
KIMU

Face milling cutters - Fraises à surfacer - Planmesserköpfe

Code key - Système de codification - Kodifizierungs-System K02
Technical information - Information technique - Technische Auskunft K04
Applications - Applications - Anwendungen K05
Face milling cutters - Fraises à surfacer - Planmesserköpfe K06
Cutting data - Conditions de coupe - Schnittdaten K14

Facing square shoulder cutters - Fraises à surfacer et à dresser - Eckfräser

Technical information - Information technique - Technische Auskunft K16
Applications - Applications - Anwendungen K17
Face square shoulder cutters - Fraises à surfacer et à dresser - Eckfräser K18
Cutting data - Conditions de coupe - Schnittdaten K31

Slot cutters - Fraises disque - Scheibenfräser

Technical information - Information technique - Technische Auskunft K33
Applications - Applications - Anwendungen K34
Code key - Système de codification - Kodifizierungs-System K35
Slot cutters - Fraises disque - Scheibenfräser K36
Cutting data - Conditions de coupe - Schnittdaten K41

Porcupine cutters - Coupeurs de porc-épic - Stachelschweinscherblöcke

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Applications - Applications - Anwendungen K43
Porcupine cutters - Coupeurs de porc-épic - Stachelschweinscherblöcke K44
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Specific applications and kits - Applications et ensembles spécifiques - Spezifische Anwendungen und Sätze

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Profile milling - Fraisage de profil - Profilprägen

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Round inserts - Insertions rondes - Runde Einsätze K74
Aluminium die cutting - Découpage d'aluminium - Aluminium Stempelschneiden K78

KIMU

1

01	90°	02	90°
03	90°	04	75°
05		06	45°
07	45°	08	90°
09	92°	11	90°
12	90°	13	
14	75°	15	
16		17	45°
18	42°	19	
22		23	
25		29	
30		33	95°
35		55	
85		88	
89		96	

2

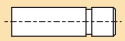
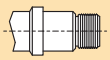
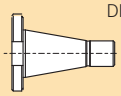
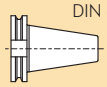
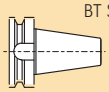
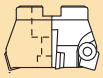
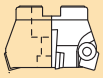
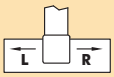
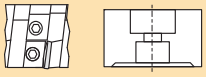
1		80° 6		4		
2	11	80° 8		6		
3	16	9	80° 9	75° 8		
4	22	12	80° 12	75° 12		
5		15				
6		19				
8						
9						

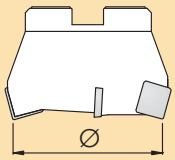
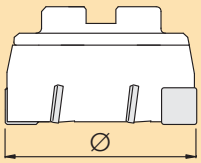
1		3				
2	8	4		10		
3	10	5	15	16	10	
4	12	6	15	20	12	
5	16	8			16	
6	20				20	
8					25	
9					32	

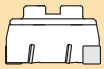
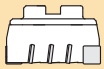
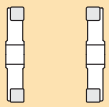
3

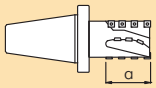
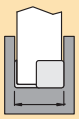
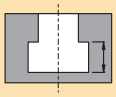
0		11°
2		0°
4		7°
5		15°
6		25°
7		30°
8		20°
9	ØM	11°

0 4 **4** **0**

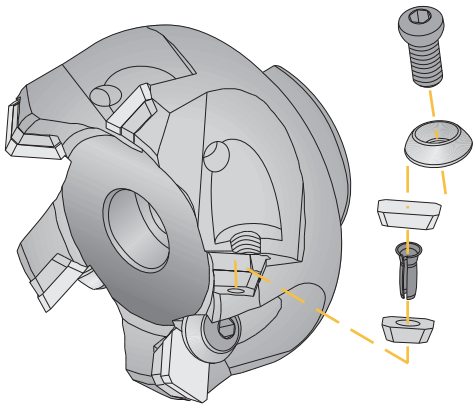
4	
Short cylindric  Ø16 Ø20 Ø25 **00**	Long cylindric  Ø20 Ø25 Ø32 | Ø20 Ø25 Ø32 **01** | **02**
Short cylindric  Ø16 Ø20 Ø25 **03**	Modular shank  Ø46 M27 **06**
Short Weldon  Ø12 Ø16 Ø20 Ø25 Ø32 Ø40 **07** | **21**	Long Weldon  Ø12 Ø16 Ø20 Ø25 Ø32 Ø40 **27**
Short Morse DIN 228  M2-M3 | M4 | M5 **30** | **34** | **35**	Long Morse DIN 228  M3 | M4 **32** | **36**
ISO DIN 2080  ISO 30 | ISO 40 | ISO 50 **43** | **44** | **45**	ISO 7388 DIN 69871 A  7388 40 | 7388 50 **47** | **48**
ISO BT System  BT 40 | BT 50 **49** | **50**	R-8 Bridgeport shank  ***R-8*** **80**
Direct spindle mounting  **90**	Direct spindle mounting  **93**
Direct spindle mounting  **95**	Cutting hand  **96**
Direct spindle mounting  **99**	

Diameter, mm.
   

Coarse pitch	Fine pitch	Cutting hand
		
0	**1**	**R** | **L**
*		

Cutting length	Cutting width	Cutting depth
		

99 **125** **1** * **24** **



C Clamp

This classic positive insert clamping system allows the use of all models presenting this geometry, both with additional chipbreaker and sintered.

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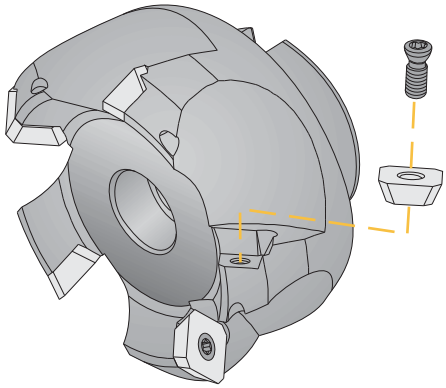

Screw clamping

Since the advent of the Torx screw it has been possible to hold with complete safety positive inserts with centre hole. Our range covers all the screw clamping permutations.

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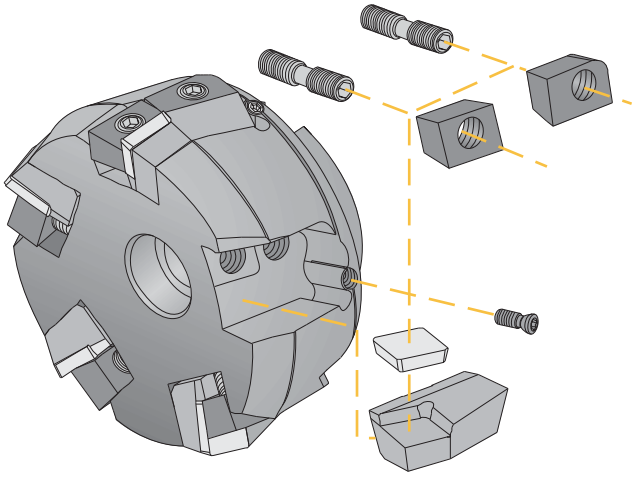

Wedge clamping

Heavy duty work require good fixation, for this purpose we have designed our wedge clamping system, one of the safest available.

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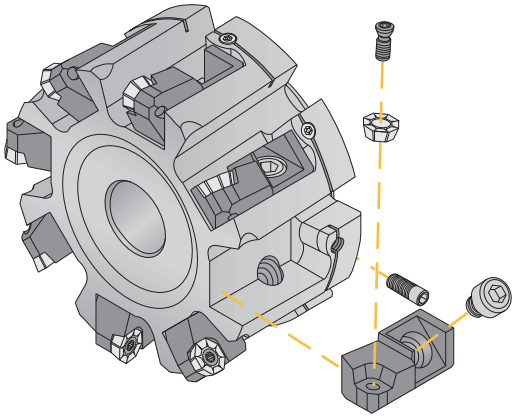


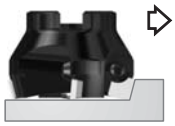
Cartridge system

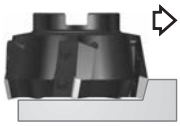
Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

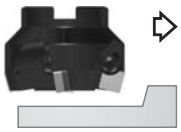
Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

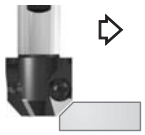
Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

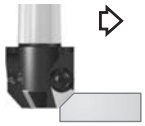
Face milling cutters - Fraises à surfacer - Planmesserköpfe

131 75°
General application 75°

Page K.06 SP.. 1203..

300-301 75°
General application 75°

Page K.06 SP.. 1203.. SP.. 1504..

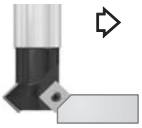
171 75°
Deep cutting 75°

Page K.06 SN.. 1204..

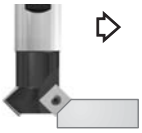
631 45°
Chamfering 45°

Page K.08 TPUN 1103.. TPUN 1603..

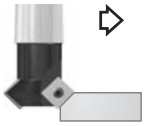
632 45°
Chamfering 45°

Page K.08 TPUN 1603..

141 45°
Facing and chamfering 45°

Page K.08 TPUN 1603..

239 45°
Chamfering 45°

Page K.09 SPM.. 1204..

240 45°
Chamfering 45°

Page K.09 SPM.. 1204..

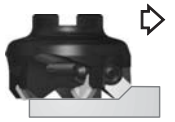
241 45°
Chamfering 45°

Page K.09 SPM.. 1204..

271 45°
Facing and chamfering 45°

Page K.10 SC.. 1204..

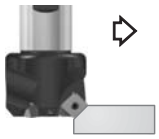
191 45°
First choice 45°

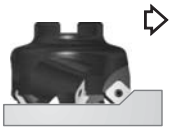
Page K.10 SEK.. 1203..

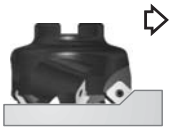
192 45°
First choice 45°

Page K.10 SEK.. 1204..

341-342 45°
General application 45°

Page K.11 SEK.. 1203..

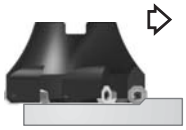
214 45°
Facing and chamfering 45°

Page K.11 SEH.. 1204..

291 45°
Soft materials 45°

Page K.11 SEH.. 1204..

293 45°
Soft materials 45°

Page K.12 SEH.. 1204..

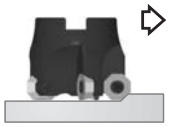
294 45°
Soft materials 45°

Page K.12 SEH.. 1204..

292 42°
Multipurpose milling 42°

Page K.12 ODM.. 0404..

295 42°
Multipurpose milling 42°

Page K.13 ODM.. 0404..

296 42°
Multipurpose milling 42°

Page K.13 ODM.. 0605..

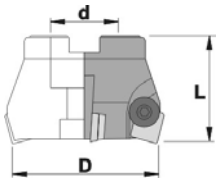
297 42°
Multipurpose milling 42°

Page K.13 ODM.. 0605..

KIMU

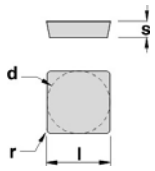
131 75°

REF.	D	d	L	Z	SP..					
131.050.Z=3	50	22	40	3	1203..	206	504	-	-	910
131.050	50	22	40	4	1203..	206	504	-	-	910
131.063	63	27	50	4	1203..	206	504	312	103	912
131.080	80	27	50	5	1203..	206	504	312	103	912
131.100	100	32	50	6	1203..	206	504	312	103	917
131.125	125	40	63	6	1203..	206	504	312	103	920
131.160	160	40	63	7	1203..	206	504	312	103	952
131.200	200	60	63	8	1203..	206	504	312	103	956



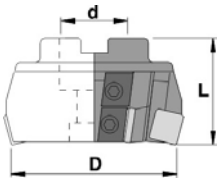
REF.	l	s	d
SPUN 1203..	12,70	3,18	12,70

For more information see page: A.50,51



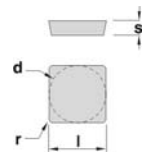
300-301 75°

REF.	D	d	L	Z	SP..						
300.080	80	27	50	5	1203..	647	648	177	522	694	912
300.100	100	32	50	7	1203..	647	648	177	522	694	920
300.125	125	40	63	8	1203..	647	648	177	522	694	-
300.160	160	40	63	10	1203..	647	648	177	522	694	952
300.200	200	60	63	12	1203..	647	648	177	522	694	956
300.250	250	60	63	16	1203..	647	648	177	522	694	956
300.315	315	60	63	20	1203..	647	648	177	522	694	956
300.400	400	60	63	26	1203..	647	648	177	522	694	956
300.500	500	60	63	34	1203..	647	648	177	522	694	956
301.100	100	32	50	7	1504..	639	640	177	522	615	917
301.125	125	40	63	8	1504..	639	640	177	522	615	-
301.160	160	40	63	10	1504..	639	640	177	522	615	952
301.200	200	60	63	12	1504..	639	640	177	522	615	956
301.250	250	60	63	16	1504..	639	640	177	522	615	956
301.315	315	60	63	20	1504..	639	640	177	522	615	956
301.400	400	60	63	26	1504..	639	640	177	522	615	956
301.500	500	60	63	34	1504..	639	640	177	522	615	956

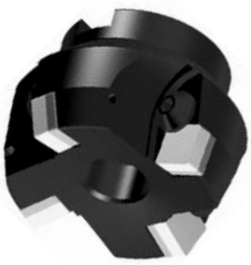


REF.	l	s	d
SP.. 1203..	12,70	3,18	12,70
SP.. 1504..	15,88	4,76	15,88

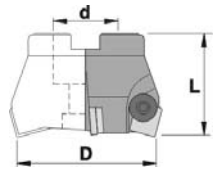
For more information see page: A.50,51



171 75°

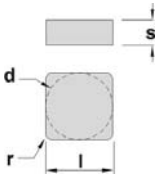


REF.	D	d	L	Z	SNUN					
171.050	50	22	40	3	1204..	206	504	-	-	910
171.063	63	27	50	4	1204..	206	504	332	103	912
171.080	80	27	50	5	1204..	206	504	332	103	916
171.100	100	32	50	6	1204..	206	504	332	103	916



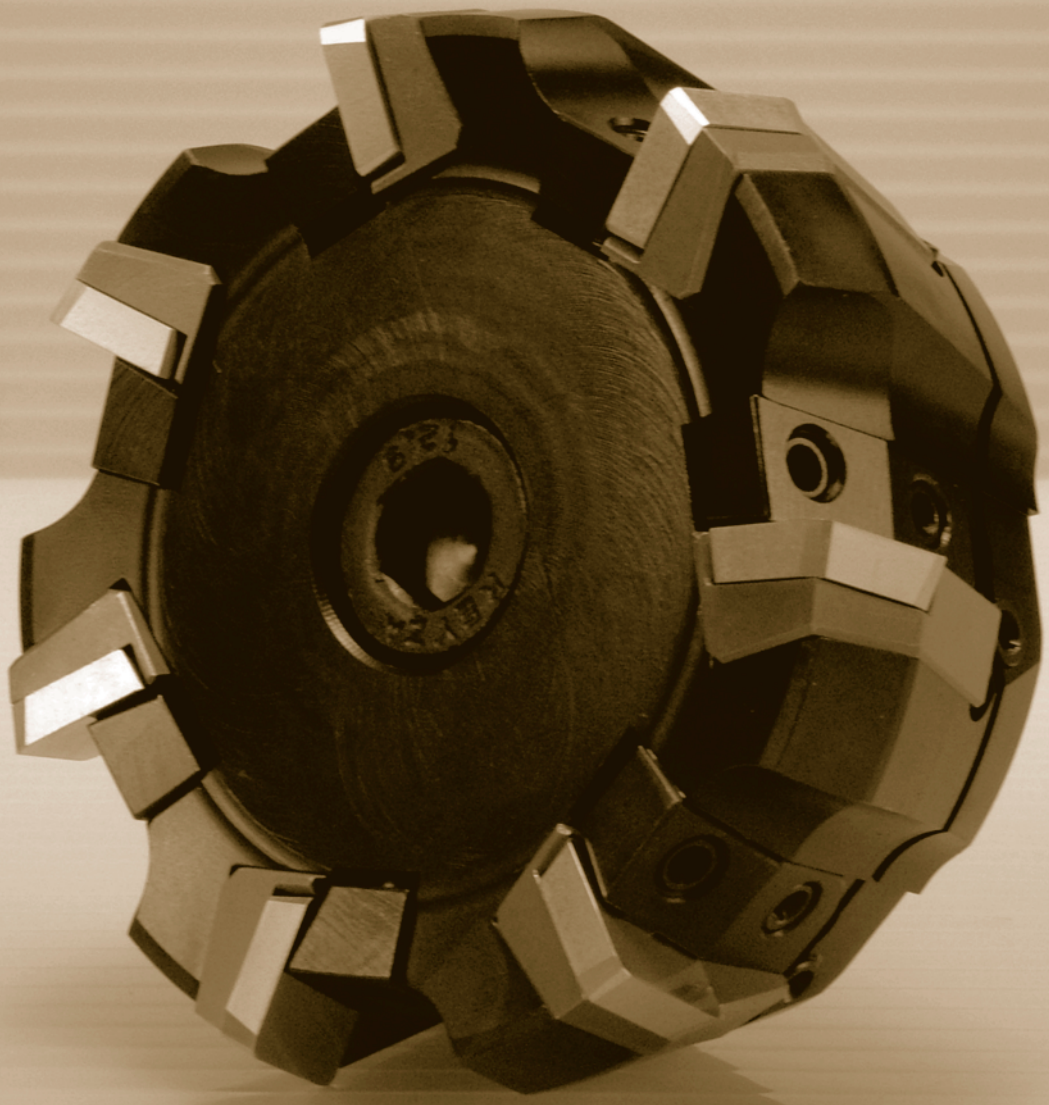
REF.	l	s	d
SNUN 1204..	12,70	4,76	12,70

For more information see page: A.49,50



300 - 301

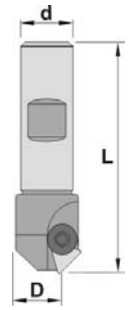
Positive milling cutter with 75° entering angle. Its strong inserts accept high cutting depths and high feed per teeth. The fixing system by wedge ensures an excellent fixation of the insert and a higher security on difficult conditions. The indexable cartridges protect the milling cutter body in case of accident. This face milling cutter works well on steels, stainless steel, alloyed steels, cast iron and aluminium alloys. This general purpose milling cutter is recommended for manual machines as well as for C.N.C. machines. It is a good choice for economical machining since the SPUN type insert can be fitted. The axial regulation screw allows a perfect adjustment for super-finishing Aplicacions.



KIMU

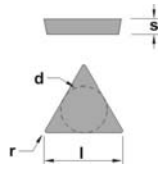
631 45°

REF.	D	d	L	Z	TPUN		
631.016	16	12	80	1	1103..	125	503
631.020	20	20	85	1	1103..	125	503
631.032	32	20	90	2	1603..	126	504
631.040	40	20	90	3	1603..	126	504



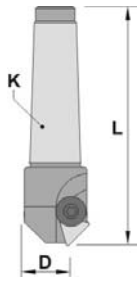
REF.	l	s	d
TPUN 1103..	11,00	3,18	6,35
TPUN 1603..	16,50	3,18	9,52

For more information see page: A.55



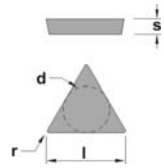
632 45°

REF.	D	K	L	Z	TPUN		
632.032	32	MK3	125	2	1603..	126	504
632.040	40	MK3	125	3	1603..	126	504
632.050	50	MK3	125	3	1603..	126	504



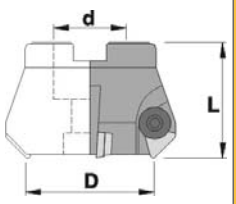
REF.	l	s	d
TPUN 1603..	16,50	3,18	9,52

For more information see page: A.55



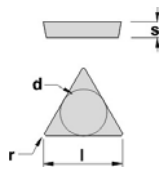
141 45°

REF.	D	d	L	Z	TPUN					
141.040	40	27	40	3	1603..	206	504	-	-	912
141.050	50	27	40	4	1603..	206	504	-	-	912
141.063	63	27	50	4	1603..	206	504	316	103	912



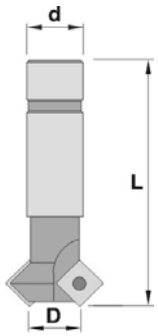
REF.	l	s	d
TPUN 1603..	16,50	3,18	9,52

For more information see page: A.55



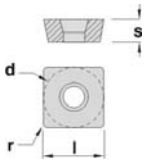
239 45°

REF.	D	d	L	Z	SPM..		
239.005	6,5	20	110	1	1204..	159	520
239.020	20,0	25	125	2	1204..	159	520



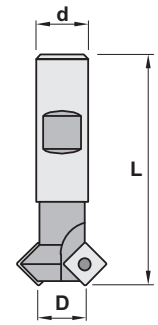
REF.	l	s	d
SPM.. 1204..	12,70	4,76	12,70

For more information see page: A.51



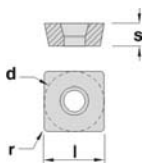
240 45°

REF.	D	d	L	Z	SPM..		
240.005	6,5	25	110	1	1204..	159	520
240.020	20,0	25	110	2	1204..	159	520



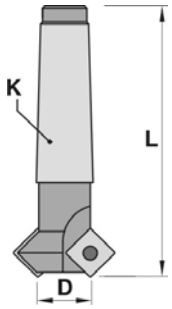
REF.	l	s	d
SPM.. 1204..	12,70	4,76	12,70

For more information see page: A.51



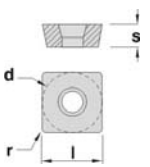
241 45°

REF.	D	K	L	Z	SPM..		
241.005	6,5	MK3	125	1	1204..	159	520
241.020	20,0	MK3	125	2	1204..	159	520



REF.	l	s	d
SPM.. 1204..	12,70	4,76	12,70

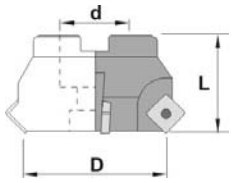
For more information see page: A.51



KIMU

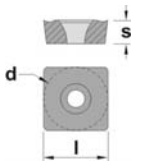
271 45°

REF.	D	d	L	Z	SC..			
271.040	40	16	40	4	1204..	150	522	108
271.050	50	22	40	4	1204..	150	522	910
271.063	63	27	50	5	1204..	150	522	912
271.080	80	32	50	6	1204..	150	522	916
271.100	100	40	50	7	1204..	150	522	-
271.125	125	40	63	8	1204..	150	522	-
271.160	160	40	63	9	1204..	150	522	952
271.200	200	60	63	11	1204..	150	522	956



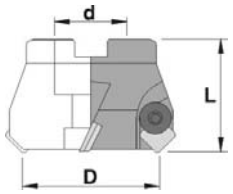
REF.	l	s	d
SC.. 1204..	12,70	4,76	12,70

For more information see page: A.47,48



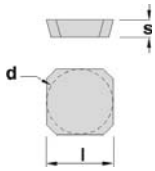
191 45°

REF.	D	d	L	Z	SEKN					
191.050	50	22	40	4	1203..	226	504	352	103	910
191.063	63	22	50	5	1203..	226	504	352	103	910
191.080	80	27	50	6	1203..	226	504	352	103	912
191.100	100	32	50	6	1203..	226	504	352	103	916
191.125	125	40	63	7	1203..	226	504	352	103	-
191.160	160	40	63	8	1203..	226	504	352	103	952
191.200	200	60	63	10	1203..	226	504	352	103	956



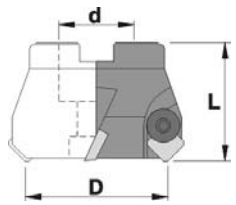
REF.	l	s	d
SEKN 1203..	12,70	3,18	12,70

For more information see page: A.48



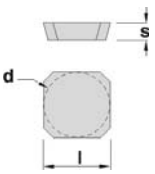
192 45°

REF.	D	d	L	Z	SEKN			
192.050	50	22	40	4	1204..	226	504	910
192.063	63	22	50	5	1204..	226	504	910
192.080	80	27	50	6	1204..	226	504	912
192.100	100	32	50	6	1204..	226	504	916
192.125	125	40	63	7	1204..	226	504	-
192.160	160	40	63	8	1204..	226	504	956



