16MnCr5 (EC80)	1.7015
	Vergütungsstahl unlegiert	< 850 N/mm2	1.0503	C45	1.1191
	Vergütungsstahl unlegiert	< 1000 N/mm2	1.0601	C60	1.1221
	Vergütungsstahl legiert	< 800 N/mm2	1.5131	50MnSi4	1.7030
	Vergütungsstahl legiert	< 1300 N/mm2	1.5755	31NiCr14	1.7033
	Stahlguss	< 850 N/mm2	0.9650	G-X260Cr27	1.6750
	Nitrierstahl	< 1000 N/mm2	1.8504	34CrAl6	1.8507
	Nitrierstahl	< 1200 N/mm2	1.8515	31CrMo12	1.8523
	Wälzlagerstahl	< 1200 N/mm2	1.3505	100Cr6 (W3)	1.3543
	Federstahl	< 1200 N/mm2	1.5026	55Si7	1.7176
	Schnellarbeitsstahl	< 1300 N/mm2	1.3344	S 6-5-3	1.3255
	Werkzeugstahl für Kaltarbeit	< 1300 N/mm2	1.2312	40CrMnMoS8 6	1.2379
	Werkzeugstahl für Warmbeit	< 1300 N/mm2	1.2343	X38CrMoV 5 1	1.2767
M	Stahl und Stahlguss rostfrei geschwefelt	< 850 N/mm2	1.4305	X8CrNiS18 9	1.4105
	Nichtrostender Stahl, ferritisch	< 750 N/mm2	1.4510	X3CrTi17	1.4528
	Nichtrostender Stahl, martensitisch	< 900 N/mm2	1.4034	X46Cr13	1.4116
	Nichtrost. Stahl, ferritisch/martensit.	<1100 N/mm2	1.4313	X3CrNi13-4	1.4028
	Nichtrost. Stahl, austenitisch/ferritisch	< 850 N/mm2	1.4460	X8CrNiMo27 5	1.4821
	Nichtrostender Stahl, austenitisch	< 750 N/mm2	1.4301	X5CrNi18-10	1.4571
K	Hitzebeständig	< 1100 N/mm2	1.4747	X80CrNiSi20	1.4876
	Grauguss mit Lammellengraphit	100-350N/mm2	0.6010	GG10	0.6025
	Grauguss mit Lammellengraphit	300-1000N/mm2	0.6030	GG30	0.6045
	Kugelgraphitguss	300-500N/mm2	0.7040	GGG40	0.7050
	Kugelgraphitguss	550-800N/mm2	0.7060	GGG60	0.7080
	Temperguss weis	350-450N/mm2	0.8035	GTW35	0.8045
	Temperguss weis	500-650N/mm2	0.8055	GTW55	0.8065
	Temperguss schwarz	350-450N/mm2	0.8135	GTS35	0.8145
N	Temperguss schwarz	500-700N/mm2	0.8155	GTS55	0.8170
	Aluminium (unlegiert, niedrig legiert)	< 350 N/mm2	3.0255	Al99,5	3.3308
	Aluminiumlegierungen < 0,5% Si	< 500 N/mm2	3.0515	AlMn1	3.1355
	Aluminiumlegierungen 0,5-10% Si	< 400 N/mm2	3.2152	GD-AlSi6Cu4	3.2373
	Aluminiumlegierungen 10-15% Si	< 400 N/mm2	3.2381	G-AlSi10Mg	3.5562
	Aluminiumlegierungen > 15% Si	< 400 N/mm2		G-AlSi17Cu4	
	Kupfer (unlegiert, niedrig legiert)	< 350 N/mm2	2.0060	E-Cu57	2.0090
	Kupfer-Knetlegierungen	< 700 N/mm2	2.0240	CuZn15	2.0265
	Kupfer-Sonderlegierungen	< 200 HB	2.0916	CuAl5	2.1525
	Kupfer-Sonderlegierungen	< 300HB	2.0978	CuAl11Ni6Fe5	
	Kupfer-Sonderlegierungen	> 300 HB	2.1247	CuBe2F125	
	Messing kurzspanend, Bronze, Rotguss	< 600 N/mm2	2.0360	CuZn40 (Ms60)	2.0380
	Messing langspanend	< 600 N/mm2	2.0335	CuZn36 (Ms63)	2.1293
	Thermoplaste			Delrin, Hostalen	
	Duroplaste			Ferrozell, Bakelit	
	Faserverstärkte Kunststoffe			GFK (Glasfaserverstärkt)	
	Magnesium und Magnesiumlegierungen	< 850 N/mm2	3.5200	M2, MgMn2	3.5612
	Graphit			C8000, R8500X	
Wolfram und Wolframlegierungen			W-NiFe (Densimet W)		
Molybdän und Molybdänlegierungen			Mo , Mo-50Re		
S	Reinnickel		1.3911	RNi24	1.3927
	Nickellegierungen		1.3912	Ni36 (Invar)	1.3924
	Nickellegierungen	< 850 N/mm2	2.4360	S-NiCu 30 Fe	
	Nickel-Chromlegierungen		2.4886	SG-NiMo16Cr16W	2.4610
	Nickel- und Kobaltlegierungen	< 1300 N/mm2	2.4632	NiCr20Co18Ti	2.4631
	Nickel- und Kobaltlegierungen	< 1300 N/mm2	2.4634	NiCo20Cr15MoAlTi	2.4654
	Hochwärmefeste Legierungen	< 1300 N/mm2		Hardox 400	1.4939
	Nickel-Kobalt-(Chrom-)legierungen	< 1400 N/mm2	2.4806	SG-NiCr20Nb, Inconel 82	2.4851
	Reintitan	< 900 N/mm2	3.7025	Ti99,8	3.7034
	Titanlegierungen	< 700 N/mm2	3.7114	TiAl5Sn2	3.7174
	Titanlegierungen	< 1200 N/mm2	3.7164	TiAl5V4	3.7144
H	Stahl gehärtet	< 45 HRc			
		46-55HRc			
		56-60 HRc			
		61-65 HRc			
	65-70 HRc				