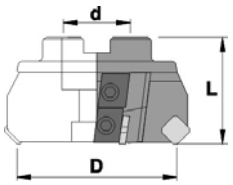
REF.	l	s	d
SEKN 1204..	12,70	4,76	12,70

For more information see page: A.48



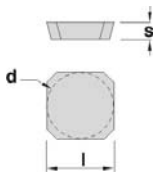
341-342 45°

REF.	D	d	L	Z	SEK..						
341.080	80	27	50	6	1203..	604	605	177	522	632	912
341.100	100	32	50	8	1203..	604	605	177	522	632	917
341.125	125	40	63	8	1203..	604	605	177	522	632	-
341.160	160	40	63	10	1203..	604	605	177	522	632	952
341.200	200	60	63	12	1203..	604	605	177	522	632	956
341.250	250	60	63	16	1203..	604	605	177	522	632	956
342.080	80	27	50	6	1504..	608	609	177	522	692	912
342.100	100	32	50	8	1504..	608	609	177	522	692	917
342.125	125	40	63	8	1504..	608	609	177	522	692	-
342.160	160	40	63	10	1504..	608	609	177	522	692	952
342.200	200	60	63	12	1504..	608	609	177	522	692	956
342.250	250	60	63	16	1504..	608	609	177	522	692	956



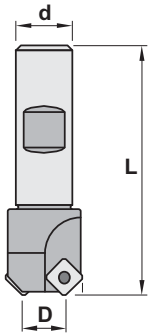
REF.	l	s	d
SEK.. 1203..	12,70	3,18	12,70
SEK.. 1504..	15,88	4,76	15,88

For more information see page: A.48,49



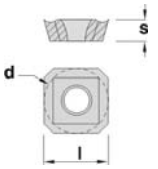
214 45°

REF.	D	d	L	Z	SEH..		
214.032	32	32	125	2	1204..	159	520
214.040	40	32	125	3	1204..	159	520



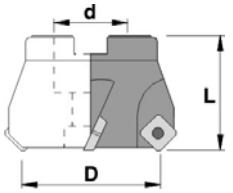
REF.	l	s	d
SEH.. 1204..	12,70	4,76	12,70

For more information see page: A.48



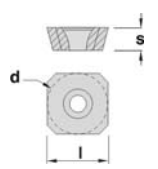
291 45°

REF.	D	d	L	Z	SEH..			
291.050	50	22	40	4	1204..	159	522	910
291.063	63	22	50	5	1204..	159	522	910
291.080	80	27	50	6	1204..	159	522	912
291.100	100	32	50	6	1204..	159	522	917
291.125	125	40	63	7	1204..	159	522	-
291.160	160	40	63	8	1204..	159	522	952
291.200	200	60	63	10	1204..	159	522	956



REF.	l	s	d
SEH.. 1204..	12,70	4,76	12,70

For more information see page: A.48

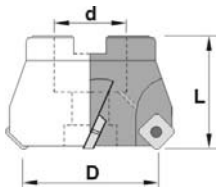


KIMU

293 45°

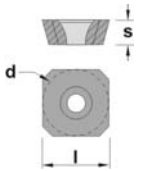
REF.	D	d	L	Z	SEH..			
293.050	50	22	40	4	1204..	159	522	910
293.063	63	22	50	5	1204..	159	522	910
293.080	80	27	50	6	1204..	159	522	912
293.100	100	32	50	6	1204..	159	522	917
293.125	125	40	63	7	1204..	159	522	-

Internal coolant system



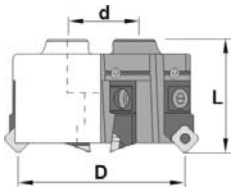
REF.	l	s	d
SEH.. 1204..	12,70	4,76	12,70

For more information see page: A.48



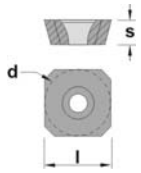
294 45°

REF.	D	d	L	Z	SEH..					
294.160	160	40	63	10	1204..	159	522	674	187	460	952
294.200	200	60	63	12	1204..	159	522	674	187	460	956
294.250	250	60	63	16	1204..	159	522	674	187	460	956
294.315	315	60	63	20	1204..	159	522	674	187	460	956
294.400	400	60	63	22	1204..	159	522	674	187	460	956
294.500	500	60	63	28	1204..	159	522	674	187	460	956



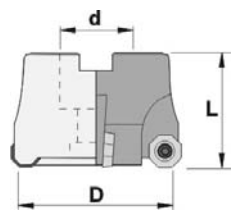
REF.	l	s	d
SEH.. 1204..	12,70	4,76	12,70

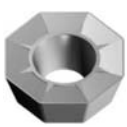
For more information see page: A.48



292 42°

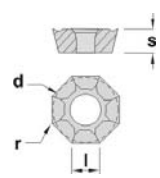
REF.	D	d	L	Z	ODM..			
292.040	40	16	40	4	0404..	144	535	108
292.050	50	22	40	4	0404..	144	535	910
292.063	63	27	50	5	0404..	144	535	912
292.080	80	32	50	6	0404..	144	535	916
292.100	100	40	50	7	0404..	144	535	920
292.125	125	40	63	7	0404..	144	535	-
292.160	160	40	63	8	0404..	144	535	952
292.200	200	60	63	10	0404..	144	535	956





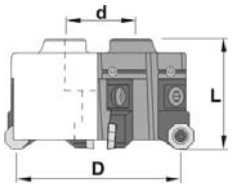
REF.	l	s	d
ODM.. 0404..	4,0	4,76	12,70

For more information see page: A.45



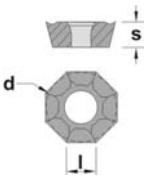
295 42°

REF.	D	d	L	Z	ODM..					
295.160	160	40	63	10	0404..	140	535	685	187	460
295.200	200	60	63	12	0404..	140	535	685	187	460
295.250	250	60	63	16	0404..	140	535	685	187	460
295.315	315	60	63	20	0404..	140	535	685	187	460
295.400	400	60	63	22	0404..	140	535	685	187	460
295.500	500	60	63	28	0404..	140	535	685	187	460



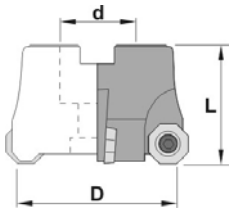
REF.	l	s	d
ODM.. 0404..	4,00	4,76	12,70

For more information see page: A.45



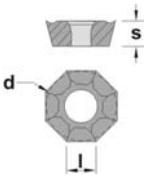
296 42°

REF.	D	d	L	Z	ODM..			
296.063	63	27	50	-	0605..	155	522	912
296.080	80	32	50	-	0605..	155	522	917
296.100	100	40	50	-	0605..	155	522	-
296.125	125	40	63	8	0605..	155	522	-
296.160	160	40	63	10	0605..	155	522	952
296.200	200	60	63	12	0605..	155	522	956



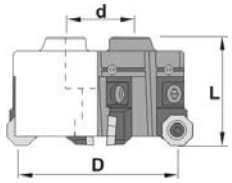
REF.	l	s	d
ODM.. 0605..	6,00	5,55	16,00

For more information see page: A.45



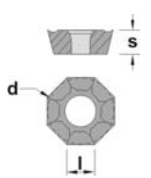
297 42°

REF.	D	d	L	Z	ODM..						
297.160	160	40	63	10	0605..	159	522	686	187	460	952
297.200	200	60	63	12	0605..	159	522	686	187	460	956
297.250	250	60	63	16	0605..	159	522	686	187	460	956
297.315	315	60	63	20	0605..	159	522	686	187	460	956
297.400	400	60	63	22	0605..	159	522	686	187	460	956
297.500	500	60	63	28	0605..	159	522	686	187	460	956



REF.	l	s	d
ODM.. 0605..	6,00	5,55	16,00

For more information see page: A.45

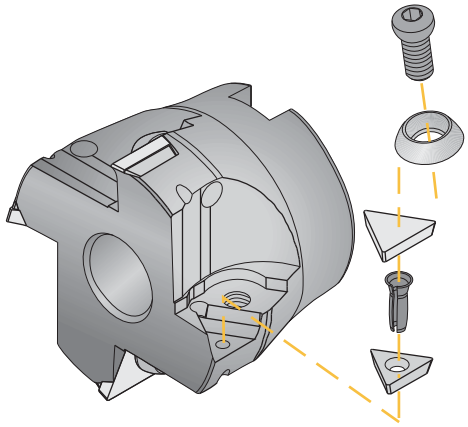


Cutting data for face milling cutters

Material P	HB	Condition	Cutting speed m/min.			
			TIN25	TIN41	PM25	PM40
			0.3-0.2-0.1	0.3-0.2-0.1	0.4-0.2-0.1	0.4-0.2-0.1
Unalloyed steel	110 150 310	C<0.25% C<0.80% C<1.40%	250-300-390 155-180-255 135-165-210	250-350-450 100-120-165 75-110-135	180-250-310 120-145-205 95-130-170	100-130-160 65-85-100 50-75-85
Low alloyed steel	125-225 220-450	Hardened	170-200-250 110-130-150	100-120-165 55-75-95	120-160-200 70-100-120	95-85-105 40-55-65
High alloyed steel	150-250 250-300	Hardened	170-200-250 110-130-150	90-115-150 60-75-90	110-140-180 65-90-120	60-80-90 40-50-60
High alloyed steel	150-250 250-350	Rapid steel (HSS) Hardened Hardened tool steel	130-160-195	75-105-130	90-125-155 70-95-120	50-60-75 30-40-50
Stainless steel	150-270	Ferritic, Martensitic	155-180-250	110-150-190	120-165-210	80-105-130
Steel castings	150 150-250 160-200	Unalloyed Low alloyed High alloyed	140-180-250 125-150-190 90-110-130	80-120-150 70-100-120 55-70-80	100-145-180 90-120-150 65-90-100	60-75-95 50-65-80 35-45-55
Stainless steel castings	150-250	Ferritic, martensitic		50-80	50-70-80	30-40-50

Material M	HB	Condition	Cutting speed m/min.			
			TIN25	TIN41	KM15	PM25
			0.4-0.2-0.1	0.3-0.2-0.1	0.2-0.1	0.4-0.2-0.1
Stainless steel annealed	150-220	Austenitic	180-220-280	80-150-220		150-240-300
Steel castings	200	Stainless, austenitic		40-70		50-60
Iron, nickel and cobalt base castings	180-300 220-300 220-300			40-100	20-40 20-40 10-20	
Titanium alloys	300-400					

Material K	HB	Condition	Cutting speed m/min.			
			TIN25	TIN41	KM15	PM25
			0.4-0.2-0.1	0.3-0.2-0.1	0.2-0.1	0.4-0.2-0.1
Tempered steel	HCR 50-65					15-20-30
Stainless steel castings	250	Manganese steel 12-14% Mn			12-18-20	
Malleable cast iron	110-145 200-230	Short chipping Long chipping		200-300 150-200	65-80-95 50-65-80	100-125-150 90-115-135
Grey cast iron	180 260	Low tensile strength High tensile strength		200-400 150-350	70-95-120 50-70-90	85-120-155 70-90-115
Nodular cast iron	160 250	Ferritic Pearlitic	100-130 90-110	100-250 100-180	50-65-80 45-60-70	70-90-115 65-80-100
Chilled cast iron	HCR 40-60					
Aluminium alloys	60-100 75-110	Non cast Cast			500-2100 400-2000	
Aluminium with high contents of Si		10-14% Si 14-16% Si 16-18% Si			200-1000 110-200	



C Clamp

This classic positive insert clamping system allows the use of all models presenting this geometry, both with additional chipbreaker and sintered.

This classic positive insert clamping system allows the use of all models presenting this geometry, both with additional chipbreaker and sintered.

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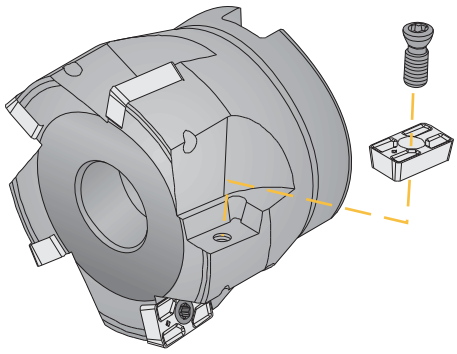

Screw clamping

Since the advent of the Torx screw it has been possible to hold with complete safety positive inserts with centre hole. Our range covers all the screw clamping permutations.

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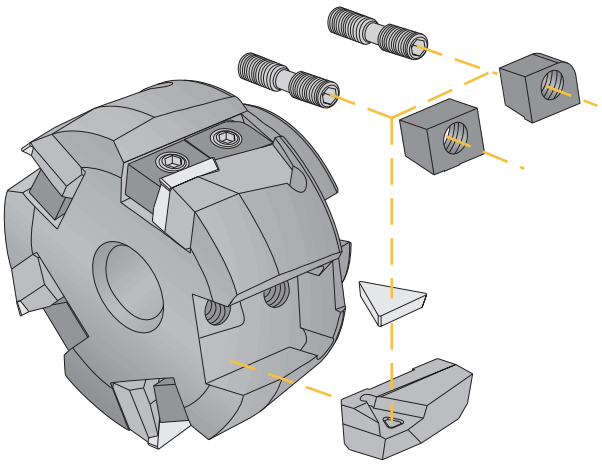

Wedge clamping

Heavy duty work require good fixation, for this purpose we have designed our wedge clamping system, one of the safest available.

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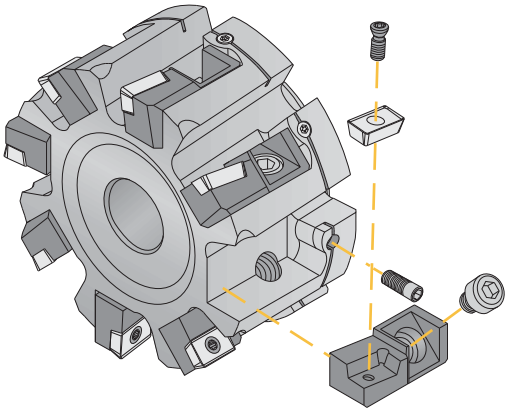


Cartridge system

Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

Cartridge system for heavy duty work with positive center hole inserts. The axial regulation screw allows a perfect adjustment for super-finishing applications.

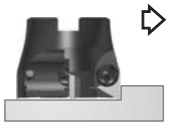
Face square shoulder cutters - Fraises à surfacer et à dresser - Eckfräser

101-102 90°
General application 90°

TP.. 1102..
TP.. 1103..
TP.. 1603..
Page K.18

111-112 90°
General application 90°

TP.. 1103..
TP.. 1603..
Page K.18

119-120-121 90°
General application 90°

TP.. 1103..
TP.. 1603..
TP.. 2204..
Page K.18

311-312 90°
General application 90°

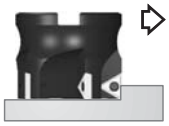
TP.. 1603..
TP.. 2204..
Page K.19

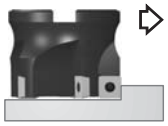
264 90°
General application 90°

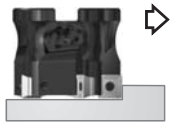
TC.. 16T3..
Page K.19

266 90°
General application 90°

TC.. 16T3..
Page K.19

261 90°
General application 90°

TC.. 16T3..
Page K.20

340 90°
Square and facing 90°

SPM.. 1204..
Page K.20

152 90°
Square and facing 90°

SDMT 12T3..
Page K.20

245 90°
Square and facing 90°

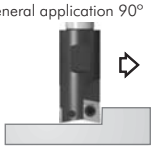
SDMT 12T3..
Page K.21

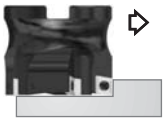
280-281 90°
General application 90°

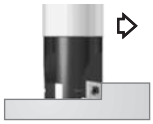
CC.. 0602..
CC.. 09T3..
Page K.21

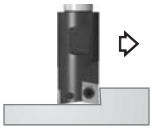
282-283 90°
General application 90°

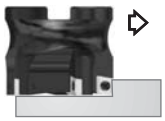
CC.. 0602..
CC.. 09T3..
Page K.21

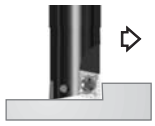
284-285-286 90°
General application 90°

CC.. 0602..
CC.. 0803..
CC.. 09T3..
Page K.22

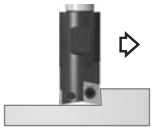
334 90°
General application 90°

CC.. 09T3..
Page K.22

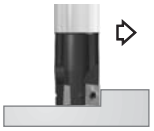
337 90°
General application 90°

CC.. 0602..
CC.. 09T3..
Page K.22

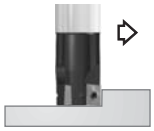
335 90°
General application 90°

CC.. 0602..
CC.. 09T3..
Page K.23

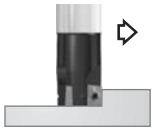
336 95°
General application 95°

CC.. 09T3..
Page K.23

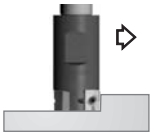
304-314 Multi-function centre-cutting end mill

CCKT 0602..
..
CCKT 1204..
Page K.23

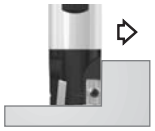
338 Multi-function centre-cutting end mill

CCKT 0602..
..
CCKT 1204..
Page K.24

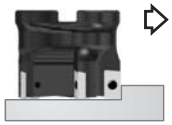
104 90°
First choice 90°

AP.. 1003..
Page K.24

109 90°
First choice 90°

AP.. 1003..
Page K.24

110 90°
First choice 90°

AP.. 1003..
Page K.25

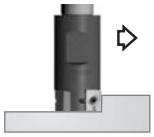
124 90°
First choice 90°

AP.. 1003..
Page K.25

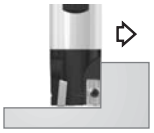
105 90°
First choice 90°

AP.. 1003..
Page K.25

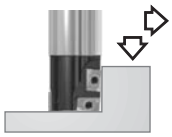
118 90°
First choice 90°

AP.. 1003..
Page K.26

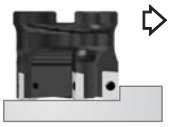
114 90°
First choice 90°

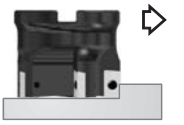
AP.. 1604..
Page K.26

113 90°
First choice 90°

AP.. 1604..
Page K.26

115 90°
First choice 90°

AP.. 1604..
Page K.27

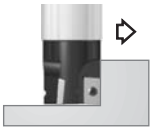
262-263 90°
Slot and side milling 90°

AP.. 1003..
AP.. 1604..
Page K.27

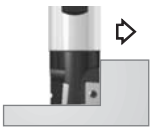
222 90°
First choice 90°

AP.. 1604..
Page K.27

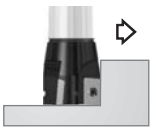
232 90°
First choice 90°

AP.. 1604..
Page K.28

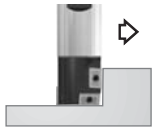
242 90°
First choice 90°

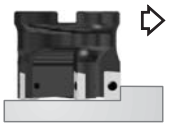
AP.. 1604..
Page K.28

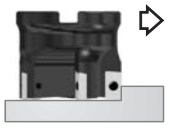
106 90°
Soft materials 90°

AD.. 1503..
Page K.28

201 90°
Soft materials 90°

AD.. 1503..
Page K.29

126 90°
Soft materials 90°

AD.. 1503..
Page K.29

205-225 90°
Milling and boring 90°

AD.. 1503..
Page K.29

231 90°
Soft materials 90°

AD.. 1503..
Page K.30

223 90°
Deep cutting 90°

AP.. 2004..
Page K.30

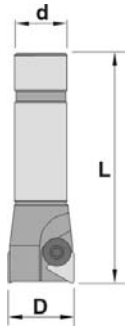
243 90°
Deep cutting 90°

AP.. 2004..
Page K.30

KIMU

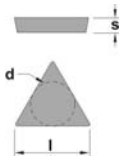
101-102 90°

REF.	D	d	L	Z	TP..		
101.016	16	16	100	1	1102..	205	503
101.020	20	20	100	2	1103..	205	503
101.025	25	20	110	2	1103..	205	503
101.032	32	25	110	3	1103..	205	503
101.040	40	25	110	4	1103..	205	503
102.020	20	20	100	1	1603..	206	504
102.032	32	25	110	2	1603..	206	504
102.040	40	25	-	3	1603..	206	504



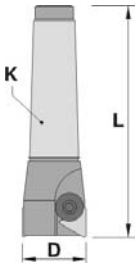
REF.	l	s	d
TP.. 1102..	11,00	2,38	6,35
TP.. 1103..	11,00	3,18	6,35
TP.. 1603..	16,50	3,18	9,52

For more information see page: A.54,55



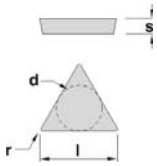
111-112 90°

REF.	D	K	L	Z	TP..		
111.020	20	MK3	125	2	1103..	205	503
111.025	25	MK3	125	2	1103..	205	503
111.032	32	MK3	125	3	1103..	205	503
111.040	40	MK3	125	4	1103..	205	503
112.032	32	MK3	125	2	1603..	206	504
112.040	40	MK3	125	3	1603..	206	504



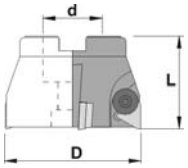
REF.	l	s	d
TP.. 1103..	11,00	3,18	6,35
TP.. 1603..	16,50	3,18	9,52

For more information see page: A.54,55



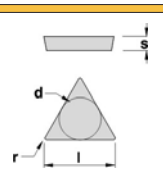
119-120-121 90°

REF.	D	d	L	Z	TP..					
119.040	40	16	40	4	1103..	205	503	-	-	108
119.050	50	22	40	4	1103..	205	503	-	-	910
120.040	40	16	40	3	1603..	206	504	-	-	108
120.050.Z=3	50	22	40	3	1603..	206	504	-	-	910
120.050	50	22	40	4	1603..	206	504	-	-	910
120.063	63	22	50	4	1603..	206	504	316	103	910
120.080	80	27	50	5	1603..	206	504	316	103	912
120.100	100	32	50	6	1603..	206	504	316	103	916
120.125	125	40	63	6	1603..	206	504	316	103	-
120.160	160	40	63	7	1603..	206	504	316	103	952
120.200	200	60	63	8	1603..	206	504	316	103	956
121.063	63	22	50	3	2204..	216	504	322	104	910
121.080	80	27	50	4	2204..	216	504	322	104	912
121.100	100	32	50	5	2204..	216	504	322	104	916
121.125	125	40	63	6	2204..	216	504	322	104	-
121.160	160	40	63	7	2204..	216	504	322	104	952
121.200	200	60	63	8	2204..	216	504	322	104	956



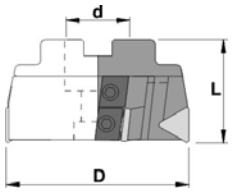
REF.	l	s	d
TP.. 1103..	11,00	3,18	6,35
TP.. 1603..	16,50	3,18	9,52
TP.. 2204..	22,00	4,76	12,70

For more information see page: A.54,55



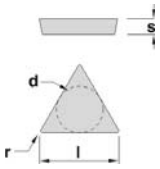
311-312 90°

REF.	D	d	L	Z	TP..						
311.050	50	16	50	5	1603..	631	633	181	535	652	108
311.063	63	22	50	6	1603..	631	633	181	535	652	910
311.080	80	27	50	5	1603..	602	603	177	522	616	912
311.100	100	32	50	7	1603..	602	603	177	522	616	916
311.125	125	40	63	7	1603..	602	603	177	522	616	-
311.160	160	40	63	9	1603..	602	603	177	522	616	952
311.200	200	60	63	11	1603..	602	603	177	522	616	956
311.250	250	60	63	15	1603..	602	603	177	522	616	956
312.080	80	27	50	5	2204..	634	635	177	522	622	912
312.100	100	32	50	7	2204..	634	635	177	522	622	916
312.125	125	40	63	7	2204..	634	635	177	522	622	-
312.160	160	40	63	9	2204..	634	635	177	522	622	952
312.200	200	60	63	11	2204..	634	635	177	522	622	956
312.250	250	60	63	15	2204..	634	635	177	522	622	956



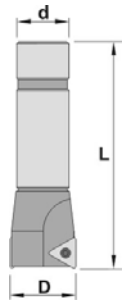
REF.	l	s	d
TP.. 1603..	16,50	3,18	9,52
TP.. 2204..	22,00	4,76	12,70

For more information see page: A.54,55



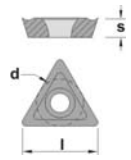
264 90°

REF.	D	d	L	Z	TC..		
264.016	16	20	110	1	16T3..	138	515
264.020	20	20	110	1	16T3..	138	515
264.025	25	25	110	2	16T3..	140	515
264.032	32	32	125	2	16T3..	140	515
264.040	40	32	125	3	16T3..	140	515



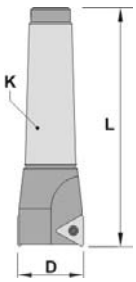
REF.	l	s	d
TC.. 16T3..	16,50	3,97	9,52

For more information see page: A.51,52



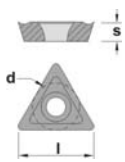
266 90°

REF.	D	K	L	Z	TC..		
266.025	25	MK3	125	2	16T3..	140	515
266.032	32	MK3	125	2	16T3..	140	515
266.040	40	MK3	125	3	16T3..	140	515



REF.	l	s	d
TC.. 16T3..	16,50	3,97	9,52

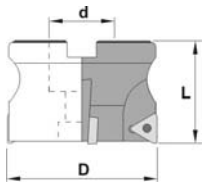
For more information see page: A.51,52



KIMU

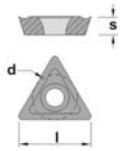
261 90°

REF.	D	d	L	Z	TC..			
261.040	40	16	40	3	16T3..	140	535	108
261.050	50	22	40	4	16T3..	140	535	910
261.063	63	27	50	5	16T3..	140	535	912
261.080	80	32	50	6	16T3..	140	535	916
261.100	100	40	50	7	16T3..	140	535	920
261.125	125	40	63	8	16T3..	140	535	-
261.160	160	40	63	10	16T3..	140	535	952



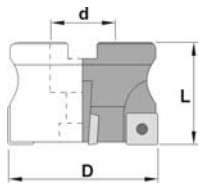
REF.	l	s	d
TC.. 16T3..	16,50	3,97	9,52

For more information see page: A.51,52



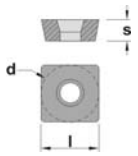
340 90°

REF.	D	d	L	Z	SPM..			
340.040	40	16	40	3	1204..	159	522	108
340.050	50	22	40	4	1204..	159	522	910
340.063	63	27	50	5	1204..	159	522	912
340.080	80	27	50	6	1204..	159	522	912
340.100	100	32	50	8	1204..	159	522	916
340.125	125	40	63	8	1204..	159	522	-
340.160	160	40	63	10	1204..	159	522	952
340.200	200	60	63	12	1204..	159	522	956
340.250	250	60	63	16	1204..	159	522	956

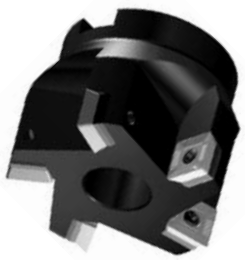


REF.	l	s	d
SPM.. 1204..	12,70	4,76	12,70

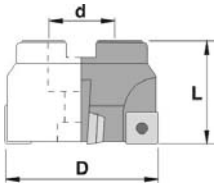
For more information see page: A.51



152 90°

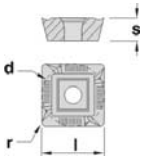


REF.	D	d	L	Z	SDMT					
152.040	40	16	40	3	12T3..	133	535	-	-	108
152.050	50	22	40	4	12T3..	133	535	350	194	910
152.063	63	27	50	5	12T3..	133	535	350	194	912
152.080	80	27	50	6	12T3..	133	535	350	194	912
152.100	100	32	50	7	12T3..	133	535	350	194	916
152.125	125	40	63	8	12T3..	133	535	350	194	-
152.160	160	40	63	10	12T3..	133	535	350	194	952
152.200	200	60	63	12	12T3..	133	535	350	194	956
152.250	250	60	63	16	12T3..	133	535	350	194	956



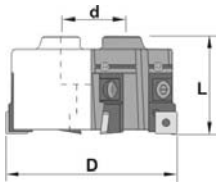
REF.	l	s	d
SDMT 12T3..	13,29	3,97	13,29

For more information see page: A.48



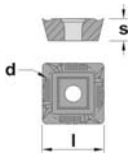
245 90°

REF.	D	d	L	Z	SDMT						
245.160	160	40	63	10	12T3..	133	350	194	187	460	952
245.200	200	60	63	12	12T3..	133	350	194	187	460	956
245.250	250	60	63	16	12T3..	133	350	194	187	460	956
245.315	315	60	63	20	12T3..	133	350	194	187	460	956
245.400	400	60	63	22	12T3..	133	350	194	187	460	956
245.500	500	60	63	28	12T3..	133	350	194	187	460	956



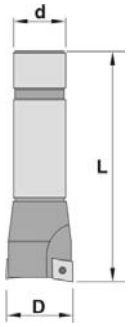
REF.	l	s	d
SDMT 12T3..	13,29	3,97	13,29

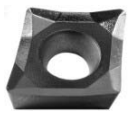
For more information see page: A.48



280-281 90°

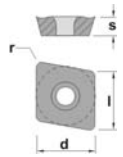
REF.	D	d	L	Z	CC..		
280.012	12	16	110	1	0602..	155	507
280.016	16	20	110	2	0602..	155	507
280.020	20	20	110	3	0602..	155	507
281.020	20	20	110	2	09T3..	138	515
281.025	25	25	110	2	09T3..	138	515
281.032	32	32	125	3	09T3..	140	515
281.040	40	32	125	4	09T3..	140	515





REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

For more information see page: A.38

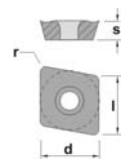


282-283 90°

REF.	D	d	L	Z	CC..		
282.016	16	20	175	2	0602..	155	507
282.020	20	20	200	3	0602..	155	507
283.020	20	20	200	2	09T3..	138	515
283.025	25	25	250	2	09T3..	138	515
283.032	32	32	250	3	09T3..	140	515

REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

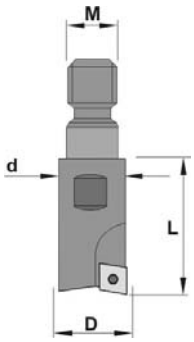
For more information see page: A.38

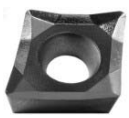


KIMU

284-285-286 90°

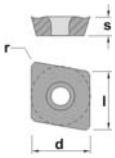
REF.	D	d	L	M	Z	CC..		
284.015	15	14	23	M8	2	0602..	155	507
284.016	16	14	23	M8	2	0602..	155	507
284.020	20	18	30	M10	3	0602..	155	507
285.020	20	18	30	M10	2	0803..	148	508
285.025	25	21	35	M12	2	0803..	148	508
286.032	32	29	43	M16	3	09T3..	138	515
286.045	45	29	43	M16	4	09T3..	140	515





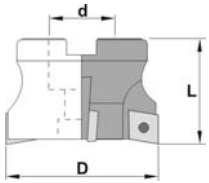
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 0803..	8,05	3,18	7,94
CC.. 09T3..	9,65	3,97	9,52

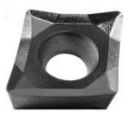
For more information see page: A.38



334 90°

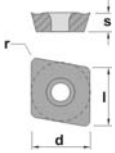
REF.	D	d	L	Z	CC..			
334.040	40	16	40	5	09T3..	138	535	108
334.050	50	22	40	5	09T3..	138	535	910
334.052	52	22	40	5	09T3..	138	535	910
334.063	63	27	50	6	09T3..	140	535	912
334.066	66	27	50	6	09T3..	140	535	912
334.080	80	27	50	7	09T3..	140	535	912





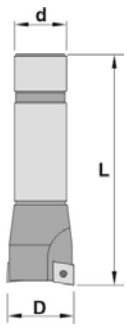
REF.	l	s	d
CC.. 09T3..	9,65	3,97	9,52

For more information see page: A.38



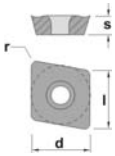
337 90°

REF.	D	d	L	Z	CC..		
337.016	16	20	150	2	0602..	155	507
337.020	20	20	175	3	0602..	155	507
337.025	25	25	175	2	09T3..	138	515
337.032	32	32	175	3	09T3..	140	515



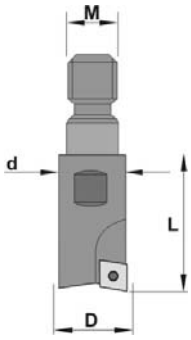
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

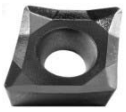
For more information see page: A.38



335 90°

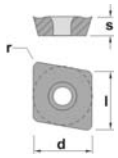
REF.	D	d	M	L	Z	CC..		
335.015	15	14	M8	23	2	0602..	155	507
335.016	16	14	M8	23	2	0602..	155	507
335.020	20	18	M10	30	3	0602..	155	507
335.025	25	21	M12	35	2	09T3..	138	515
335.032	32	29	M16	43	3	09T3..	138	515
335.045	45	29	M16	43	4	09T3..	140	515





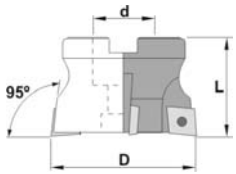
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 0803..	8,05	3,18	7,94
CC.. 09T3..	9,65	3,97	9,52

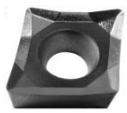
For more information see page: A.38



336 95°

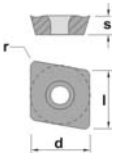
REF.	D	d	L	Z	CC..			
336.052	52	22	40	5	09T3..	138	535	910
336.066	66	27	50	6	09T3..	140	535	912
336.080	80	27	50	7	09T3..	140	535	912





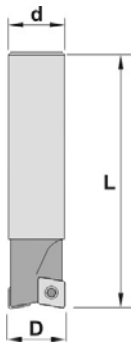
REF.	l	s	d
CC.. 09T3..	9,65	3,97	9,52

For more information see page: A.38



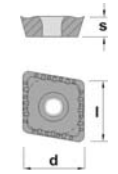
304-314

REF.	D	d	L	Z	CCKT				
304.012	12	16	100	1	060204	155	-	507	-
304.016	16	16	100	2	060204 / 080308	155	148	507	508
304.020	20	20	125	2	080308 / 09T308	148	138	508	515
304.025	25	25	125	2	09T308 / 120408	138	159	515	520
314.012	12	16	150	1	060204	155	-	507	-
314.016	16	16	175	2	060204 / 080308	155	148	507	508
314.020	20	20	175	2	080308 / 09T308	148	138	508	515
314.025	25	25	200	2	09T308 / 120408	138	159	515	520



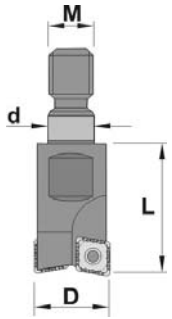
REF.	l	s	d
CCKT 0602..	6,45	2,38	6,35
CCKT 0803..	8,05	3,18	7,94
CCKT 09T3..	9,65	3,97	9,52
CCKT 1204..	12,90	4,76	12,70

For more information see page: A.38



338

REF.	D	d	L	M	Z	CCKT				
338.012	12	14	23	M8	1	060204	155	-	507	-
338.016	16	14	23	M8	2	060204 / 080308	155	148	507	508
338.020	20	18	30	M10	2	080308 / 09T308	148	138	508	515
338.025	25	21	35	M12	2	09T308 / 120408	138	144	515	-

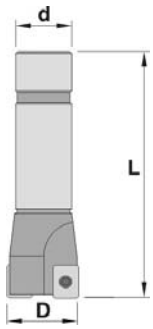


REF.	l	s	d
CCKT 0602..	6,45	2,38	6,35
CCKT 0803..	8,05	3,18	7,94
CCKT 09T3..	9,65	3,97	9,52
CCKT 1204..	12,90	4,76	12,70

For more information see page: A.38

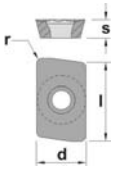
104 90°

REF.	D	d	L	Z	AP..		
104.012	12	16	110	1	1003..	155	507
104.016	16	20	110	2	1003..	155	507
104.020	20	20	125	3	1003..	125	507
104.025	25	25	125	4	1003..	125	507



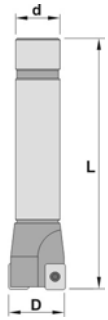
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

For more information see page: A.36,37



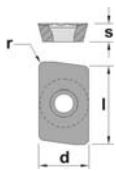
109 90°

REF.	D	d	L	Z	AP..		
109.016	16	20	175	2	1003..	155	507
109.020	20	20	200	3	1003..	125	507



REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

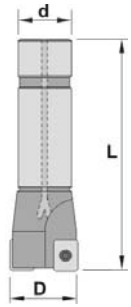
For more information see page: A.36,37



110 90°

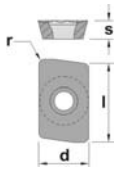
REF.	D	d	L	Z	AP..		
110.012	12	16	110	1	1003..	155	507
110.016	16	20	110	2	1003..	155	507
110.020	20	20	125	3	1003..	125	507
110.025	25	25	125	4	1003..	125	507

Internal coolant system



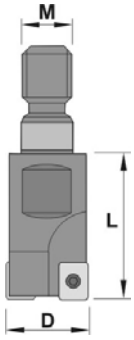
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

For more information see page: A.36,37



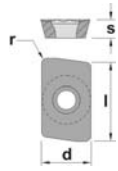
124 90°

REF.	D	M	L	Z	AP..		
124.016	16	M8	23	2	1003..	155	507
124.020	20	M10	30	3	1003..	125	507
124.025	25	M12	35	3	1003..	155	507



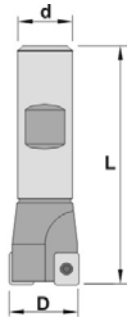
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

For more information see page: A.36,37



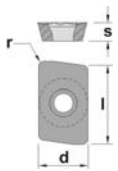
105 90°

REF.	D	d	L	Z	AP..		
105.012	12	16	90	1	1003..	155	507
105.016	16	20	90	2	1003..	155	507
105.020	20	20	95	3	1003..	125	507
105.025	25	25	95	4	1003..	125	507



REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

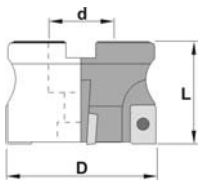
For more information see page: A.36,37



KIMU

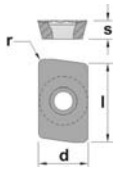
118 90°

REF.	D	d	L	Z	AP..			
118.032	32	16	40	5	1003..	125	517	108
118.040	40	16	40	6	1003..	125	517	108
118.050	50	22	40	7	1003..	125	517	910
118.063	63	22	50	9	1003..	125	517	910



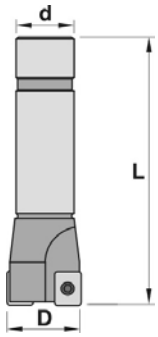
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

For more information see page: A.36,37



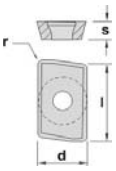
114 90°

REF.	D	d	L	Z	AP..		
114.020	20	20	200	1	1604..	138	515
114.025	25	25	200	2	1604..	138	515
114.032	32	32	250	3	1604..	140	515
114.040	40	32	250	4	1604..	140	515



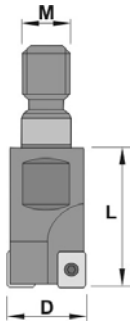
REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

For more information see page: A.36,37



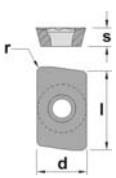
113 90°

REF.	D	M	L	Z	AP..		
113.025	25	M12	35	2	1604..	138	515
113.032	32	M16	43	3	1604..	140	515



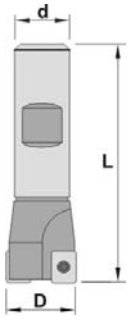
REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

For more information see page: A.36,37



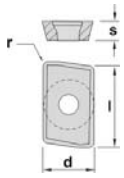
115 90°

REF.	D	d	L	Z	AP..		
115.020	20	20	100	1	1604..	138	515
115.025	25	25	100	2	1604..	138	515
115.032	32	32	110	3	1604..	140	515
115.040	40	32	110	4	1604..	140	515



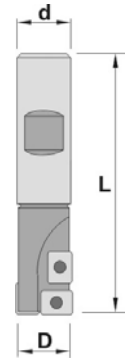
REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

For more information see page: A.36,37



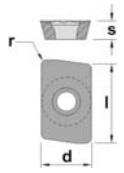
262-263 90°

REF.	D	d	L	Z	AP..		
262.020	20	20	90	1+1	1003..	155	507
262.025	25	25	110	1+1	1003..	155	507
263.032	32	32	125	1+1	1604..	138	515
263.040	40	32	125	1+1	1604..	138	515

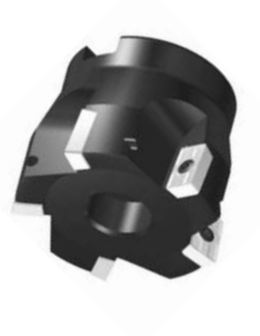


REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35
AP.. 1604..	16,00	4,76	9,52

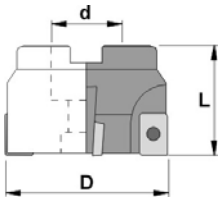
For more information see page: A.36,37



222 90°

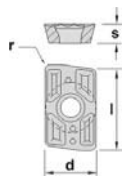


REF.	D	d	L	Z	AP..			
222.040	40	16	40	4	1604..	140	535	108
222.050	50	22	40	5	1604..	140	535	910
222.063	63	27	50	6	1604..	140	535	912
222.080	80	27	50	7	1604..	140	535	912
222.100	100	32	50	8	1604..	140	535	916
222.125	125	40	63	8	1604..	140	535	-
222.160	160	40	63	9	1604..	140	535	952



REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

For more information see page: A.36,37

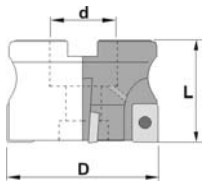


KIMU

232 90°

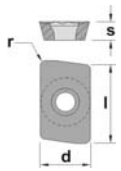
REF.	D	d	L	Z	AP..			
232.040	40	16	40	4	1604..	140	535	108
232.050	50	22	40	5	1604..	140	535	910
232.063	63	27	50	6	1604..	140	535	912
232.080	80	27	50	7	1604..	140	535	912
232.100	100	32	50	8	1604..	140	535	916

Internal coolant system



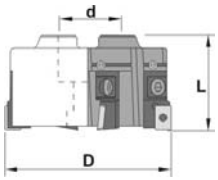
REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

For more information see page: A.36,37



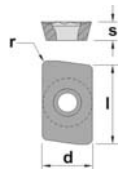
242 90°

REF.	D	d	L	Z	AP..						
242.160	160	40	63	10	1604..	140	535	630	187	460	952
242.200	200	60	63	12	1604..	140	535	630	187	460	956
242.250	250	60	63	16	1604..	140	535	630	187	460	956
242.315	315	60	63	20	1604..	140	535	630	187	460	956
242.400	400	60	63	22	1604..	140	535	630	187	460	956
242.500	500	60	63	28	1604..	140	535	630	187	460	956



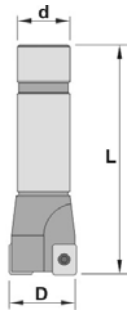
REF.	l	s	d
AP.. 1604..	17,00	4,76	9,52

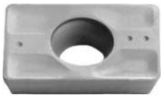
For more information see page: A.36,37



106 90°

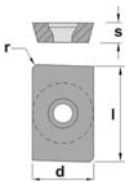
REF.	D	d	L	Z	ADM..		
106.016	16	20	110	1	1503..	138	515
106.020	20	20	110	1	1503..	138	515
106.025	25	25	110	2	1503..	138	515
106.032	32	32	125	3	1503..	138	515
106.040	40	32	125	4	1503..	138	515
106.050	50	32	125	4	1503..	140	515





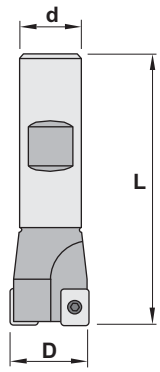
REF.	l	s	d
ADM.. 1503..	15,00	3,18	9,52

For more information see page: A.36



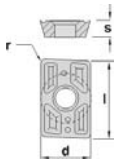
201 90°

REF.	D	d	L	Z	ADM..		
201.016	16	20	100	1	1503..	138	515
201.020	20	20	100	1	1503..	138	515
201.025	25	25	100	2	1503..	138	515
201.032	32	32	100	3	1503..	138	515
201.040	40	32	100	4	1503..	138	515
201.050	50	32	100	4	1503..	140	515



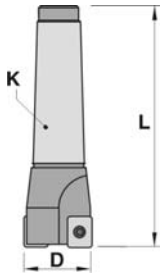
REF.	l	s	d
ADM.. 1503..	15,00	3,18	9,52

For more information see page: A.36



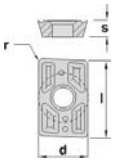
126 90°

REF.	D	K	L	Z	ADM..		
126.020	20	MK3	125	1	1503..	138	515
126.025	25	MK3	125	2	1503..	138	515
126.032	32	MK3	125	3	1503..	138	515
126.040	40	MK3	125	4	1503..	138	515
126.050	50	MK3	125	4	1503..	140	515



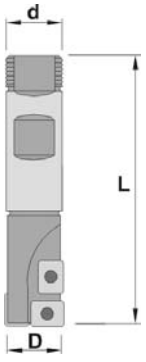
REF.	l	s	d
ADM.. 1503..	15,00	3,18	9,52

For more information see page: A.36



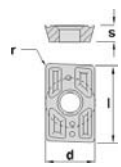
205-225 90°

REF.	D	d	L	Z	ADM..		
205.029	29	25	100	1+1	1503..	138	515
205.032	32	32	100	1+1	1503..	138	515
205.040	40	32	100	1+1	1503..	138	515
225.029	29	25	150	1+1	1503..	138	515
225.032	32	32	175	1+1	1503..	138	515
225.040	40	32	175	1+1	1503..	138	515



REF.	l	s	d
ADM.. 1503..	15,00	3,18	9,52

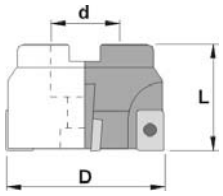
For more information see page: A.36



KIMU

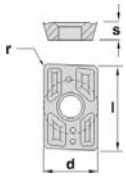
231 90°

REF.	D	d	L	Z	ADM..			
231.040	40	16	40	4	1503..	140	535	108
231.050	50	22	40	5	1503..	140	535	910
231.063	63	27	50	6	1503..	140	535	912
231.080	80	32	50	6	1503..	140	535	916
231.100	100	40	50	8	1503..	140	535	920

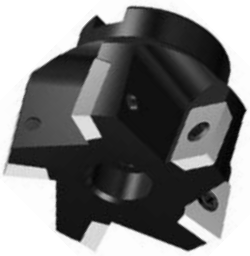


REF.	l	s	d
ADM.. 1503..	15,00	3,18	9,52

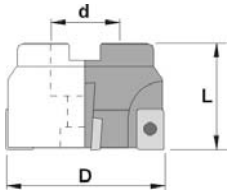
For more information see page: A.36



223 90°

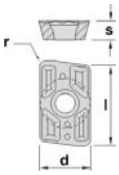


REF.	D	d	L	Z	AP..			
223.040	40	16	40	3	2004..	159	522	108
223.050	50	22	40	4	2004..	159	522	910
223.063	63	22	50	5	2004..	159	522	910
223.080	80	27	50	6	2004..	159	522	912
223.100	100	32	50	6	2004..	159	522	916
223.125	125	40	63	8	2004..	159	522	-



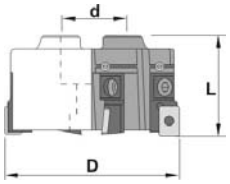
REF.	l	s	d
AP.. 2004..	20,00	4,76	12,70

For more information see page: A.36



243 90°

REF.	D	d	L	Z	AP..						
243.160	160	40	63	10	2004..	159	522	620	187	460	952
243.200	200	60	63	12	2004..	159	522	620	187	460	956
243.250	250	60	63	16	2004..	159	522	620	187	460	956
243.315	315	60	63	20	2004..	159	522	620	187	460	956
243.400	400	60	63	22	2004..	159	522	620	187	460	956
243.500	500	60	63	28	2004..	159	522	620	187	460	956