System 500

Nut- und Formfräsen

groove milling
by circular interpolation

Technische Hinweise

Schnittdaten

Technical instructions,
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Werkstoffbezeichnung	Werkstoff- Nr	Werkstoffbezeichnung	Vc (m/min.)	fz (mm)	
St52-3	1.0060	St60-2	160-240	0,05 - 0,15	Haupt-Anwendung
45S20	1.0757	46SPb2		0,05 - 0,15	
17Mn4	1.1141	C15E (CK15)		0,05 - 0,15	
13Cr3 (EC60)	1.5919	15CrNi6	70-150	0,05 - 0,12	
Ck45	1.0535	C55	0,05 - 0,12		
Ck60	1.0540	C50	0,05 - 0,12		
28Cr4	1.7225	42CrMo4	50-70	0,05 - 0,15	
34Cr4	1.3565	48CrMo4	0,02 - 0,1		
GS-20NiCrMo3 7	1.6582	GS-34 CrNiMo 6	0,05 - 0,15		
34AlMo5	1.8509	41CrAlMo7	0,03 - 0,12		
39CrMoV19 3	1.8550	34 CrAlNi 7	0,02 - 0,1		
X192CrMo17	1.3520	100 CrMn 6 (W4)	80-120	0,02 - 0,1	
55Cr3	1.7701	51CrMoV4	0,02 - 0,1		
S 18-1-2-5	1.3294	PMH56-5-3-8; ASP30	0,02 - 0,1		
X155CrVMo12 1	1.2316	X38CrMo16; RAMAX	0,02 - 0,1		
X45NiCrMo4	1.2842	90MnCrV8	0,02 - 0,1		
X4CrMoS18	1.4107	GX8CrNi12	60-130	0,03 - 0,12	
X105CrCoMo18 2	1.4016	X6Cr17	0,05 - 0,15		
X50CrMoV15	1.4106	X2CrMoSi18-2-1	0,02 - 0,1		
X30Cr13	1.4104	X14CrMoS17	0,02 - 0,1		
X20CrNiSi25 4	1.4462	X2CrNiMoN22-5-3 (Duplex)	0,02 - 0,1		
X6CrNiMoTi17 12 2	1.4449	X3CrNiMo18-12-3	0,02 - 0,1		
X10NiCrAlTi32-21	1.4825	GX25CrNiSi18-9	0,02 - 0,1		
GG25			80-150	0,03 - 0,15	
GG45			0,03 - 0,15		
GGG50			0,03 - 0,15		
GGG80			0,03 - 0,15		
GTW45			0,03 - 0,15		
GTW65			0,03 - 0,15		
GTS45			0,03 - 0,15		
GTS70			0,03 - 0,15		
Al99,9Mg0,5	3.0256	E-Al H	500-700	0,05 - 0,15	
AlCuMg2	3.3315	AlMg1	0,05 - 0,15		
GD-AlSi9Mg	3.2134	GD-AlSi5Cu1Mg	0,05 - 0,15		
G-MgAl6	3.2525	S-AlSi12	0,05 - 0,15		
G-AlSi25CuNiMg		G-AlSi21CuNiMg	0,05 - 0,15		
SF-Cu	2.1522	CuSi2Mn	200-500	0,05 - 0,15	
CuZn30	2.0321	CuZn37	0,05 - 0,15		
CuSi3Mn		Ampco 8-16	0,05 - 0,15		
		Ampco18-26	0,05 - 0,15		
		Ampco M-4	0,05 - 0,15		
CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2	80-220	0,05 - 0,15	
CuCrZr	2.1080	CuSn6Zn6	0,05 - 0,15		
Makrolon, Novodur		Acrylglas, Polystyrol		0,05 - 0,25	
Pertinax		Resopal		0,05 - 0,25	
CFK (Kohlefaserverstärkt)		AFK (Amidfaserverstärkt)	100-350	0,05 - 0,15	
MgAl6Zn1	3.5812	MgAl8Zn1	0,02 - 0,1		
R8650		Technograph15	0,05 - 0,15		
W-Cu80/20		W93NiFe (DENAL)	0,02 - 0,1		
TZC, TZM		MHC, ODS	0,02 - 0,1		
RNi8	1.3926	RNi12	40-120	0,005 - 0,07	
Ni54	1.3921	Ni49	0,005 - 0,07		
NiCu 30 Fe		Monel 400	0,005 - 0,07		
NiMo16Cr16Ti		Hastelloy C-276	0,005 - 0,07		
NiCr20TiAl		Nimonic 80	0,005 - 0,07		
NiCr19Co14Mo4Ti		Waspaloy	0,005 - 0,07		
X12CrNiMo12	1.4980	X6NiCrTiMoVB25-15-2	0,005 - 0,07		
NiCr23Fe, Inconel 601	2.4667	SG-NiCr19NbMoTi	0,005 - 0,07		
Ti99,7	3.7064	Ti99,5	0,005 - 0,07		
TiAl6V6Sn2	3.7124	TiCu2	0,005 - 0,07		
TiAl6Sn2Zr4Mo2	3.7154	TiAl6Zr5	0,005 - 0,07		
			30-80	0,003 - 0,05	
				0,002 - 0,05	
				0,001 - 0,05	
			-	-	
			-	-	