REF.	l	s	d
AP.. 2004..	20,00	4,76	12,70

For more information see page: A.37,38

Cutting data for facing square shoulder cutters

Material P	HB	Condition	Cutting speed m/min.			
			TIN25	TIN41	PM25	PM40
			0.3-0.2-0.1	0.3-0.2-0.1	0.4-0.2-0.1	0.4-0.2-0.1
Unalloyed steel	110 150 310	C<0.25% C<0.80% C<1.40%	250-300-390 155-180-255 135-165-210	250-350-450 100-120-165 75-110-135	180-250-310 120-145-205 95-130-170	100-130-160 65-85-100 50-75-85
Low alloyed steel	125-225 220-450	Hardened	170-200-250 110-130-150	100-120-165 55-75-95	120-160-200 70-100-120	95-85-105 40-55-65
High alloyed steel	150-250 250-300	Hardened	140-170-225 90-110-150	90-115-150 60-75-90	110-140-180 65-90-120	60-80-90 40-50-60
High alloyed steel	150-250 250-350	Rapid steel (HSS) Hardened Hardened tool steel	130-160-195	75-105-130	90-125-155 70-95-120	50-60-75 30-40-50
Stainless steel	150-270	Ferritic, Martensitic	155-180-250	110-150-190	120-165-210	80-105-130
Steel castings	150 150-250 160-200	Unalloyed Low alloyed High alloyed	140-180-250 125-150-190 90-110-130	80-120-150 70-100-120 55-70-80	100-145-180 90-120-150 65-90-100	60-75-95 50-65-80 35-45-55
Stainless steel castings	150-250	Ferritic, martensitic		50-80	50-70-80	30-40-50

Material M	HB	Condition	Cutting speed m/min.			
			TIN25	TIN41	KM15	PM25
			0.4-0.2-0.1	0.3-0.2-0.1	0.2-0.1	0.4-0.2-0.1
Stainless steel annealed	150-220	Austenitic	180-220-280	80-150-220		150-240-300
Steel castings	200	Stainless, austenitic		40-70		50-60
Iron, nickel and cobalt base castings	180-300 220-300 220-300			40-100	20-40 20-40 10-20	
Titanium alloys	300-400					

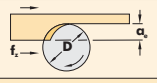
Material K	HB	Condition	Cutting speed m/min.			
			TIN41	TIN25	KM15	PM25
			0.3-0.2-0.1	0.4-0.2-0.1	0.2-0.1	0.4-0.2-0.1
Tempered steel	HCR 50-65					
Stainless steel castings	250	Manganese steel 12-14% Mn			12-18-20	15-20-30
Malleable cast iron	110-145 200-230	Short chipping Long chipping	200-300 150-200		65-80-95 50-65-80	100-125-150 90-115-135
Grey cast iron	180 260	Low tensile strength High tensile strength	200-400 150-350		70-95-120 50-70-90	85-120-155 70-90-115
Nodular cast iron	160 250	Ferritic Pearlitic	100-250 100-180	100-130 90-110	50-65-80 45-60-70	70-90-115 65-80-100
Chilled cast iron	HCR 40-60					
Aluminium alloys	60-100 75-110	Non cast Cast			500-2100 400-2000	
Aluminium with high contents of Si		10-14% Si 14-16% Si 16-18% Si			200-1000 110-200	

Cutting data for Drill-Mill cutters

Material P	HB	Condition	Tool diameter (D mm.)	Basic qualities TIN25	PM25	PM40	KM15 (Cutting speed m/min.)	Feed/tooth complete slot f_2
Unalloyed steel	110 170 250	C<0,25% C<0,8% C<1,4%	12-16 20 25 32 40	180-230 120-150 80-130	150-200 100-140 70-110	100-150 80-120 60-100		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Low alloyed steel	125-225 220-450	Annealed Hardened	12-16 20 25 32 40	100-150 60-110	90-140 60-110	70-110 45-80		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
High alloyed steel	150-250 250-500	Annealed Hardened	12-16 20 25 32 40	80-120	80-120 50-80	60-100 40-70		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Stainless steel	150-270	Ferritic/Martensitic	12-16 20 25 32 40	120-160	100-130	60-100		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Steel castings	150 150-220 160-200	Unalloyed Low alloyed High alloyed	12-16 20 25 32 40		80-110 50-90 50-80	70-100 40-80 40-70		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Stainless steel castings	200	Ferritic/Martensitic	12-16 20 25 32 40	50-80	40-70	35-60		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24

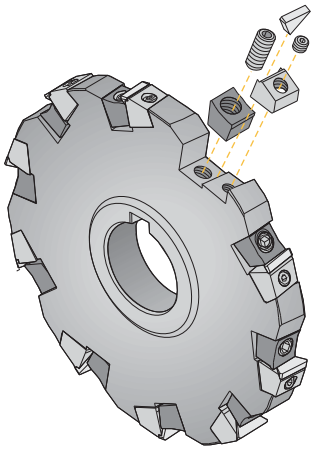
Material M	HB	Condition	Tool diameter (D mm.)	Basic qualities TIN25	PM25	PM40	KM15 (Cutting speed m/min.)	Feed/tooth complete slot f_2
Stainless steel	150-220	Austenitic	12-16 20 25 32 40	80-160	70-130	55-90		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Stainless steel castings	200	Austenitic	12-16 20 25 32 40	40-70	40-60	35-55		0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24

Material K	HB	Condition	Tool diameter (D mm.)	Basic qualities TIN25	PM25	PM40	KM15 (Cutting speed m/min.)	Feed/tooth complete slot f_2
Malleable cast iron	110-145 200-230	Short chipping Long chipping	12-16 20 25 32 40				90-120 80-100	0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Grey cast iron	180 260	Low tensile strength High tensile strength	12-16 20 25 32 40				60-120 50-100	0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Nodular cast iron Spheroidal graphite	160 250	Ferritic Pearlitic	12-16 20 25 32 40				50-80 40-70	0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Aluminium	60-150 40-180	Forged Cast	12-16 20 25 32 40				300-500 250-450	0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24
Bronze-brass alloys	60-150		12-16 20 25 32 40				80-120	0,02-0,11 0,11-0,14 0,12-0,18 0,15-0,21 0,18-0,24



D/a_e	50	40	20	10	5	2,5	2	1,5	1
f_1	4,5	4	3	2	1,5	1	1	1	1

When you trace a contour (side peripherical milling), you must multiply the f_2 value of a complete slot (see table) by the correction factor f_1 corresponding to the relationship D/a_e (milling cutter diameter/radial cutting depth) in order to get a suitable feed.



Wedge clamping

This classic positive insert clamping system allows the use of all models presenting this geometry, both with additional chipbreaker and sintered.

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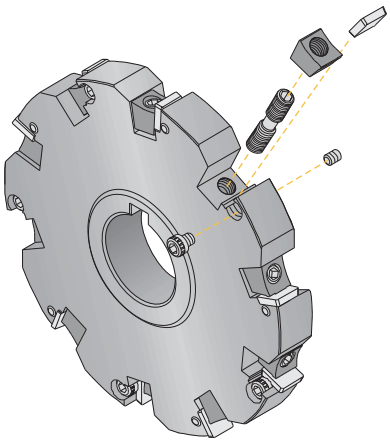

Wedge clamping

This classic positive insert clamping system allows the use of all models presenting this geometry, both with additional chipbreaker and sintered.

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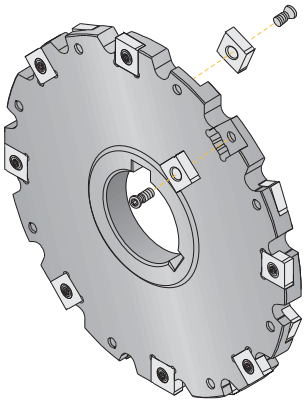

Screw clamping

Since the advent of the Torx screw it has been possible to hold with complete safety positive inserts with centre hole. Our range covers all the screw fixing permutations.

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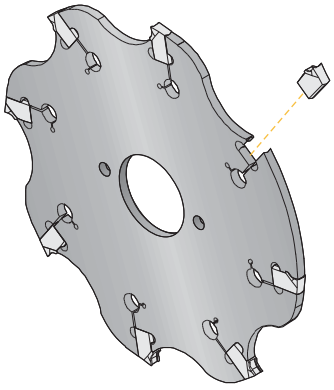

Spring action

The inserts are retained by a clamping/spring action into a fixed insert seat.

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The inserts are retained by a clamping/spring action into a fixed insert seat.

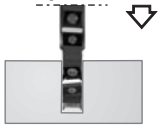
Slot cutters - Fraises disque - Scheibenfräser

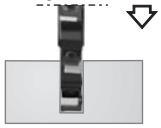
218
"T" Slots 90°

CC.. 0602..
...
CC.. 1204..
Page K.36

219
"T" Slots 90°

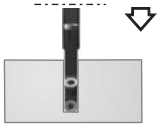
CC.. 0602..
...
CC.. 1204..
Page K.36

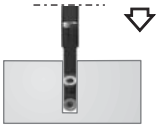
380-384
Slots milling 90°

TP.. 1603..
TP.. 2204..
Page K.36

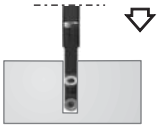
361...368
Slot milling 90°

SP.. 0903..
SP.. 1203..
SP.. 1504..
Page K.37

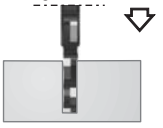
390
Side milling 89°

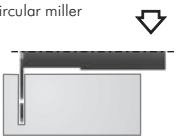
SP.. 1203..
Page K.37

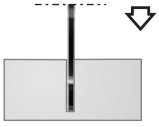
150
Slot milling

RP.. 0802MO
Page K.38

153
Slot milling

RP.. 1003MO
Page K.38

159
Slot milling

RP.. 1204MO
Page K.38

351
Slot milling 89°

SNHX.. 1102..
...
SNHX.. 1207..
Page K.39

421
Circular miller

FRC.. 2,2
...
FRC.. 4,0
Page K.39

451
Blade body

FRC.. 1,6
...
FRC.. 6,0
Page K.40

0 8	3	0	95	100	R / 16
1	2	3	4	5	6

1

08	09	13	15	19	29
90°	92°				

2

1	2	3	4
80° 6	80° 8 · 8	16 · 9 · 80° 9 · 10	22 · 12 · 80° 12 · 12

3

0	2	4	9
11°	0°	7°	ØM 11°

4

07 Short Weldon	Short Morse DIN 228	90 Direct spindle mounting	95 Direct spindle mounting	96 Cutting hand
Ø12 Ø16 Ø20 Ø25 Ø32 Ø40	M2-M3 **30** · M4 **34** · M5 **35**			L · R

5

Diameter, mm. D

6 *

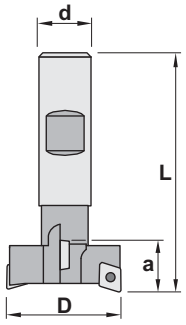
Cutting hand R · L

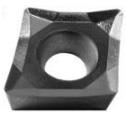
6 **

Cutting width

218

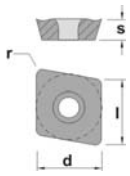
REF.	D	d	L	a	Z	CC..		
218.025	25	25	85	11	2+2	0602..	125	507
218.032	32	25	95	14	2+2	0803..	130	508
218.040	40	25	105	18	2+2	09T3..	140	515
218.050	50	32	120	22	2+2	1204..	150	520





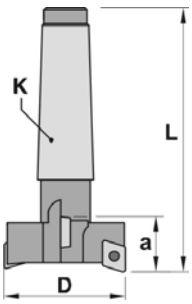
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 0803..	8,05	3,18	7,94
CC.. 09T3..	9,65	3,97	9,52
CC.. 1204..	12,90	4,76	12,70

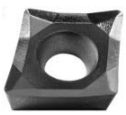
For more information see page: A.38



219

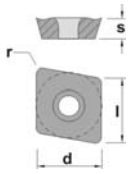
REF.	D	K	L	a	Z	CC..		
219.025	25	MK3	125	11	2+2	0602..	125	507
219.032	32	MK3	125	14	2+2	0803..	130	508
219.040	40	MK3	134	18	2+2	09T3..	140	515
219.050	50	MK4	165	22	2+2	1204..	150	520





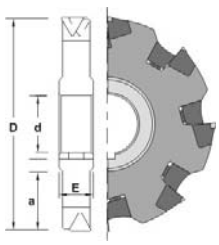
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 0803..	8,05	3,18	7,94
CC.. 09T3..	9,65	3,97	9,52
CC.. 1204..	12,90	4,76	12,70

For more information see page: A.38



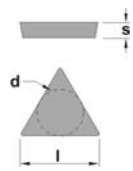
380-384

REF.	D	d	E	a	Z	TP..							
380.100	100	27	18	28	6	1603..	128	204	600	610	662	663	504	503
380.125	125	32	18	39	8	1603..	128	204	600	610	662	663	504	503
830.126	125	32	20	39	8	1603..	128	204	600	610	662	663	504	503
380.127	125	32	22	39	8	1603..	128	204	600	610	662	663	504	503
380.128	125	32	24	39	8	1603..	128	204	600	610	662	663	504	503
380.160	160	40	18	49	10	1603..	128	204	600	610	662	663	504	503
380.161	160	40	20	49	10	1603..	128	204	600	610	662	663	504	503
380.162	160	40	22	49	10	1603..	128	204	600	610	662	663	504	503
380.163	160	40	24	49	10	1603..	128	204	600	610	662	663	504	503
380.200	200	50	18	60	12	1603..	128	204	600	610	662	663	504	503
380.201	200	50	20	60	12	1603..	128	204	600	610	662	663	504	503
380.202	200	50	22	60	12	1603..	128	204	600	610	662	663	504	503
380.250	250	50	22	86	16	1603..	128	204	600	610	662	663	504	503
380.315	315	50	26	114	20	1603..	128	204	600	610	662	663	504	503
384.315	315	50	34	114	16	2204..	128	486	601	611	664	665	504	505
384.400	400	50	34	150	20	2204..	128	486	601	611	664	665	504	505



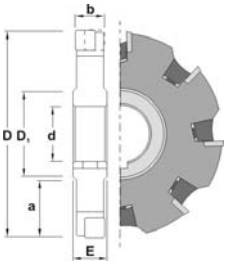
REF.	l	s	d
TP.. 1603..	16,50	3,18	9,52
TP.. 2204..	22,00	4,76	12,70

For more information see page: A.54,55



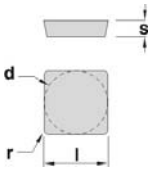
361...368 90°

REF.	D	b	d	D1	E	a	Z	SP..								
361.050	50	10	16	28	12	10	6	0903..	111	114	154	636	637	535	509	502
361.063	63	10	22	35	12	12	6	0903..	111	114	154	636	637	535	509	502
361.080	80	10	22	35	12	20	8	0903..	112	114	154	613	614	535	509	502
361.100	100	10	27	41	12	28	10	0903..	112	114	154	613	614	535	509	502
362.100	100	12	27	41	14	28	10	0903..	112	124	154	613	614	535	509	502
363.100	100	14	27	41	16	28	10	0903..	112	124	154	613	614	535	509	502
361.125	125	10	32	48	12	39	12	0903..	110	114	154	613	614	535	509	502
362.125	125	12	32	48	14	39	12	0903..	110	124	154	613	614	535	509	502
363.125	125	14	32	48	16	39	12	0903..	110	124	154	613	614	535	509	502
361.160	160	10	40	58	12	49	14	0903..	110	114	154	613	614	535	509	502
362.160	160	12	40	58	14	49	14	0903..	110	124	154	613	614	535	509	502
363.160	160	14	40	58	16	49	14	0903..	110	124	154	613	614	535	509	502
364.080	80	16	22	35	18	20	6	1203..	127	126	157	600	610	-	504	525
364.100	100	16	27	41	18	28	8	1203..	128	126	157	600	610	-	504	525
364.125	125	16	32	48	18	39	10	1203..	128	126	157	600	610	-	504	525
365.125	125	18	32	48	20	39	10	1203..	128	105	157	600	610	-	504	525
366.125	125	20	32	48	22	39	10	1203..	128	105	157	600	610	-	504	525
364.160	160	16	40	58	18	49	12	1203..	128	126	157	600	610	-	504	525
365.160	160	18	40	58	20	49	12	1203..	128	105	157	600	610	-	504	525
366.160	160	20	40	58	22	49	12	1203..	128	105	157	600	610	-	504	525
364.200	200	16	50	72	18	60	16	1203..	128	126	157	600	610	-	504	525
365.200	200	18	50	72	20	60	16	1203..	128	105	157	600	610	-	504	525
366.200	200	20	50	72	22	60	16	1203..	128	105	157	600	610	-	504	525
366.250	250	20	50	72	22	86	20	1203..	128	105	157	600	610	-	504	525
367.250	250	24	50	72	26	86	20	1203..	128	105	157	600	610	-	504	525
367.315	315	24	50	72	26	114	24	1203..	128	105	157	600	610	-	504	525
368.315	315	30	50	72	32	114	20	1504..	128	115	156	601	611	-	504	505
368.400	400	30	50	72	32	150	24	1504..	128	115	156	601	611	-	504	505



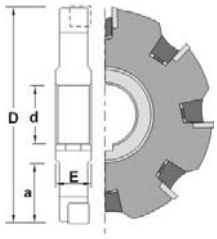
REF.	l	s	d
SP.. 0903..	9,52	3,18	9,52
SP.. 1203..	12,70	3,18	12,70
SP.. 1504..	15,88	4,76	15,88

For more information see page: A.50,51



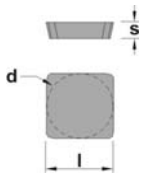
390

REF.	D	d	E	a	Z	SP..							
390.100.L	100	27	18	28	7	1203..	128	126	157	-	610	504	525
390.100.R	100	27	18	28	7	1203..	128	126	157	600	-	504	525
390.125.L	125	32	22	39	8	1203..	128	126	157	-	610	504	525
390.125.R	125	32	22	39	8	1203..	128	126	157	600	-	504	525
390.160.L	160	40	22	49	10	1203..	128	126	157	-	610	504	525
390.160.R	160	40	22	49	10	1203..	128	126	157	600	-	504	525
390.200.L	200	50	22	60	12	1203..	128	126	157	-	610	504	525
390.200.R	200	50	22	60	12	1203..	128	126	157	600	-	504	525
390.250.L	250	50	22	86	16	1203..	128	126	157	-	610	504	525
390.250.R	250	50	22	86	16	1203..	128	126	157	600	-	504	525
390.315.L	315	50	26	114	20	1203..	128	126	157	-	610	504	525
390.315.R	315	50	26	114	20	1203..	128	126	157	600	-	504	525



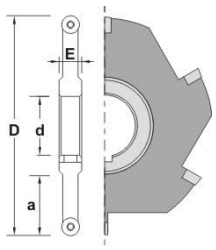
REF.	l	s	d
SP.. 1203..	12,70	3,18	12,70

For more information see page: A.50,51



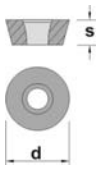
150

REF.	D	d	E	a	Z	RPMW		
150.050	50	16	10	10	5	0802MO	130	518
150.063	63	22	10	12	6	0802MO	130	518
150.080	80	22	10	20	7	0802MO	130	518
150.100	100	27	10	28	8	0802MO	130	518
150.125	125	32	10	39	9	0802MO	130	518
150.160	160	40	10	49	10	0802MO	130	518
150.200	200	50	10	60	12	0802MO	130	518



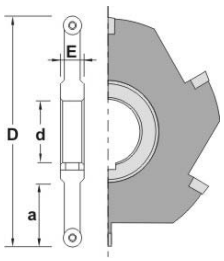
REF.	l	s	d
RPMW 0802MO	-	2,38	8,00

For more information see page: A.47



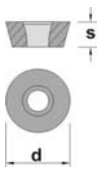
153

REF.	D	d	E	a	Z	RPMW		
153.050	50	16	12	10	5	1003MO	138	535
153.063	63	22	12	12	5	1003MO	140	535
153.080	80	22	12	20	6	1003MO	140	535
153.100	100	27	12	28	7	1003MO	140	535
153.125	125	32	12	39	8	1003MO	140	535
153.160	160	40	12	49	9	1003MO	140	535
153.200	200	50	12	60	10	1003MO	140	535
153.250	250	50	12	86	12	1003MO	140	535



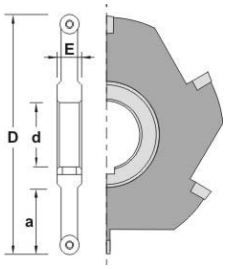
REF.	l	s	d
RPMW 1003MO	-	3,18	10,00

For more information see page: A.47



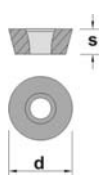
159

REF.	D	d	E	a	Z	RPMW		
159.080	80	22	14	20	6	1204MO	140	535
159.100	100	27	14	28	7	1204MO	140	535
159.125	125	32	14	39	8	1204MO	140	535
159.160	160	40	14	49	9	1204MO	140	535
159.200	200	50	14	60	10	1204MO	140	535
159.250	250	50	14	86	12	1204MO	140	535



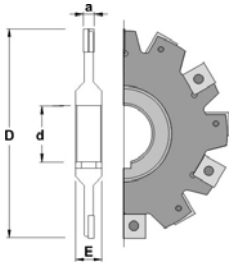
REF.	l	s	d
RPMW 1204MO	-	4,76	12,00

For more information see page: A.47



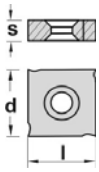
351 90°

REF.	D	d	a	E	Z	SNHX		
351.100	100	27	4	12	12	1102..	135	517
351.101	100	27	5	12	12	1103..	136	517
351.102	100	27	6	12	10	1203..	145	535
351.103	100	27	8	12	10	1245..	147	535
351.104	100	27	10	12	10	1205..	146	535
351.105	100	27	12	16	10	1207..	143	535
351.125	125	32	4	12	14	1102..	135	517
351.126	125	32	5	12	14	1103..	136	517
351.127	125	32	6	12	12	1203..	145	535
351.128	125	32	8	12	12	1245..	147	535
351.129	125	32	10	12	12	1205..	146	535
351.130	125	32	12	16	12	1207..	143	535
351.161	160	40	5	12	18	1103..	135	517
351.162	160	40	6	12	16	1203..	145	535
351.163	160	40	8	12	16	1245..	147	535
351.164	160	40	10	12	16	1205..	146	535
351.165	160	40	12	16	16	1207..	143	535
351.202	200	50	6	12	18	1203..	145	535
351.203	200	50	8	12	18	1245..	147	535
351.204	200	50	10	12	18	1205..	146	535
351.205	200	50	12	16	18	1207..	143	535
351.250	250	50	6	12	24	1203..	145	535
351.251	250	50	8	12	24	1245..	147	535
351.252	250	50	10	12	24	1205..	146	535
351.253	250	50	12	16	24	1207..	143	535



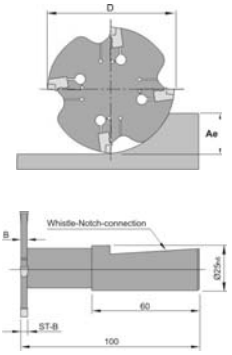
REF.	l	s	d
SNHX 1102XX	11,00	2,38	11,00
SNHX 1103XX	11,00	2,70	11,00
SNHX 1203XX	12,70	3,18	12,70
SNHX 12045XX	12,70	4,50	12,70
SNHX 1205XX	12,70	5,40	12,70
SNHX 1207XX	12,70	7,00	12,70

For more information see page: A.49



421

REF.	D	B	ST-B	Ae	Rev max	Z	FRC..	
421.063	63	1,8	2,2	20	1250	4	2,2	533
421.064	63	2,4	3,0	20	1250	4	3,0	533
421.065	63	3,0	4,0	20	1250	4	4,0	533
421.080	80	1,8	2,2	26	1000	5	2,2	533
421.081	80	2,4	3,0	26	1000	5	3,0	533
421.082	80	3,0	4,0	26	1000	5	4,0	533
421.100	100	1,8	2,2	36	800	8	2,2	533
421.101	100	2,4	3,0	36	800	8	3,0	533
421.102	100	3,0	4,0	36	800	8	4,0	533

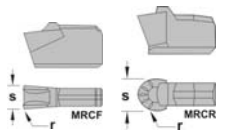


FRC

FRCR

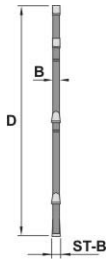
REF.	s	r
FRC 2,2	2,2	0,20
FRC 3,0	3,0	0,20
FRC 4,0	4,0	0,20
FRCR 3,0	3,0	1,50
FRCR 4,0	4,0	2,00

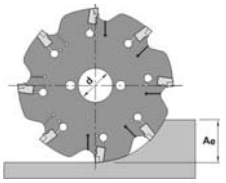
For more information see page: A.44



451

REF.	D	B	ST-B	Ae	Rev max. min-1	Z	FRC..	
451.080	80	1,2	1,6	22	1000	4	1,6	533
451.081	80	1,8	2,2	22	1000	4	2,2	533
451.082	80	2,4	3,0	22	1000	4	3,0	533
451.083	80	3,0	4,0	22	1000	4	4,0	533
451.084	80	4,4	5,0+6,0	22	1000	4	5,0-6,0	533
451.100	100	1,2	1,6	28	800	8	1,6	533
451.101	100	1,8	2,2	28	800	8	2,2	533
451.102	100	2,4	3,0	28	800	8	3,0	533
451.103	100	3,0	4,0	28	800	8	4,0	533
451.104	100	4,4	5,0+6,0	28	800	8	5,0-6,0	533
451.125	125	1,2	1,6	40	650	10	1,6	533
451.126	125	1,8	2,2	40	650	10	2,2	533
451.127	125	2,4	3,0	40	650	10	3,0	533
451.128	125	3,0	4,0	40	650	10	4,0	533
451.129	125	4,4	5,0+6,0	40	650	10	5,0-6,0	533
451.160	160	2,4	3,0	49	500	15	3,0	533
451.161	160	3,0	4,0	49	500	15	4,0	533
451.162	160	4,4	5,0+6,0	49	500	15	5,0-6,0	533
451.163	200	2,4	3,0	63	400	20	3,0	533
451.164	200	3,0	4,0	63	400	20	4,0	533
451.165	200	4,4	5,0+6,0	63	400	20	5,0-6,0	533
451.250	250	2,4	3,0	88	300	24	3,0	533
451.251	250	3,0	4,0	88	300	24	4,0	533
451.252	250	4,4	5,0+6,0	88	300	24	5,0-6,0	533

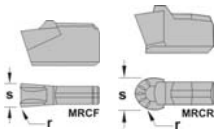




FRC

FRCR

REF.	s	r
FRC 1,6	1,6	0,15
FRC 2,2	2,2	0,20
FRC 3,0	3,0	0,20
FRC 4,0	4,0	0,20
FRC 5,0	5,0	0,30
FRC 6,0	6,0	0,30
FRCR 3,0	3,0	1,50
FRCR 4,0	4,0	2,00
FRCR 5,0	5,0	2,50
FRCR 6,0	6,0	3,00



For more information see page: A.44

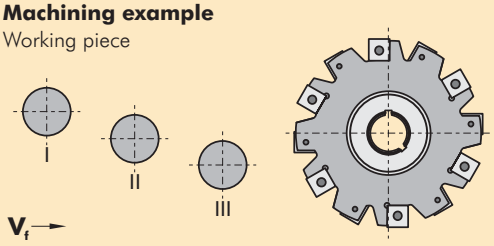
Cutting data for slot side and face milling cutters

Cutting speed nominal values

Material		HB	Basic qualities			
			TIN25	PM25	KM15	TL40
			Cutting speed m/min.			
P	**Unalloyed steel**	90-250	100-210	80-180		
	Low alloyed steel	130-400	50-150	50-140		
	High alloyed steel	150-500	30-90	40-90		
	Martensitic, stainless steel ferritic	150-270	100-200	80-130		40-80
	Steel castings	150-200	60-130	40-90		
M	**Austenitic, stainless steel**	150-270	80-180	50-120		20-50
	Titanium	300-450			20-80	
K	**Malleable cast iron**	110-230			60-90	
	Grey cast iron	180-260			80-120	
	Nodular cast iron	160-250			60-80	
	Aluminium alloys				200-600	
	Bronze and brass alloys	60-150			70-150	

Machining example

Working piece



Examples

Average chip thickness(h_m) mm

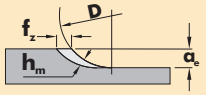
I	0,08 - 0,09
II	0,08
III	0,07 - 0,08

Example I: $f_z \sim$ hm

Example III: $f_z = h_m \sqrt{\frac{D}{a_e}}$

Example II: f_z must be calculated between examples I and II

f_z = Feed per tooth
D = Milling cutter diameter
a_e = Radial cutting depth
h_m = Average chip thickness



Feed nominal values

Depending on the milling cutter situation and in relationship with its diameter and the cutting depth, the average chip thickness (hm) can considerably vary, but it will always be smaller than the feed per tooth.
When you mill a groove, the feed is distributed between two stepped inserts, wich are symmetrically spaced one at each side of the milling cutter, forming together the slot. Therefore, when you use the formulae, the z value (number of teeth) must always be divided by two.

Cutting data for slot side and face milling cutters

Cutting speed nominal values - hm 0,05-0,12

Material		HB	TIN25	PM25	TL40
			Cutting speed m/min.		
P	**Unalloyed steel**	110-310	140-240	130-250	70-135
	Low alloyed steel	125-450	130-210	85-180	45-80
	High alloyed steel	150-500	120-80	60-120	30-65
	Stainlees	150-270			40-90
	Steel castings	150-250	130-210	55-115	25-60

Material		HB	TL40	KM15
			Cutting speed m/min.	
M	**Austenitic, stainless steel**		40-90	
	Titanium			20-80

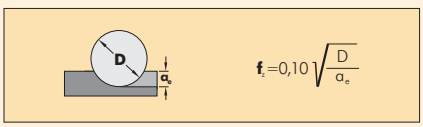
Material		HB	KM15	PM25
			Cutting speed m/min.	
K	**Malleable cast iron**	110-230	60-90	55-100
	Grey cast iron	180-260	80-120	60-120
	Nodular cast iron-S. graphite	160-250	60-80	40-80
	Aluminium alloys	30-100	200-600	
	Bronze and brass alloys	60-150	70-150	

Feed nominal values

The chip average Thickness (hm) must be 0,10mm.

This corresponds to a feed per tooth of 0,3mm in most of the operations made by a side and face milling cutter.

If the radial cutting depth (a2) is too smal compared with the milling cutter diameter, use the following formula:

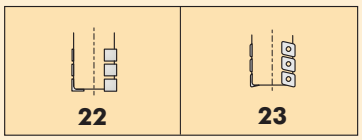


NOTE: In order to calculate the table feeds, use the halfth of the inserts in a three cut milling cutter and a face milling cutter in order to get the effective number of teeth.

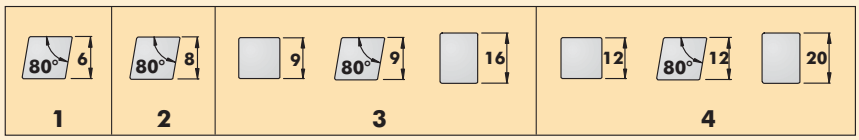
Table feed = rpm x number of effective teeth x f_z

2 2	4	0	90	050	90
1	2	3	4	5	6

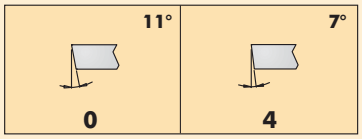
1



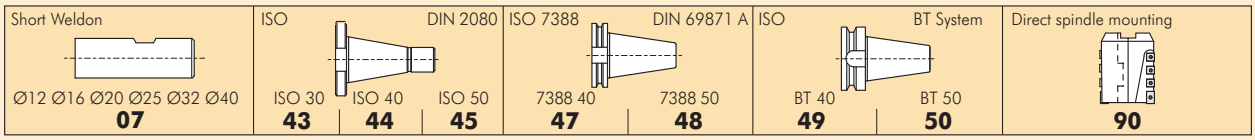
2



3



4

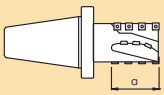


5

Diameter, mm.

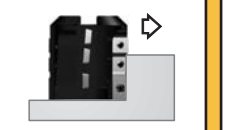
6

Cutting length



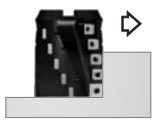
Porcupine milling cutters - Coupeurs de fraisage de porc-épic - Stachelschweinprägescherblöcke

209
Slot and side milling 90°



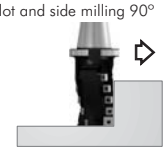
Page K.44 AP.. 2004..
SPM.. 1204..

249
Slot and side milling 90°



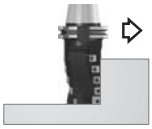
Page K.44 SC.. 09T3..
SC.. 1204..

207
Slot and side milling 90°



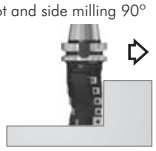
Page K.44 SC.. 09T3..
SC.. 1204..

217
Slot and side milling 90°



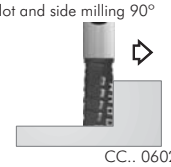
Page K.45 SC.. 09T3..
SC.. 1204..

227
Slot and side milling 90°



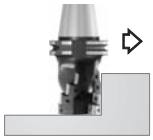
Page K.45 SC.. 09T3..
SC.. 1204..

204
Slot and side milling 90°



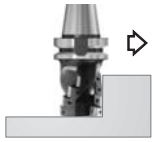
Page K.45 CC.. 0602..
CC.. 0803..
CC.. 09T3..

373-374
Slot and side milling 90°



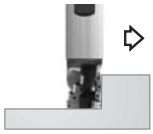
Page K.46 AP.. 1604..

332-333
Slot and side milling 90°



Page K.46 AP.. 1604..

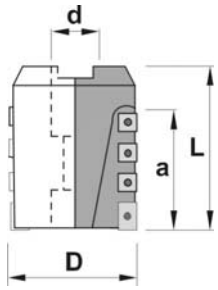
372
Slot and side milling 90°



Page K.46 AP.. 1003..
AP.. 1604..

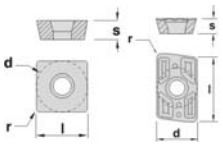
209

REF.	D	d	L	a	Z	AP..	SPM..			
209.050	50	22	70	48	1+2	2004..(1)	1204..(11)	159	522	910
209.063	63	27	70	58	2+2	2004..(2)	1204..(10)	159	522	912
209.080	80	32	80	68	3+2	2004..(2)	1204..(16)	159	522	916
209.100	100	40	90	78	3+3	2004..(3)	1204..(21)	159	522	920
209.125	125	40	100	88	4+4	2004..(4)	1204..(32)	159	522	-



SPMW APMT

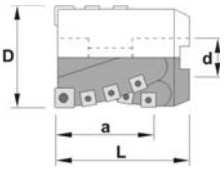
REF.	l	s	d
SPM.. 1204..	12,70	4,76	12,70
AP.. 2004..	20,00	4,76	12,70

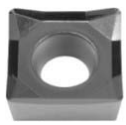


For more information see page: A.37,38,51

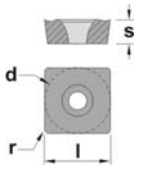
249

REF.	D	L	d	a	Z	SC..				
249.065	63	80	27	65	2+2	2+18	150	522	140	535	912
249.075	80	90	32	75	2+3	2+22	150	522	140	535	916
249.085	100	100	40	85	3+3	3+36	150	522	140	535	920
249.095	125	110	40	95	4+4	4+52	150	522	140	535	-





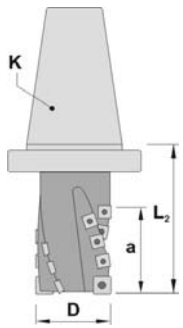
REF.	l	s	d
SC.. 09T3..	9,52	3,97	9,52
SC.. 1204..	12,70	4,76	12,70



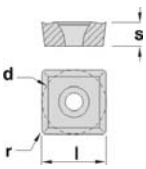
For more information see page: A.47,48

207

REF.	D	K	L_2	a	Z	SC..				
207.040	40	40	105	60	1+2	1+13	140	535	150	522
207.050	50	40	105	65	1+2	1+14	140	535	150	522
207.043	40	50	123	70	1+2	1+14	140	535	150	522
207.053	50	50	128	75	1+2	1+16	140	535	150	522
207.063	63	50	133	80	2+2	2+22	140	535	150	522
207.081	80	50	138	85	2+3	2+28	140	535	150	522
207.100	100	50	148	95	3+3	3+39	140	535	150	522



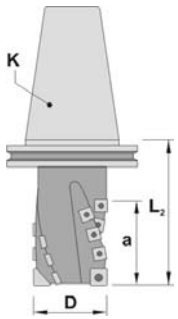
REF.	l	s	d
SC.. 09T3..	9,52	3,97	9,52
SC.. 1204..	12,70	4,76	12,70



For more information see page: A.47,48

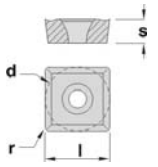
217

REF.	D	K	L2	a	Z	SC..				
217.040	40	40	105	60	1+2	1+13	140	535	150	522
217.050	50	40	105	65	1+2	1+14	140	535	150	522
217.043	40	50	123	70	1+2	1+14	140	535	150	522
217.053	50	50	128	75	1+2	1+16	140	535	150	522
217.063	63	50	133	80	2+2	2+22	140	535	150	522
217.081	80	50	138	85	2+3	2+28	140	535	150	522
217.100	100	50	148	95	3+3	3+39	140	535	150	522



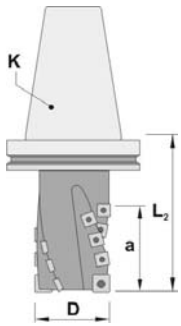
REF.	l	s	d
SC.. 09T3..	9,52	3,97	9,52
SC.. 1204..	12,70	4,76	12,70

For more information see page: A.47,48



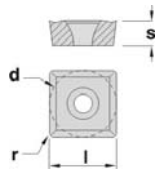
227

REF.	D	K	L2	a	Z	SC..				
227.040	40	40	105	60	1+2	1+13	140	535	150	522
227.050	50	40	105	65	1+2	1+14	140	535	150	522
227.043	40	50	123	70	1+2	1+14	140	535	150	522
227.053	50	50	128	75	1+2	1+16	140	535	150	522
227.063	63	50	133	80	2+2	2+22	140	535	150	522
227.081	80	50	138	85	2+3	2+28	140	535	150	522
227.100	100	50	148	95	3+3	3+39	140	535	150	522



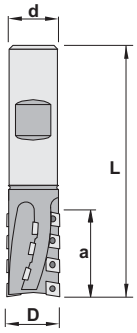
REF.	l	s	d
SC.. 09T3..	9,52	3,97	9,52
SC.. 1204..	12,70	4,76	12,70

For more information see page: A.47,48



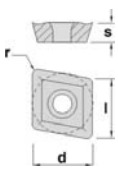
204

REF.	D	d	L	a	Z	CC..		
204.025	25	25	125	30	2+2	0602..(12)	125	517
204.026	25	25	125	43	2+2	0602..(16)	125	517
204.032	32	32	130	30	2+2	0803..(12)	130	518
204.033	32	32	130	43	2+2	0803..(16)	130	518
204.040	40	32	130	30	2+2	09T3..(10)	140	535
204.041	40	32	130	43	2+2	09T3..(12)	140	535



REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 0803..	8,05	3,18	7,94
CC.. 09T3..	9,65	3,97	9,52

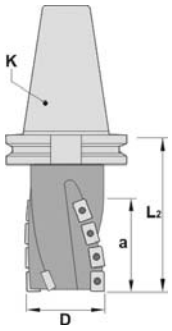
For more information see page: A.38



KIMU

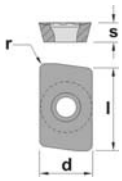
373-374

REF.	D	K	L2	a	Z	AP.		
373.065	50	40	105	65	3	1604..	140	535
374.065	50	50	105	65	3	1604..	140	535
374.065	63	50	130	65	3	1604..	140	535
374.085	80	50	140	80	3	1604..	140	535



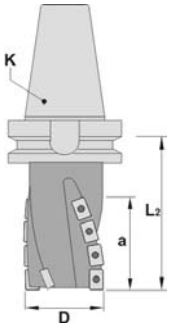
REF.	l	s	d
AP.. 1604..	16,00	4,76	9,52

For more information see page: A.36,37



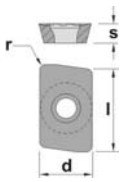
332-333

REF.	D	K	L2	a	Z	AP.		
332.065	50	40	105	65	3	1604..	140	535
333.065	50	50	105	65	3	1604..	140	535
333.065	63	50	130	65	3	1604..	140	535
333.085	80	50	140	80	3	1604..	140	535



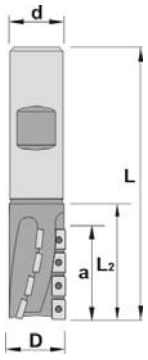
REF.	l	s	d
AP.. 1604..	16,00	4,76	9,52

For more information see page: A.36,37



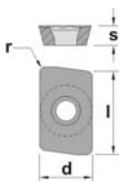
372

REF.	D	L	L2	d	a	Z	AP.		
372.037	25	110	50	25	37	2	1003..	155	507
372.045	32	125	55	32	45	2	1604..	138	515
372.050	40	125	65	32	50	3	1604..	138	515



REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35
AP.. 1604..	16,00	4,76	9,52

For more information see page: A.36,37

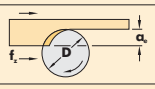


Cutting data for porcupine milling cutters

Material P	HB	Condition	Tool diameter D mm.	Basic qualities TIN25	TIN41	PM25	KM15	Feed/tooth complete slot f_2
				Cutting speed m/min.				
Unalloyed steel	110 170 250	C<0,25% C<0,8% C<1,4%	20-32 40-50	250-300 150-200 100-150		150-200 100-140 70-110		0,12-0,22 0,15-0,39
Low alloyed steel	125-225 220-450	Annealed Hardened	20-32 40-50	150-200 90-140	100-150 60-110	90-140 60-110		0,10-0,21 0,15-0,34
High alloyed steel	150-250 250-500	Annealed Hardened	20-32 40-50	130-170 90-120	80-120	80-120 50-80		0,10-0,21 0,15-0,34
Stainless steel	150-270	Martensitic/Ferritic	20-32 40-50	140-190	120-160	100-130		0,12-0,22 0,15-0,34
Steel castings	150 150-220 160-200	Unalloyed Low alloyed High alloyed	20-32 40-50	130-170 110-150 80-120		80-110 50-90 50-80		0,12-0,22 0,15-0,34
Stainless steel castings	200	Martensitic/Ferritic	20-32		50-80			0,10-0,21 0,15-0,34

Material	HB	Condition	Tool diameter D mm.	Basic qualities TIN25	TIN41	PM25	KM15	Feed/tooth complete slot f_2
				Cutting speed m/min.				
Stainless steel	150-220	Austenitic	20-32 40-50		80-160	70-130		0,12-0,23 0,15-0,37
Stainless steel castings	200	Austenitic	20-32 40-50		40-70	40-60		0,10-0,21 0,15-0,34
Heat resistant alloys **Nickel or cobalt base**	140-300 300-475	Annealed or treated solution Aged	20-32 40-50				15-25 12-20	0,05-0,07 0,07-0,10
Titanium alloys	300-340 320-380	Annealed or treated solution	20-32 40-50				40-80 30-60	0,07-0,10 0,10-0,15

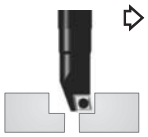
Material K	HB	Condition	Tool diameter D mm.	Basic qualities TIN25	TIN41	PM25	KM15	Feed/tooth complete slot f_2
				Cutting speed m/min.				
Malleable cast iron	110-145 200-230	Short chipping Long chipping	20-32 40-50				60-80 50-70	0,12-0,23 0,15-0,37
Grey cast iron	180 260	Low tensile strenght High tensile strenght, alloyed	20-32 40-50				70-100 50-80	0,12-0,23 0,15-0,37
Nodular cast iron **Spheroidal graphite**	160 250	Ferritic Pearlitic	20-32 40-50				40-60 30-50	0,10-0,21 0,15-0,34
Aluminium alloys	60-150 40-180	Forged Cast	20-32 40-50				300-500 250-450	0,23-0,39 0,31-0,60
Bronze-brass alloys	60-150		20-32 40-50				80-120	0,15-0,31 0,23-0,39



D/a_e	50	40	20	10	5	2,5	2	1,5	1
f_1	4,5	4	3	2	1,5	1	1	1	1

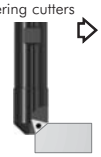
When you trace a contour (side peripherical milling), you must multiply the f_2 value of a complete slot (see table) by the correction factor f_1 corresponding to the relationship D/a_e (milling cutter diameter/radial cutting depth) in order to get a suitable feed.

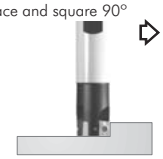
Specific applications - Applications spécifiques - Spezifische Anwendungen

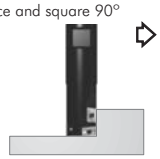
224-234
Spot facing milling cutters

Page K.49 CC.. 0602.. CC.. 09T3..

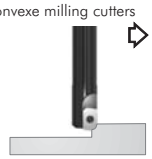
624
Chamfering cutters

Page K.50 TC.. 1102..

724
Chamfering cutters

Page K.50 TC.. 1102..

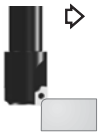
200
Face and square 90°

Page K.52 AP.. 1003..

220
Face and square 90°

Page K.52 AP.. 1003..

116
Convexe milling cutters

Page K.54 ADM.. 1503..

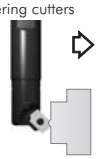
231
Concave milling cutters

Page K.55 ADM.. 1503..

235
Concave milling cutters

Page K.55 ADM.. 1503..

162-163-164
Chamfering cutters

Page K.57 TC.. 1102.. TC.. 16T3..

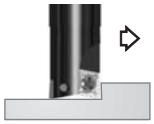
125-126
Chamfering cutters

Page K.58 ADM.. 1503..

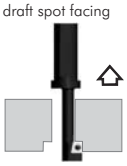
135-136
Chamfering cutters

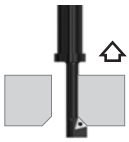
Page K.58 ADM.. 1503..

174-175
Chamfering cutters

Page K.59 SC.. 1204..

304-314
Multi-function

Page K.59 CCKT 0602.. CCKT 1204..

961
Back draft spot facing

Page K.61 CC.. 0602.. CC.. 09T3..

962
Back draft countersink

Page K.61 CC.. 0602.. CC.. 1102..

Kits - Ensembles - Sätze

KIT MAXICUT
Spot facing milling cutters

Page K.49 CC.. 0602.. CC.. 09T3..

KIT MINICUT
Chamfering cutters

Page K.51 TC.. 1102..

KIT 200
Face and square 90°

Page K.53 AP.. 1003..

KIT 116
Convexe milling cutters

Page K.54 ADM.. 1503..

KIT 231
Concave milling cutters

Page K.56 ADM.. 1503..

KIT MULTICUT
Chamfering cutters

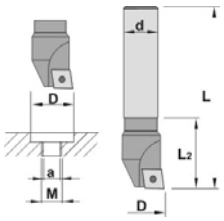
Page K.57 TC.. 1102.. TC.. 16T3..

KIT CCKT
Multi-function

Page K.60 CCKT 0602.. CCKT 1204..

224-234

REF.	D	L	d	a	L2	Z	CC..		
224.011	11	85	12	4	15	1	0602..	155	507
224.014	14	85	12	5	19	1	0602..	155	507
234.017	17	95	16	5	30	1	09T3..	138	515
234.019	19	95	16	5	32	1	09T3..	138	515
234.022	22	95	16	6	32	1	09T3..	138	515
234.025	25	95	16	8	32	1	09T3..	138	515

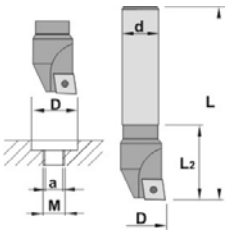


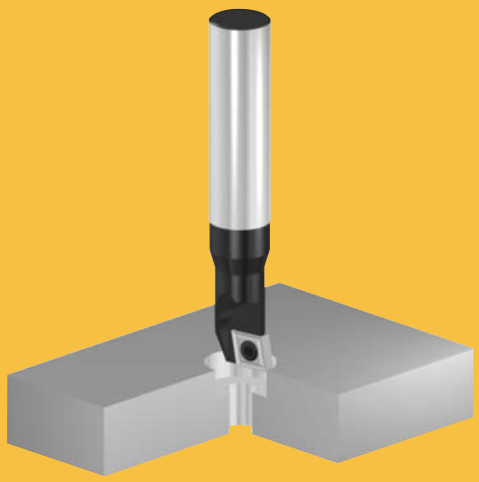
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

For more information see page: A.38

KIT MAXICUT

REF.	D	d	a	L	L2	M	Z	CC..		
224.011	11	12	4	85	15	M6	1	0602..	155	507
224.014	14	12	5	85	19	M8	1	0602..	155	507
234.017	17	16	5	95	30	M10	1	09T3..	138	515
234.019	19	16	5	95	32	M12	1	09T3..	138	515
234.022	22	16	6	95	32	M14	1	09T3..	138	515
234.025	25	16	8	95	32	M16	1	09T3..	138	515



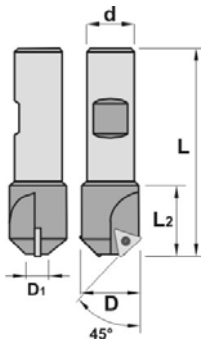


REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

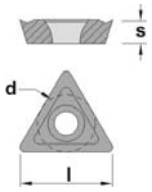
For more information see page: A.38

624

REF.	D	D1	L	L2	d	Z	TC..		
624.016	16	1,2	70	24	12	1	1102..	155	507
624.021	21	8,5	90	30	20	2	1102..	155	507



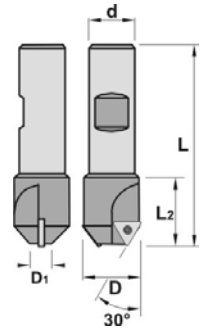
REF.	l	s	d
TC.. 1102..	11,00	2,38	6,35



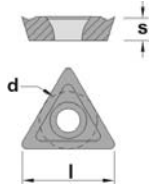
For more information see page: A.51,52

724

REF.	D	D1	L	L2	d	Z	TC..		
724.016	16	5,4	70	24	12	1	1102..	155	507
724.026	26	15,8	90	30	20	2	1102..	155	507



REF.	l	s	d
TC.. 1102..	11,00	2,38	6,35

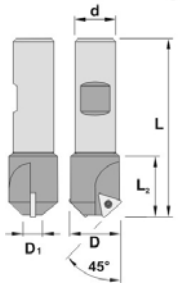


For more information see page: A.51,52

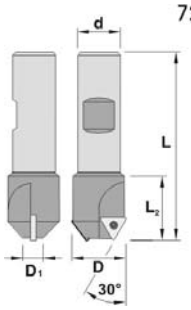
KIT MINICUT

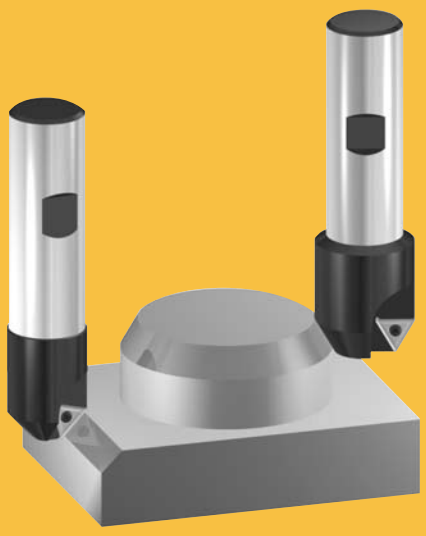
REF.	D1	D	L	L2	d	Z	TC..		
624.016	1,2	16	70	24	12	1	1102..	155	507
624.021	8,5	21	90	30	20	2	1102..	155	507
724.016	5,4	16	70	24	12	1	1102..	155	507
724.026	15,8	26	90	30	20	2	1102..	155	507

624

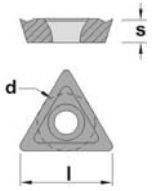


724





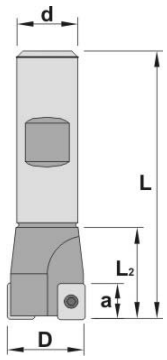
REF.	l	s	d
TC.. 1102..	11,00	2,38	6,35



For more information see page: A.51,52

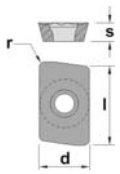
200

REF.	D	L	d	a	L2	Z	AP..		
200.012	12	85	16	10	25	1	1003..	155	507
200.016	16	85	16	10	25	2	1003..	155	507
200.020	20	90	20	10	30	3	1003..	155	507



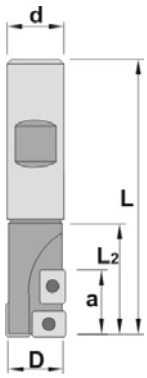
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

For more information see page: A.36,37



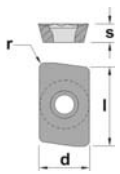
220

REF.	D	L	d	a	L2	Z	AP..		
220.020	20	90	20	19	35	1+1	1003..	155	507



REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35

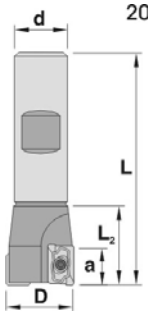
For more information see page: A.36,37



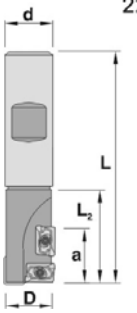
KIT 200

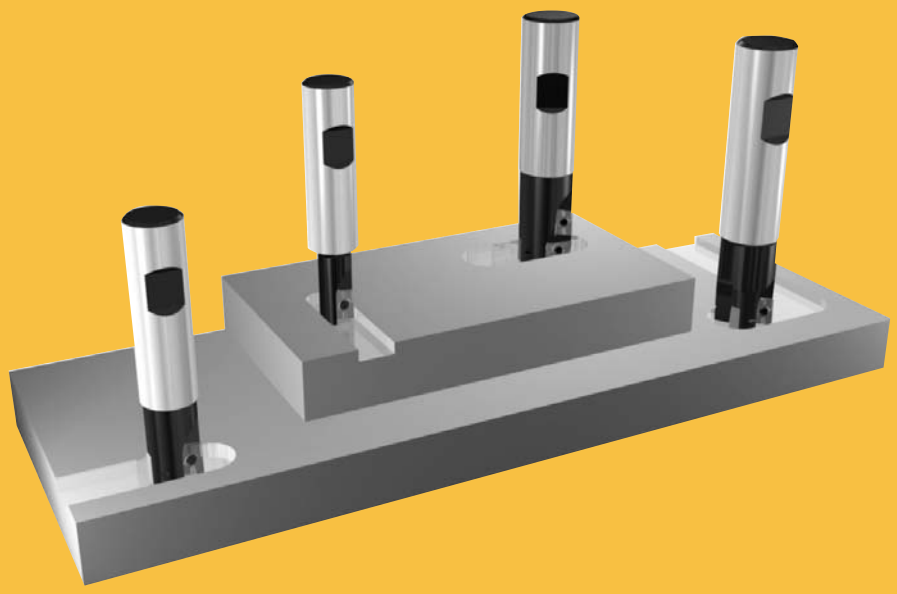
REF.	D	d	a	L	L2	Z	AP..		
200.012	12	16	10	85	25	1	1003..	155	507
200.016	16	16	10	85	25	2	1003..	155	507
200.020	20	20	10	90	30	3	1003..	155	507
220.020	20	20	19	90	35	1+1	1003..	155	507

200

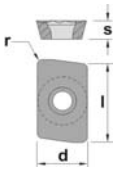


220





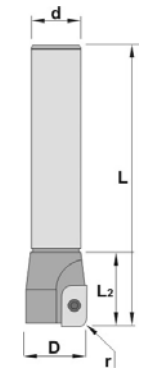
REF.	l	s	d
AP.. 1003..	9,52	3,18	6,35



For more information see page: A.36,37

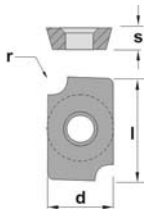
116

REF.	D	L	d	L2	rmin	rmax	Z	ADMW		
116.01601	16	120	20	35	1,0	3,0	1	1503R1.0/2.5	138	515
116.01603	16	120	20	35	3,5	6,0	1	1503R3.0/6.0	138	515



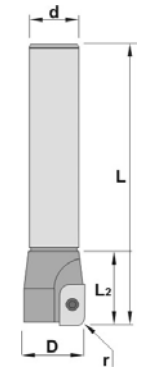
REF.	r	s	d
ADMW 1503R1.0-C	1,00	3,18	9,52
ADMW 1503R1.5-C	1,50	3,18	9,52
ADMW 1503R2.0-C	2,00	3,18	9,52
ADMW 1503R2.5-C	2,50	3,18	9,52
ADMW 1503R3.0-C	3,00	3,18	9,52
ADMW 1503R3.5-C	3,50	3,18	9,52
ADMW 1503R4.0-C	4,00	3,18	9,52
ADMW 1503R4.5-C	4,50	3,18	9,52
ADMW 1503R5.0-C	5,00	3,18	9,52
ADMW 1503R6.0-C	6,00	3,18	9,52

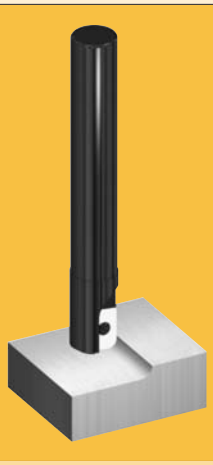
For more information see page: A.36



KIT 116

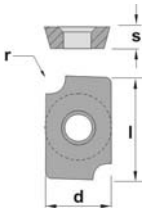
REF.	D	L	d	L2	rmin	rmax	Z	ADMW		
116.01601	16	120	20	35	1,0	3,0	1	1503R1.0/2.5	138	515
116.01603	16	120	20	35	3,5	6,0	1	1503R3.0/6.0	138	515





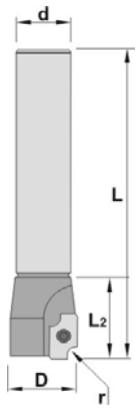
REF.	r	s	d
ADMW 1503R1.0-C	1,00	3,18	9,52
ADMW 1503R1.5-C	1,50	3,18	9,52
ADMW 1503R2.0-C	2,00	3,18	9,52
ADMW 1503R2.5-C	2,50	3,18	9,52
ADMW 1503R3.0-C	3,00	3,18	9,52
ADMW 1503R3.5-C	3,50	3,18	9,52
ADMW 1503R4.0-C	4,00	3,18	9,52
ADMW 1503R4.5-C	4,50	3,18	9,52
ADMW 1503R5.0-C	5,00	3,18	9,52
ADMW 1503R6.0-C	6,00	3,18	9,52

For more information see page: A.36



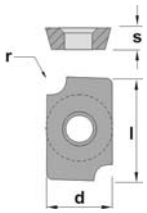
231

REF.	D	L	d	L2	rmin	rmax	Z	ADMW		
231.1701	17	120	16	30	1,0	2,5	1	1503R1.0/2.5	138	515
231.1703	17	120	16	30	3,0	6,0	1	1503R3.0/6.0	138	515



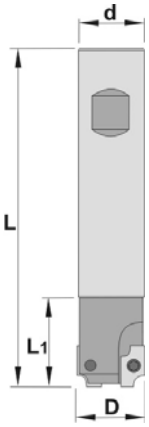
REF.	r	s	d
ADMW 1503R1.0	1.0	3,18	9,52
ADMW 1503R1.5	1.5	3,18	9,52
ADMW 1503R2.0	2.0	3,18	9,52
ADMW 1503R2.5	2.5	3,18	9,52
ADMW 1503R3.0	3.0	3,18	9,52
ADMW 1503R3.5	3.5	3,18	9,52
ADMW 1503R4.0	4.0	3,18	9,52
ADMW 1503R4.5	4.5	3,18	9,52
ADMW 1503R5.0	5.0	3,18	9,52
ADMW 1503R6.0	6.0	3,18	9,52

For more information see page: A.36



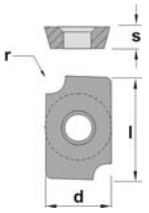
235

REF.	D	L	d	L1	rmin	rmax	Z	ADMW		
235.02201	22	120	20	35	1,0	2,5	1	1503R1.0/2.5	138	515
235.02203	22	120	20	40	3,0	6,0	1	1503R3.0/6.0	138	515



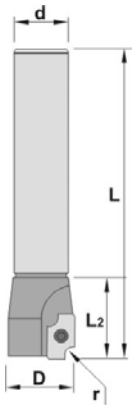
REF.	r	s	d
ADMW 1503R1.0	1.0	3,18	9,52
ADMW 1503R1.5	1.5	3,18	9,52
ADMW 1503R2.0	2.0	3,18	9,52
ADMW 1503R2.5	2.5	3,18	9,52
ADMW 1503R3.0	3.0	3,18	9,52
ADMW 1503R3.5	3.5	3,18	9,52
ADMW 1503R4.0	4.0	3,18	9,52
ADMW 1503R4.5	4.5	3,18	9,52
ADMW 1503R5.0	5.0	3,18	9,52
ADMW 1503R6.0	6.0	3,18	9,52

For more information see page: A.36



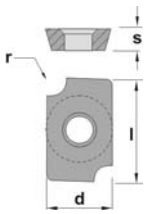
KIT 231

REF.	D	d	L	L2	rmin	rmax	Z	ADMW		
231.1701	17	16	120	30	1,0	2,5	1	1503R1.0/2.5	138	515
231.1703	17	16	120	30	3,0	6,0	1	1503R3.0/6.0	138	515



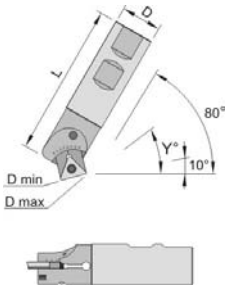
REF.	r	s	d
ADMW 1503R1.0	1.0	3,18	9,52
ADMW 1503R1.5	1.5	3,18	9,52
ADMW 1503R2.0	2.0	3,18	9,52
ADMW 1503R2.5	2.5	3,18	9,52
ADMW 1503R3.0	3.0	3,18	9,52
ADMW 1503R3.5	3.5	3,18	9,52
ADMW 1503R4.0	4.0	3,18	9,52
ADMW 1503R4.5	4.5	3,18	9,52
ADMW 1503R5.0	5.0	3,18	9,52
ADMW 1503R6.0	6.0	3,18	9,52

For more information see page: A.36

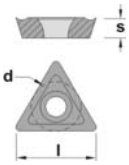


162-163-164

REF.	D	L	Y	Dmin	Dmax	Z	TC..				
162.020	20	100	10° - 80°	5	20	1	1102..	621	125	445	507
163.025	25	100	10° - 80°	5	23	1	16T3..	626	140	476	515
164.025	25	175	10° - 80°	5	23	1	16T3..	626	140	476	515



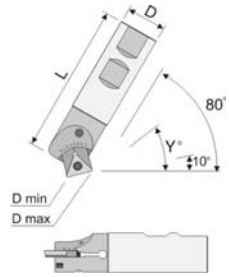
REF.	l	s	d
TC.. 1102..	11,00	2,38	6,35
TC.. 16T3..	16,50	3,97	9,52

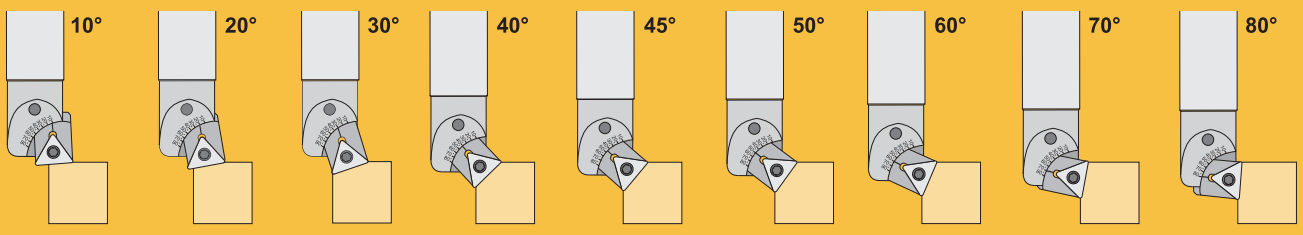


For more information see page: A.51,52

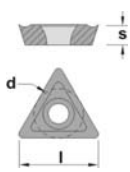
KIT MULTICUT

REF.	D	L	Y	Dmin	Dmax	TC..			
162.020	20	100	10°	5	26	1102..	621	125	507
	20	100	20°	8	27	1102..	621	125	507
	20	100	30°	10	27	1102..	621	125	507
	20	100	40°	13	27	1102..	621	125	507
	20	100	45°	14	27	1102..	621	125	507
	20	100	50°	15	27	1102..	621	125	507
	20	100	60°	17	26	1102..	621	125	507
	20	100	70°	19	25	1102..	621	125	507
	20	100	80°	20	24	1102..	621	125	507
163.025	25	100	10°	5	32	16T3..	626	138	515
	25	100	20°	6	33	16T3..	626	138	515
	25	100	30°	7	34	16T3..	626	138	515
	25	100	40°	10	33	16T3..	626	138	515
	25	100	45°	11	33	16T3..	626	138	515
	25	100	50°	13	32	16T3..	626	138	515
	25	100	60°	16	31	16T3..	626	138	515
	25	100	70°	19	29	16T3..	626	138	515
	25	100	80°	23	27	16T3..	626	138	515





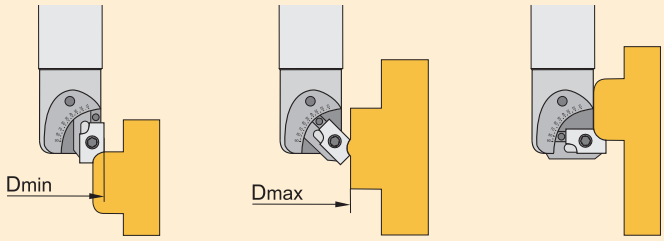
REF.	l	s	d
TC.. 1102..	11,00	2,38	6,35
TC.. 16T3..	16,50	3,97	9,52

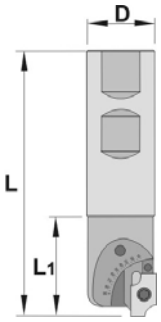


For more information see page: A.51,52

125-126

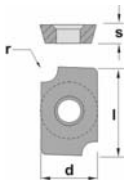
REF.	D	L	L1	Dmin	Dmax	Z	ADMW				
125.025	25	104	37	26,5	33,0	1	1503	6925	140	476	515
126.025	25	178	37	26,5	33,0	1	1503	6925	140	476	515





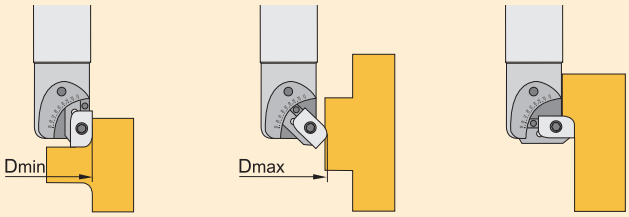
REF.	r	s	d
ADMW 1503R1.0	1,0	3,18	9,52
ADMW 1503R1.5	1,5	3,18	9,52
ADMW 1503R2.0	2,0	3,18	9,52
ADMW 1503R2.5	2,5	3,18	9,52
ADMW 1503R3.0	3,0	3,18	9,52
ADMW 1503R3.5	3,5	3,18	9,52
ADMW 1503R4.0	4,0	3,18	9,52
ADMW 1503R4.5	4,5	3,18	9,52
ADMW 1503R5.0	5,0	3,18	9,52

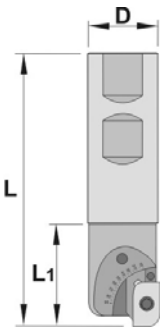
For more information see page: A.36



135-136

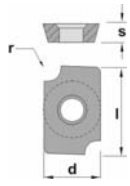
REF.	D	L	L1	Dmin	Dmax	Z	ADMW				
135.025	25	104	37	26,5	34,0	1	1503	696	140	476	515
136.025	25	178	37	26,5	34,0	1	1503	696	140	476	515





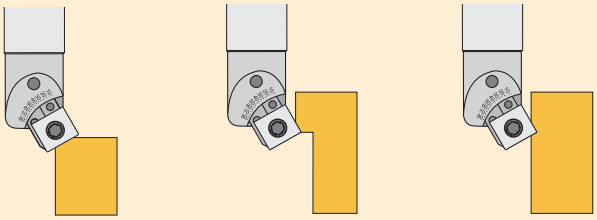
REF.	r	s	d
ADMW 1503R1.0-C	1,0	3,18	9,52
ADMW 1503R1.5-C	1,5	3,18	9,52
ADMW 1503R2.0-C	2,0	3,18	9,52
ADMW 1503R2.5-C	2,5	3,18	9,52
ADMW 1503R3.0-C	3,0	3,18	9,52
ADMW 1503R3.5-C	3,5	3,18	9,52
ADMW 1503R4.0-C	4,0	3,18	9,52
ADMW 1503R4.5-C	4,5	3,18	9,52
ADMW 1503R5.0-C	5,0	3,18	9,52
ADMW 1503R6.0-C	6,0	3,18	9,52

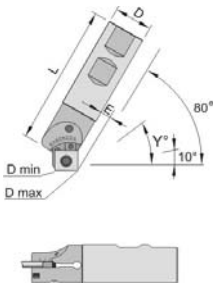
For more information see page: A.36



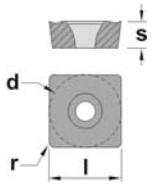
174-175

REF.	D	L	Y	Dmin	Dmax	Z	SC..				
174.025	29	101	10°	7,5	30,0	1	1204..	697	734	476	520
175.025	29	176	20°	10,0	32,0	1	1204..	697	734	476	520
			30°	13,0	32,5						
			40°	16,5	33,5						
			45°	17,5	33,5						
			50°	19,0	33,5						
			60°	22,0	33,5						
			70°	24,5	32,5						
			80°	27,0	31,0						





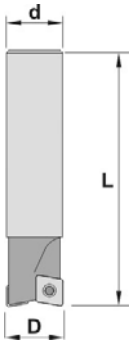
REF.	l	s	d
SC.. 1204..	12,70	4,76	12,70



For more information see page: A.47,48

304-314

REF.	D	d	L	Z	CCKT				
304.012	12	16	100	1	060204	155	-	507	-
304.016	16	16	100	2	060204 / 080308	155	148	507	508
304.020	20	20	125	2	080308 / 09T308	148	138	508	515
304.025	25	25	125	2	09T308 / 120408	138	144	515	-
314.012	12	16	150	1	060204	155	-	507	-
314.016	16	16	175	2	060204 / 080308	155	148	507	508
314.020	20	20	175	2	080308 / 09T308	148	138	508	515
314.025	25	25	200	2	09T308 / 120408	138	144	515	-

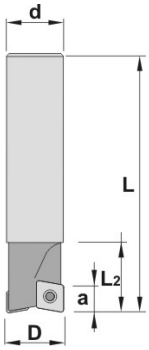


REF.	l	s	d
CCKT 0602..	6,45	2,38	6,35
CCKT 0803..	8,05	3,18	7,94
CCKT 09T3..	9,65	3,97	9,52
CCKT 1204..	12,90	4,76	12,70

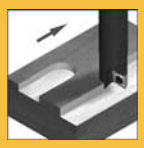
For more information see page: A.38

CCKT

REF.	D	d	L	L2	a	Z	CCKT				
304.012	12	16	100	25	5,0	1	060204	155	-	507	-
304.016	16	16	100	25	5,0	2	060204/080308	155	148	507	508
304.020	20	20	125	32	7,0	2	080308/09T308	148	138	508	515
304.025	25	25	125	40	7,6	2	09T308/120408	138	144	515	520
314.012	12	16	150	25	5,0	1	060204	155	-	507	-
314.016	16	16	175	25	5,0	2	060204/080308	155	148	507	508
314.020	20	20	175	32	7,0	2	080308/09T308	148	138	508	515
314.025	25	25	200	40	7,6	2	09T308/120408	138	144	515	-

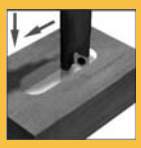


Side slot milling

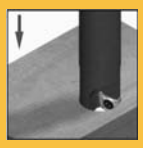


Downward cutting

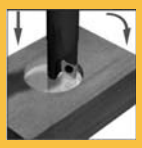
Pocketing



Boring



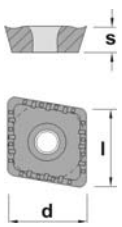
Boring Expanding



Profiling

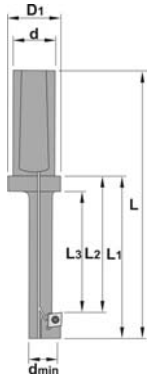
REF.	l	s	d
CCKT 0602..	6,45	2,38	6,35
CCKT 0803..	8,05	3,18	7,94
CCKT 09T3..	9,65	4,00	9,52
CCKT 1204..	12,90	4,76	12,70

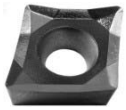
For more information see page: A.38



961

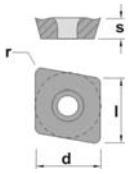
REF.	D	dmin	d	L	L1	L2	L3	D1	Z	CC..		
961.018	18	10,5	20	112	62	47	40	25	1	0602..	155	507
961.020	20	13,0	20	113	63	52	45	25	1	0602..	155	507
961.024	24	15,0	20	118	68	57	50	25	1	0602..	155	507
961.026	26	17,0	20	128	78	67	60	25	1	0602..	125	507
961.030	30	19,0	20	138	88	77	70	25	1	0602..	125	507
961.033	33	21,0	20	152	102	82	75	25	1	09T3..	138	515





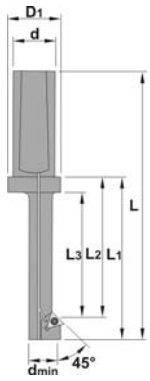
REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
CC.. 09T3..	9,65	3,97	9,52

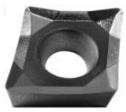
For more information see page: A.38



962

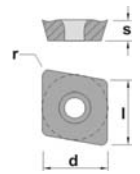
REF.	D	dmin	d	L	L1	L2	L3	D1	Z	CC../TC..		
962.015	15	10	20	105	55	42	35	25	1	0602..	155	507
962.020	20	14	20	110	60	47	40	25	1	0602..	155	507
962.023	23	17	20	120	70	57	50	25	1	1102..	125	507
962.027	27	21	20	140	90	77	70	25	1	1102..	125	507
962.031	31	24	20	150	100	87	80	25	1	1102..	125	507

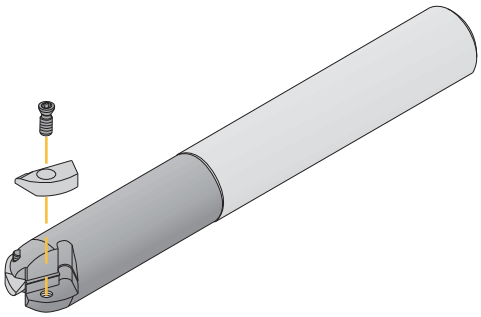




REF.	l	s	d
CC.. 0602..	6,45	2,38	6,35
TC.. 1102..	11,00	2,38	6,35

For more information see page: A.38,51,52





Screw clamping

Since the advent of the Torx screw it has been possible to hold with complete safety positive inserts with center hole. Our range covers all the screw clamping permutations.

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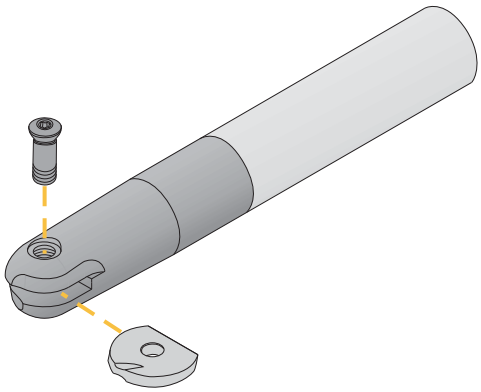

Center screw clamping

Grinded high accurancy center screws ensures that the insert is firmly fixed. This clamping system is only used for finishing applications.

Grinded high accurancy center screws ensures that the insert is firmly fixed. This clamping system is only used for finishing applications.

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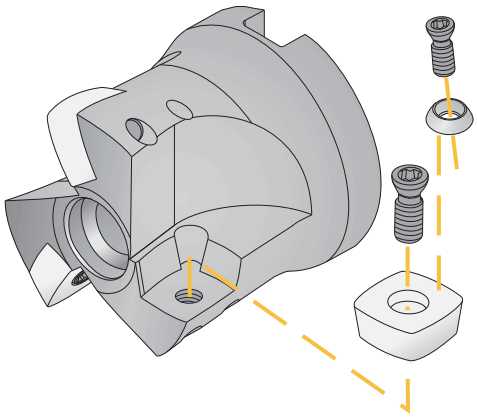

Double clamping

Heavy duty work require good fixation, for this purpose we have as designed our double clamping system, one of the safest available.

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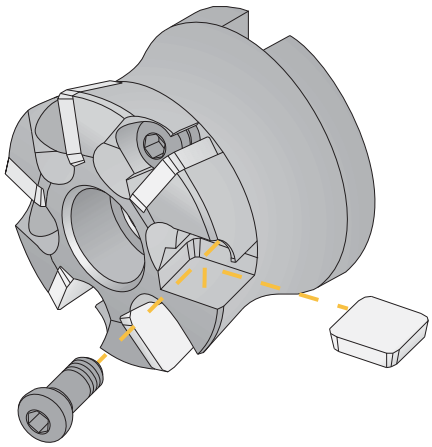


Wedge screw

This easy and clean clamping system has been designed for the high feed cutters with flat inserts. The wedge screw clamping system offers good chip evacuation and easy use.

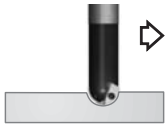
This easy and clean clamping system has been designed for the high feed cutters with flat inserts. The wedge screw clamping system offers good chip evacuation and easy use.

This easy and clean clamping system has been designed for the high feed cutters with flat inserts. The wedge screw clamping system offers good chip evacuation and easy use.

Profile milling - Fraisage de profil - Profilprägen

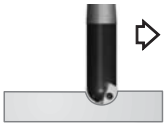
Roughing ball bose - Nez de boule de dégroissage - Roughingkugelnase

354-355
Roughing (Cylindric)



Page K.64
IN.. 25
IN.. 32

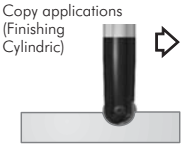
356
Roughing (Morse)



Page K.64
IN.. 32
...
IN.. 50

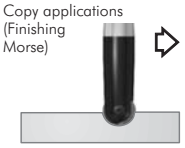
Finishing ball nose - Nez de finiton de boule - Beendenkugelnase

236-237
Copy applications (Finishing Cylindric)



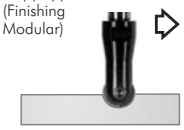
WPR 10
...
WPR 32
Page K.66

853-854
Copy applications (Finishing Morse)



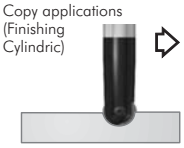
WPR 20
...
WPR 32
Page K.66

856
Copy applications (Finishing Modular)



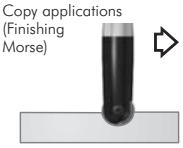
WPR 10
...
WPR 25
Page K.66

880-881
Copy applications (Finishing Cylindric)



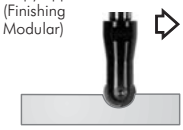
RPR 10
...
RPR 32
Page K.67

883-884
Copy applications (Finishing Morse)



RPR 20
...
RPR 32
Page K.67

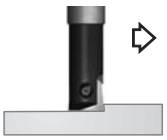
886
Copy applications (Finishing Modular)



RPR 10
...
RPR 25
Page K.67

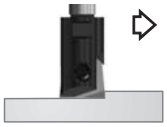
Toroidal cutters - Coupeurs toroidal - Toroidal Scherblöcke

891 Back draft cutter Cylindric



MTK 12
MTK ..
MTK 25
Page K.68

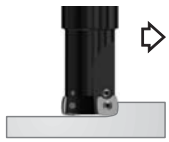
896 Back draft cutter Modular



MTK 10
MTK ..
MTK 25
Page K.68

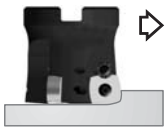
High feed - Haute alimentation - Hohe Zufuhr

165
High feed



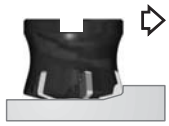
XDKW 0904..
Page K.71

166
High feed



XDKW 1204..
Page K.71

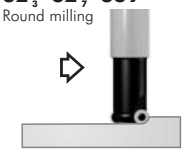
140
High feed



SP.. 1203..
Page K.71

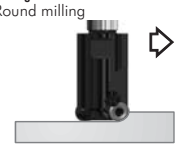
Round inserts - Insertions rondes - Runde Einsätze

32 0/3 -32 4/6/7 -339
Round milling



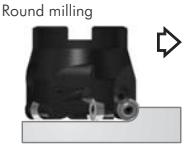
RD.. 0702..
...
RD.. 1604..
Page K.74

35 2/5/8 -330
Round milling



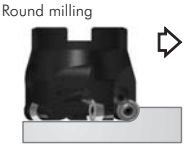
RD.. 0702..
...
RD.. 1604..
Page K.74

329-331
Round milling



RD.. 12T3MO
RD.. 1604MO
Page K.74

251
Round milling



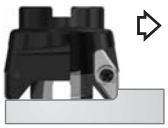
RPM.. 1204..
Page K.75

Aluminium die cutting - Découpage d'aluminium - Aluminium Stempelschneiden

144 General application

VC.. 1103..
VC.. 2205..
Page K.78

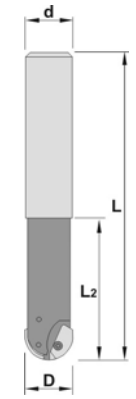
244
General application



VC.. 2205..
Page K.78

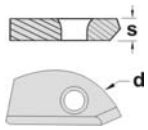
354-355

REF.	D	d	L	L2	Z	IN..		
354.025	25	25	115	57	2	25	131	535
354.032	32	32	115	57	2	32	159	522
355.025	25	25	150	76	2	25	131	535
355.032	32	32	150	76	2	32	159	522



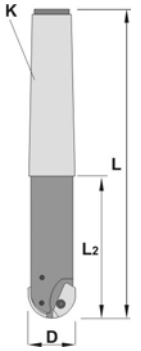
REF.	l	s	d
IN.. 25	-	4,5	12,5
IN.. 32	-	5,6	16,0

For more information see page: A.44,45



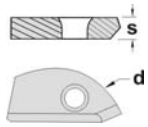
356

REF.	D	K	L	L2	Z	IN..		
356.032	32	4	228	119	2	32	159	522
356.040	40	5	231	95	2	40	150	522
356.050	50	5	231	95	2	50	490	562

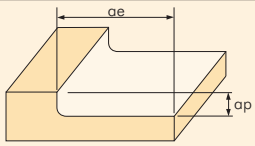


REF.	l	s	d
IN.. 32	-	5,6	16,0
IN.. 40	-	5,6	20,0
IN.. 50	-	7,9	25,0

For more information see page: A.44,45



Recommended cutting conditions

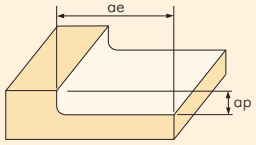


Slotting

Material	m/min Cutting Speed	mm/tooth Feed rate	⌀20 min-1	⌀20 mm/min	⌀25 min-1	⌀25 mm/min	⌀30 min-1	⌀30 mm/min	⌀40 min-1	⌀40 mm/min
Carbon Steels (200 HB)	150-250	0,06-0,2	3500	440	2800	550	2330	720	1430	440
			Vc=220m/min						Vc=180m/min	
			ap=0,3D							
Alloy Steels (200-250 HB)	150-230	0,05-0,2	3180	330	2550	450	2120	420	1270	340
			Vc=200m/min						Vc=160m/min	
			ap=0,3D							
Alloy Steels (25-35 HRC)	100-160	0,03-0,15	2070	110	1660	210	1380	180	870	170
			Vc=130m/min						Vc=110m/min	
			ap=0,3D							
Hardened Steels Pre-Harden Steels (40-45 HRC)	60-120	0,02-0,13	1100	50	890	80	740	80	560	100
			Vc=70m/min							
			ap=0,3D							
Cast Iron (150HB)	140-240	0,06-0,2	3500	440	2800	660	2330	540	1430	540
			Vc=220m/min						Vc=180m/min	
			ap=0,3D							

Note
- These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
- For long type please reduce speed and feed by 70%.
- In case of using Long Shank Type, no relation to diameters, basic conditions are:
  n=700min^{-1} Vf=210m/min ap=0,1D ae=0,3D

Recommended cutting conditions



Side Milling

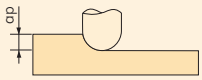
Material	m/min Actual Maximum Cutting Speed	mm/tooth Feed rate	⌀20		⌀25		⌀32		⌀40	
			min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min
Carbon Steels (200 HB)	150-250	0,15-0,6	3500	4200	2800	3360	2330	2800	1430	1720
			Vc=220m/min ap<=1,0mm ae=0,3D							
		0,1-0,3	3500	650	2800	880	2330	720	1430	540
			Vc=220m/min ap=0,5mm ae=0,3D							
Alloy Steels (200-250 HB)	120-200	0,15-0,6	3180	3820	2550	3060	2120	2550	1270	1530
			Vc=200m/min ap<=1,0mm ae=0,3D							
		0,08-0,3	3180	540	2550	660	2120	530	1270	410
			Vc=200m/min ap=0,5mm ae=0,3D							
Alloy Steels (25-35 HRC)	60-120	0,08-0,6	2070	2500	1660	2000	1380	1650	870	1050
			Vc=130m/min ap<=1,0mm ae=0,3D							
		0,05-0,3	2070	440	1660	540	1380	460	870	330
			Vc=130m/min ap=0,5mm ae=0,3D							
Alloy Steels Pre-Harden Steels (40-45 HRC)	50-100	0,07-0,6	1110	1330	890	1070	740	900	560	670
			Vc=70m/min ap<=1,0mm ae=0,3D							
		0,05-0,3	1110	150	890	200	740	200	560	100
			Vc=70m/min ap=0,5mm ae=0,3D							
Cast Iron (150HB)	120-240	0,15-1,2	3500	4200	2800	3360	2230	2800	1430	1720
			Vc=220m/min ap<=1,0mm ae=0,3D							
		0,1-0,3	3500	650	2800	900	2230	900	1430	540
			Vc=220m/min ap=0,5mm ae=0,3D							

Note

- The cutting data in the table show conditions for VB30=0,3mm (flank wear 30min tool-life).
  Overhang is the length below the chuck (l b)

- RPM for high-speed machines is calculated using the following formula: $\text{Revolution Speed} = \frac{500 \times \text{Actual Maximum Cutting Speed}}{\pi \times \sqrt{2 \times R \times ap - ap^2}}$

- Actual Maximum Cutting Speed:
  ap=0,5mm and 1mm
  Maximum Cutting Speed at boundary of contact part with work material under the above recommended cutting condition



- Cutting conditions on high-speed machine tools are recommended for contouring path milling.

- 3-5° slant milling is recommended for pocketing using a 70% feed rate, please reduce slant angle below 3° for harder materials. Please use machine guards when cutting steel due to flying chips.

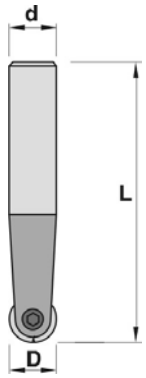
Deep Side Milling

Material	m/min Cutting Speed	mm/tooth Feed rate	⌀20		⌀25		⌀30		⌀40	
			min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min
Carbon Steels (200 HB)	120-200	0,08-0,2	2700	420	2160	530	1800	440	1110	420
			Vc=170m/min						Vc=140m/min	
			ap=1,2D ae=0,1D							
Alloy Steels (200-250 HB)	120-200	0,06-0,2	2550	320	2040	430	1700	350	1270	410
			Vc=160m/min						Vc=130m/min	
			ap=1,2D ae=0,1D							
Alloy Steels (25-35 HRC)	100-160	0,05-0,15	1750	220	1400	330	1170	270	790	300
			Vc=110m/min						Vc=100m/min	
			ap=1,2D ae=0,1D							
Hardened Steels Pre-Harden Steels (40-45 HRC)	60-120	0,04-0,13	960	70	760	100	640	100	480	90
			Vc=60m/min							
			ap=1,2D ae=0,1D							
Cast Iron (150HB)	140-220	0,08-0,2	2700	420	2160	530	1800	440	1110	420
			Vc=170m/min						Vc=140m/min	
			ap=1,2D ae=0,1D							

KIMU

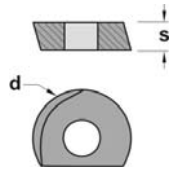
236-237

REF.	D	d	L	Z	WPR		
236.010	10	12	105	2	10	152	535
236.012	12	16	105	2	12	132	522
236.016	16	20	105	2	16	134	522
236.020	20	25	125	2	20	139	522
236.025	25	32	125	2	25	142	537
236.032	32	32	125	2	32	160	537
237.010	10	12	150	2	10	152	535
237.012	12	16	160	2	12	132	522
237.016	16	20	180	2	16	134	522
237.020	20	25	200	2	20	139	522
237.025	25	32	220	2	25	142	537
237.032	32	32	250	2	32	160	537



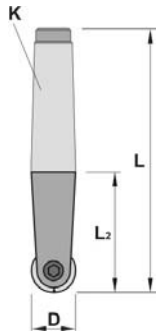
REF.	l	s	d
WPR 10	-	2,40	10,00
WPR 12	-	2,50	12,00
WPR 16	-	3,00	16,00
WPR 20	-	3,00	20,00
WPR 25	-	4,00	25,00
WPR 32	-	5,00	32,00

For more information see page: A.58



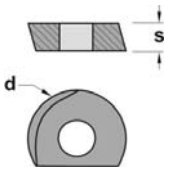
853-854

REF.	D	K	L	L2	Z	WPR		
853.020	20	3	190	115	2	20	139	522
854.025	25	4	215	135	2	25	142	537
854.032	32	4	268	160	2	32	160	537



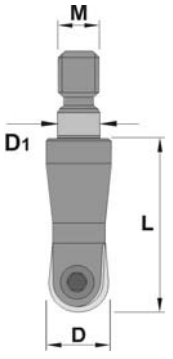
REF.	l	s	d
WPR 20	-	3,00	20,00
WPR 25	-	4,00	25,00
WPR 32	-	5,00	32,00

For more information see page: A.58



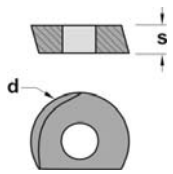
856

REF.	D	L	M	D1	Z	WPR		
856.010	10	23	M6	6,5	2	10	152	515
856.012	12	23	M6	6,5	2	12	132	520
856.016	16	30	M8	8,5	2	16	134	520
856.020	20	35	M10	10,5	2	20	139	520
856.025	25	40	M12	12,5	2	25	142	537



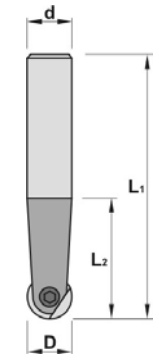
REF.	l	s	d
WPR 10	-	2,40	10,00
WPR 12	-	2,50	12,00
WPR 16	-	3,00	16,00
WPR 20	-	3,00	20,00
WPR 25	-	4,00	25,00

For more information see page: A.58



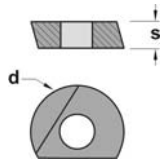
880-881

REF.	D	L1	d	L2	Z	RPR		
880.010	10	105	10	50	2	10	463	518
880.012	12	105	12	50	2	12	464	510
880.016	16	105	16	50	2	16	469	535
880.020	20	125	20	70	2	20	139	522
880.025	25	125	25	70	2	25	142	537
880.032	32	125	32	70	2	32	160	537
881.010	10	150	10	80	2	10	463	518
881.012	12	160	12	90	2	12	464	510
881.016	16	180	16	100	2	16	469	535
881.020	20	200	20	120	2	20	139	522
881.025	25	220	25	140	2	25	142	537
881.032	32	250	32	160	2	32	160	537



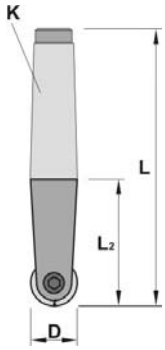
REF.	l	s	d
RPR 10	-	2,60	10,00
RPR 12	-	3,00	12,00
RPR 16	-	4,00	16,00
RPR 20	-	5,00	20,00
RPR 25	-	6,00	25,00
RPR 32		7,00	32,00

For more information see page: A.47



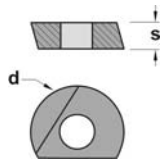
883-884

REF.	D	L	K	L2	Z	RPR		
883.020	20	190	3	115	2	20	139	522
884.025	25	215	4	135	2	25	142	537
884.032	32	268	4	160	2	32	160	537



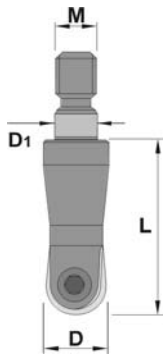
REF.	l	s	d
RPR 20	-	5,00	20,00
RPR 25	-	6,00	25,00
RPR 32	-	7,00	32,00

For more information see page: A.47



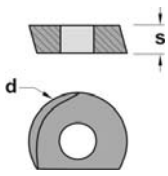
886

REF.	D	L	M	D1	Z	RPR		
886.010	10	23	M6	6,5	2	10	463	508
886.012	12	23	M6	6,5	2	12	464	530
886.016	16	30	M8	8,5	2	16	469	515
886.020	20	30	M10	10,5	2	20	139	520
886.025	25	35	M12	12,5	2	25	142	537



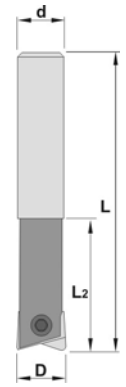
REF.	l	s	d
RPR 10	-	2,60	10,00
RPR 12	-	3,00	12,00
RPR 16	-	4,00	16,00
RPR 20	-	5,00	20,00
RPR 25	-	6,00	25,00

For more information see page: A.47



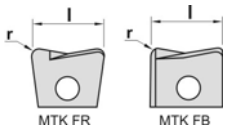
891

REF.	D	L	d	L2	Z	MTK		
891.012	12	110	12	53	2	12	464	518
891.016	16	125	16	63	2	16	469	510
891.020	20	140	20	75	2	20	479	535
891.025	25	180	25	90	2	25	142	537



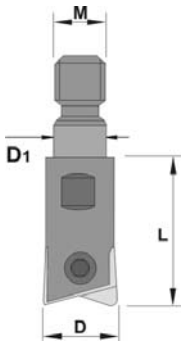
REF.	l	r
MTK 12	12,00	1,00
MTK 16	16,00	1,30
MTK 20	20,00	1,60
MTK 25	25,00	2,00

For more information see page: A.45



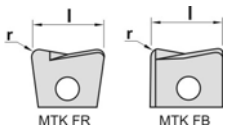
896

REF.	D	L	M	D1	Z	MTK		
896.010	10	23	M6	6,5	2	10	463	508
896.012	12	23	M6	6,5	2	12	464	530
896.016	16	30	M8	8,5	2	16	469	515
896.020	20	30	M10	10,5	2	20	479	520
896.025	25	35	M12	12,5	2	25	142	537



REF.	l	r
MTK 10	10,00	0,60
MTK 12	12,00	1,00
MTK 16	16,00	1,30
MTK 20	20,00	1,60
MTK 25	25,00	2,00

For more information see page: A.45



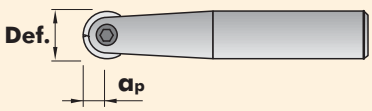
Recommended cutting conditions

Material	m/min Cutting speed	mm/tooth Feed rate	⌀8		⌀10		⌀12			
			min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min		
Carbon Steels Alloy Steels (30 HRC)	100-200	0,2-0,3	6370	2550	5090	2040	4240	1700		
			Vc=160m/min fz=0,2mm/tooth ap=0,025D ae=0,1D							
Carbon Steels Alloy Steels (30-40 HRC)	80-150	0,2-0,3	4770	1910	3820	1530	3180	1270		
			Vc=120m/min fz=0,2mm/tooth ap=0,025D ae=0,1D							
Die Tool Steels Pre-Harden Steels (30-40 HRC)	70-100	0,1-0,15	3180	640	2550	510	2120	420		
			Vc=80m/min fz=0,1mm/tooth ap=0,025D ae=0,1D							
Hardened Steels (55-65 HRC)	200-250	0,2-0,4	9150	3660	7320	2930	6100	2440		
			Vc=230m/min fz=0,2mm/tooth ap=0,01D ae=0,02D							
Cast Iron	100-200	0,3-0,4	6730	3820	5090	3050	4240	2550		
			Vc=160m/min fz=0,3mm/tooth ap=0,025D ae=0,1D							

Material	m/min Cutting speed	mm/tooth Feed rate	⌀16		⌀20		⌀25		⌀30(32)	
			min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min
Carbon Steels Alloy Steels (30 HRC)	100-200	0,2-0,3	2400	1600	2550	1300	2050	1030	1700	850
			Vc=160m/min fz=0,25mm/tooth ap=0,05D ae=0,1D							
Carbon Steels Alloy Steels (30-40 HRC)	80-150	0,2-0,3	1600	1200	1910	955	1530	765	1280	640
			Vc=120m/min fz=0,25mm/tooth ap=0,05D ae=0,1D							
Die Tool Steels Pre-Harden Steels (30-40 HRC)	70-100	0,1-0,15	3200	385	1280	310	1020	245	850	205
			Vc=80m/min fz=0,12mm/tooth ap=0,05D ae=0,1D							
Hardened Steels (55-65 HRC)	200-250	0,2-0,4	4575	2740	3660	2200	2930	1760	2440	1460
			Vc=230m/min fz=0,3mm/tooth ap=0,01D ae=0,02D							
Cast Iron	100-200	0,3-0,4	3200	2240	2550	1790	2050	1440	1700	1190
			Vc=160m/min fz=0,35mm/tooth ap=0,05D ae=0,1D							

Note
- According to the machining situation, refer to the table above to determine the cutting conditions.
- Be sure to practice safety instructions and precaucions such as wearing glasses and safety shoes, and placing safety covers when you use this tool. Because this tool can be broken during machining so failure to follow these instructions may cause personal injury.
- Never attempt to modify the carbide shank holder. Use the value for the depth of cut (ap) when the carbide shank holder is used.
  Mill diameters D=8~12mm:ap<=0,2mm.
  Mill diameters D=16~32mm:ap<=0,3mm.

$$n = \frac{Vc \cdot 1000}{\pi \cdot Def.} \text{ (Rev/min)}$$

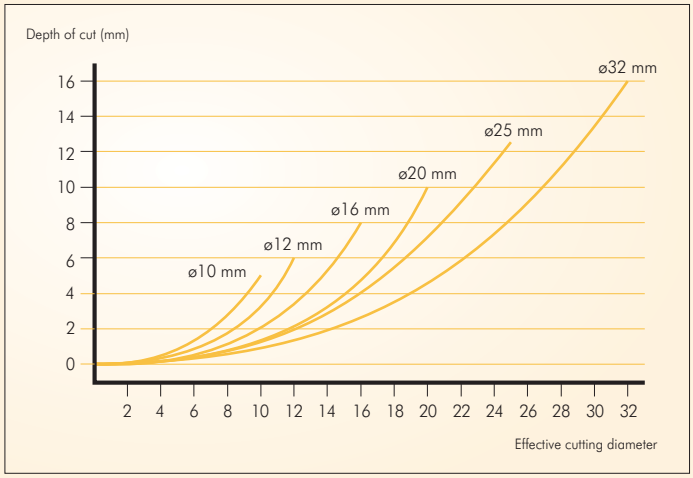


N = Spindle speed (Rev/min.)

Vc = Cutting speed

Def. = Effective cutting diameter

a_p = Max. Depth of cut (mm)



Recommended cutting conditions

Material	m/min Cutting speed	mm/tooth Feed rate	⌀10		⌀12	
			min^{-1}	mm/min	min^{-1}	mm/min
Carbon Steels Alloy Steels (30 HRC)	100-200	0,1-0,2	5090	2040	4240	1700
			Vc=160m/min fz=0,2mm/tooth ap=0,025D ae=0,1D			
Carbon Steels Alloy Steels (30-40 HRC)	80-150	0,1-0,2	3820	1530	3180	1270
			Vc=120m/min fz=0,2mm/tooth ap=0,025D ae=0,1D			
Die Tool Steels Pre-Harden Steels (30-40 HRC)	70-100	0,05-0,1	2550	510	2120	420
			Vc=80m/min fz=0,1mm/tooth ap=0,025D ae=0,1D			
Hardened Steels (55-65 HRC)	130-180	0,05-0,1	5090	1020	4240	850
			Vc=160m/min fz=0,1mm/tooth ap=0,01D ae=0,02D			
Cast Iron	100-200	0,2-0,3	5090	3050	4240	2550
			Vc=160m/min fz=0,3mm/tooth ap=0,025D ae=0,1D			

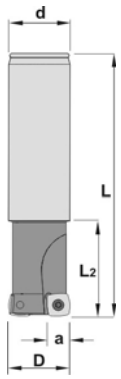
Material	m/min Cutting speed	mm/tooth Feed rate	⌀16		⌀20		⌀25		⌀30(32)	
			min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min	min^{-1}	mm/min
Carbon Steels Alloy Steels (30 HRC)	100-200	0,1-0,2	3200	1600	2550	1300	2050	1030	1700	850
			Vc=160m/min fz=0,25mm/tooth ap=0,05D ae=0,1D							
Carbon Steels Alloy Steels (30-40 HRC)	80-150	0,1-0,2	2400	1200	1910	955	1530	765	1280	640
			Vc=120m/min fz=0,25mm/tooth ap=0,05D ae=0,1D							
Die Tool Steels Pre-Harden Steels (30-40 HRC)	70-100	0,05-0,1	1600	385	1280	310	1020	245	850	205
			Vc=80m/min fz=0,12mm/tooth ap=0,05D ae=0,1D							
Hardened Steels (55-65 HRC)	130-180	0,05-0,1	3180	950	2550	760	2040	610	1700	510
			Vc=160m/min fz=0,15mm/tooth ap=0,01D ae=0,02D							
Cast Iron	100-200	0,2-0,3	3200	2240	2550	1790	2050	1440	1700	1190
			Vc=160m/min fz=0,35mm/tooth ap=0,05D ae=0,1D							

Note

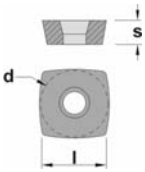
- According to the machining situation, refer to the table above to determine the cutting conditions.
- Be sure to practice safety instructions and precaucions such as wearing glasses and safety shoes, and placing safety covers when you use this tool.
- Because this tool can be broken during machining so failure to follow these instructions may cause personal injury.
- Never attempt to modify the carbide shank holder. Use the value for the depth of cut (ap) when the carbide shank is used.
  Mill diameters D=8~12mm:ap<=0,05D.
  Mill diameters D=16~32mm:ap<=0,1D.
- PCA12M grade is suitable for not so high speed machining.

165

REF.	D	L	L_2	d	a	Z	XDKW		
165.020	20	110	35	20	13	2	090430	451	530
165.025	25	110	40	25	13	2	090430	451	530
165.032	32	125	40	32	13	3	090430	451	530



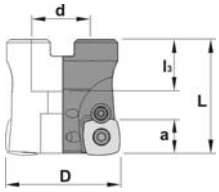
REF.	l	s	d
XDKW 090430	9,00	4,76	9,00



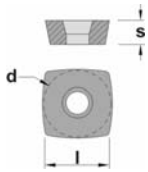
For more information see page: A.58

166

REF.	D	L	d	l_3	a	Z	XDKW			
166.040	40	40	16	20	14	4	120430	138	535	108
166.050	50	40	22	22	14	5	120430	140	535	910
166.063	63	50	27	25	14	6	120430	140	535	912
166.080	80	50	27	25	14	7	120430	140	535	917

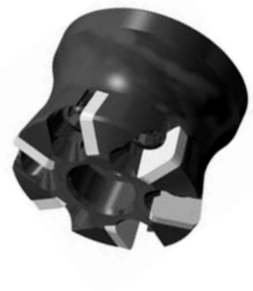


REF.	l	s	d
XDKW 120430	12,50	4,76	12,50

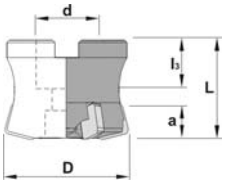


For more information see page: A.58

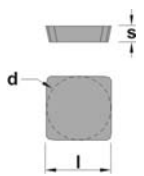
140



REF.	D	L	d	l_3	a	Z	SP..						
140.050	50	40	22	20	9	5	1203..	666	112	535	103	312	911
140.063	63	50	27	22	9	5	1203..	666	112	535	103	312	912
140.080	80	50	32	25	9	6	1203..	666	112	535	103	312	917
140.100	100	50	40	29	9	7	1203..	666	112	535	103	312	920



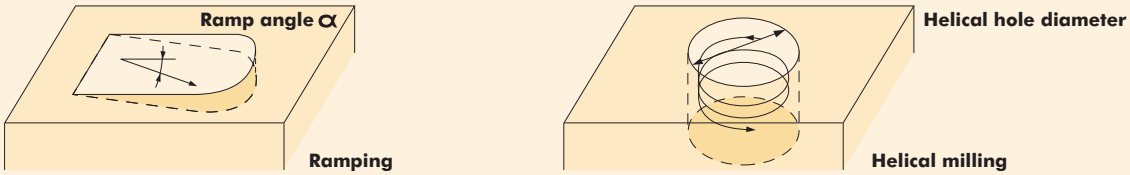
REF.	l	s	d
SP.. 1203..	12,70	3,18	12,70



For more information see page: A.50,51

Processing by direct milling is also possible

Since the cutting flute do not extend to the center, there are limitations on the ramp angle and hole diameter, but as shown below, processing by direct milling without a pilot hole is possible for ramping and helical milling.



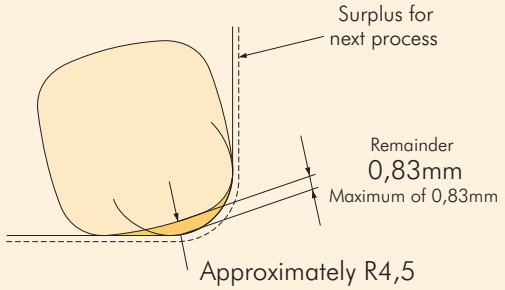
Tool diameter	⌀32	⌀40	⌀50	⌀63	⌀80	⌀100
Maximum ramp angle α	7°	4,5°	3°	1,7°	1°	1°
Hole diameter	⌀44-61	⌀61-76	⌀80-96	⌀107-122	⌀142-156	⌀179-195

Note -The ramp angle α should be set within the ranges listed above. Use at ramp angles of 1° or less recommended.
-For hole diameters outside the ranges listed above, a pilot hole should be drilled before milling.

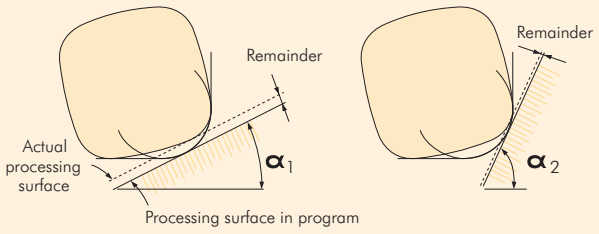
Method for defining conditions of insert tip programmatically

For roughing processing, please create a program with corner R values close to those shown as references below.

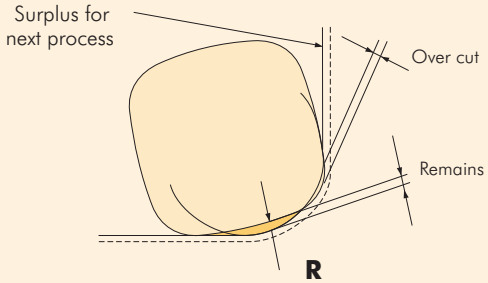
When corner R is set to 4,5



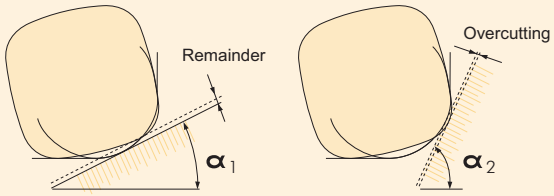
Normally, you should create a program with an input corner R of approximately 4,5.
At an approximate input corner R of 4,5, there is no overcutting.



When corner R is set larger



Although overcutting occurs when the approximate R is set to higher values, if the overcutting is with in the surplus for the next process, there is no problem with the processing shape and the amount of remainder can be supressed.



Approximate input corner R	R4,5	R5,1	R5,5	R5,8	R6,1	R6,4
Remainder	0,83 (α1=22,1°)	0,66 (α1=20,3°)	0,55 (α1=19°)	0,47 (α1=17,9°)	0,39 (α1=16,7°)	0,32 (α1=15,4°)
Overcutting	-	0,1 (α2=73,4°)	0,2 (α2=67,7°)	0,3 (α2=64,7°)	0,4 (α2=62,3°)	0,5 (α2=60,5°)

Note
- Overcutting and remainder vary according to the processing shape. The values in the table above are maximum values.
- The values of α shown are the slopes of the processing surfaces when overcutting and remainder are at their maximum respective values.

For example, when a program is created with an approximate R of 5,1:
Remainder of around 0,66mm is left when the slope of the processing surface is approximately 20,3°, and when the slope of the processing surface is approximately 73,4°, about 0,1mm of overcutting occurs. At areas with other slopes, the overcutting and remainder values are below these values.

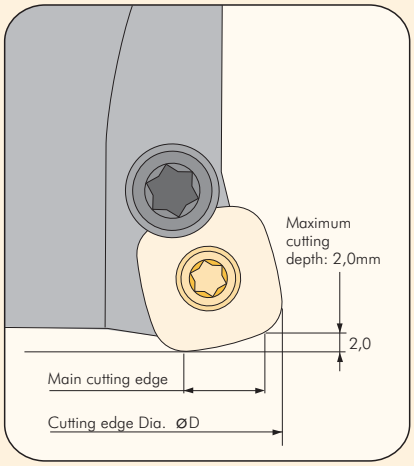
Recommended cutting conditions

Material	Cutting speed Vc (m/min)	Per-flute feed rate fz (mm/tooth)	⌀32 (2 flutes)			⌀40 (3 flutes)			⌀50 (4 flutes)		
			Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min	Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min	Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min
General Structural Steels (200 HB)	180-200	0,6-1,5	1790	5370	171	1430	6400	256	1150	6900	510
			Vc=180m/min fz=1,5mm/tooth ap=1,0mm ae=1,0D						Vc=180 fz=1,5 ap=1,5 ae=1,0		
	90-150	0,6-2,0	895	2690	86	720	3240	130	570	3420	257
			Vc=90m/min fz=1,5mm/tooth ap=1,0mm ae=1,0D						Vc=90 fz=1,5 ap=1,5 ae=1,0		
Carbon Steels Alloy Steels (30 HRC)	180-200	0,6-1,5	1790	5370	171	1430	6400	256	1150	6900	510
			Vc=180m/min fz=1,5mm/tooth ap=1,0mm ae=1,0D						Vc=180 fz=1,5 ap=1,5 ae=1,0		
	90-150	0,6-2,0	895	2690	86	720	3240	130	570	3420	257
			Vc=90m/min fz=1,5mm/tooth ap=1,0mm ae=1,0D						Vc=90 fz=1,5 ap=1,5 ae=1,0		
Carbon Steels Alloy Steels (30-45 HRC)	80-120	0,4-0,8	895	1430	45	720	1730	69	570	1820	130
			Vc=90m/min fz=0,8mm/tooth ap=1,0mm ae=1,0D						Vc=90 fz=0,8 ap=1,5 ae=1,0		
Alloy Steels (45-50 HRC)	70-120	0,02-0,6	995	600	19	790	710	28	630	760	38
			Vc=100m/min fz=0,3mm/tooth ap=1,0mm ae=1,0D						Vc=100 fz=0,3 ap=1,0 ae=1,0		
			700	280	9	550	330	13	440	360	18
			Vc=70m/min fz=0,2mm/tooth ap=0,5mm ae=1,0D						Vc=70 fz=0,2 ap=1,0 ae=1,0		
Alloy Steels(50-55 HRC)	70-100	0,05-0,2	700	280	5	550	330	7	440	350	9
			Vc=70m/min fz=0,2mm/tooth ap=1,0mm ae=1,0D						Vc=70 fz=0,2 ap=0,5 ae=1,0		
Alloy Steels(55-60 HRC)	50-100		500	50	0,8	400	60	1	310	62	1,5
			Vc=50m/min fz=0,05mm/tooth ap=0,5mm ae=1,0D						Vc=50 fz=0,05 ap=0,5 ae=1,0		
Cast Iron	180-200	0,8-2,0	1790	7160	344	1430	8580	515	1150	9200	920
			Vc=180m/min fz=2,0mm/tooth ap=1,5mm ae=1,0D						Vc=180 fz=2,0 ap=2,0 ae=1,0		
	90-150		895	3580	172	720	4320	259	570	4560	456
			Vc=90m/min fz=2,0mm/tooth ap=1,5mm ae=1,0D						Vc=90 fz=2,0 ap=2,0 ae=1,0		

Material	Cutting speed Vc (m/min)	Per-flute feed rate fz (mm/tooth)	⌀63 (4 flutes)			⌀80 (5 flutes)			⌀100 (6 flutes)		
			Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min	Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min	Rotation speed min⁻¹	Feed rate mm/min	Q value cm³/min
General Structural Steels (200 HB)	180-200	0,6-1,5	910	5500	520	720	5400	650	570	5130	770
			Vc=180m/min fz=1,5mm/tooth ap=1,5mm ae=1,0D								
	90-150	0,6-2,0	455	2730	258	360	2700	325	290	2610	390
			Vc=90m/min fz=1,5mm/tooth ap=1,5mm ae=1,0D								
Carbon Steels Alloy Steels (30 HRC)	180-200	0,6-1,5	910	5500	520	720	5400	650	570	5130	770
			Vc=180m/min fz=1,5mm/tooth ap=1,5mm ae=1,0D								
	90-150	0,6-2,0	455	2730	258	360	2700	325	290	2610	390
			Vc=90m/min fz=1,5mm/tooth ap=1,5mm ae=1,0D								
Carbon Steels Alloy Steels (30-45 HRC)	80-120	0,4-0,8	455	1450	140	360	1440	170	290	1400	210
			Vc=90m/min fz=0,8mm/tooth ap=1,5mm ae=1,0D								
Alloy Steels (45-50 HRC)	70-120	0,02-0,6	500	600	38	400	600	48	320	576	58
			Vc=100m/min fz=0,3mm/tooth ap=1,0mm ae=1,0D								
			350	280	18	280	280	22	220	260	26
			Vc=70m/min fz=0,2mm/tooth ap=1,0mm ae=1,0D								
Alloy Steels(50-55 HRC)	70-100	0,05-0,2	350	280	9	270	270	11	220	260	13
			Vc=70m/min fz=0,2mm/tooth ap=0,5mm ae=1,0D								
Alloy Steels(55-60 HRC)	50-100		250	50	1,5	200	50	2,0	160	48	2,4
			Vc=50m/min fz=0,05mm/tooth ap=0,5mm ae=1,0D								
Cast Iron	180-200	0,8-2,0	910	7280	920	720	7200	1150	570	6840	1370
			Vc=180m/min fz=2,0mm/tooth ap=2,0mm ae=1,0D								
	90-150		455	3640	459	360	3600	576	290	3840	696
			Vc=90m/min fz=2,0mm/tooth ap=2,0mm ae=1,0D								

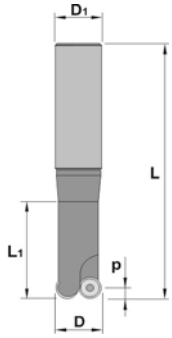
Note
- Select the best cutting condition when working, referring to above list.
(If the overhang is 3D or less, the recommended cutting speed is Vc=180-200m/min; 3D or more: Vc=90-130m/min.)

- Thick and heavy chips are generated by using this tool. Be sure to remove them with air blow in order to avoid any breakage by blocking with chips.
The recommended method is "Spindle center through" when blowing air. (Pay attention when removing chips in cavity work with the machining center <vertical type>.)



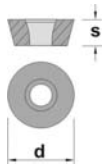
32 0 1 3 -32 4 6 7 -339

REF.	D	L	D1	L1	p	Z	RD..		
320.015	15	100	20	40	3,5	2	0702MO	155	507
321.015	15	150	20	40	3,5	2	0702MO	155	507
320.016	16	100	20	40	3,5	2	0702MO	155	507
321.016	16	150	20	40	3,5	2	0702MO	155	507
323.020	20	100	20	40	5,0	2	1003MO	462	515
324.020	20	150	20	40	5,0	2	1003MO	462	515
326.025	25	125	25	50	6,0	2	12T3MO	462	515
327.025	25	180	25	60	6,0	2	12T3MO	462	515
326.032	32	125	32	50	6,0	3	12T3MO	462	515
327.032	32	180	32	60	6,0	3	12T3MO	462	515
339.032	32	180	32	60	8,0	2	1604MO	467	515



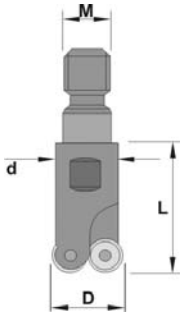
REF.	l	s	d
RD.. 0702MO	-	2,38	7,00
RD.. 1003MO	-	3,18	10,00
RD.. 12T3MO	-	3,97	12,00
RD.. 1604MO	-	4,76	16,00

For more information see page: A.46



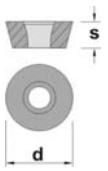
32 2 5 8 -330

REF.	D	L	M	d	Z	RD..		
322.016	16	23	M8	14	2	0702MO	155	507
325.020	20	30	M10	18	2	1003MO	462	515
325.025	25	35	M12	21	3	1003MO	462	515
325.035	35	43	M16	29	4	1003MO	462	515
325.042	42	43	M16	29	5	1003MO	462	515
328.025	25	43	M12	21	2	12T3MO	462	515
328.032	32	43	M16	29	3	12T3MO	462	515
328.035	35	43	M16	29	3	12T3MO	462	515
328.042	42	43	M16	29	4	12T3MO	462	515
330.032	32	43	M16	29	2	1604MO	144	515



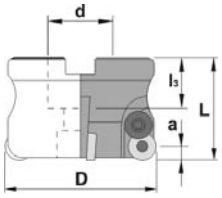
REF.	l	s	d
RD.. 0702MO	-	2,38	7,00
RD.. 1003MO	-	3,18	10,00
RD.. 12T3MO	-	3,97	12,00
RD.. 1604MO	-	4,76	16,00

For more information see page: A.46



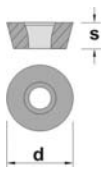
329-331

REF.	D	d	L	l3	a	Z	RD..					
329.052	52	22	50	20	6	5	12T3..	131	239	131	535	910
331.066	66	27	50	22	6	6	12T3..	131	239	131	535	912
331.080	80	27	50	22	6	7	12T3..	131	239	131	535	912
331.052	52	22	50	20	8	4	1604..	144	220	144	535	910
331.066	66	27	50	22	8	5	1604..	144	220	144	535	912
331.080	80	27	50	22	8	6	1604..	144	220	144	535	912
331.100	100	32	55	25	8	7	1604..	144	220	144	535	916
331.125	125	40	55	30	8	8	1604..	144	220	144	535	-
331.160	160	40	55	30	8	9	1604..	144	220	144	535	952



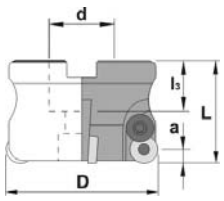
REF.	l	s	d
RD.. 12T3MO	-	3,97	12,00
RD.. 1604MO	-	4,76	16,00

For more information see page: A.46



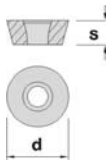
251

REF.	D	d	L	l3	Z	RPM..					
251.040	40	16	40	18	3	1204M0	205	503	140	535	108
251.050	50	22	40	20	4	1204M0	205	503	140	535	910
251.063	63	27	50	22	5	1204M0	205	503	140	535	912
251.080	80	32	50	25	6	1204M0	205	503	140	535	917
251.100	100	40	50	30	7	1204M0	205	503	140	535	920
251.125	125	40	63	30	7	1204M0	205	503	140	535	-
251.160	160	40	63	30	8	1204M0	205	503	140	535	952



REF.	l	s	d
RPM.. 1204M0	-	4,76	12,70

For more information see page: A.47



Recommended cutting conditions

Material	m/min Cutting Speed	mm/tooth Feed rate	ø12 - ø20			ø24 - ø25			ø32 - ø35		
			min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min
Mild Steels (200 HB)	150-250	0,3-0,8	3980	3180	28,6	3180	2540	28,6	2490	2990	43,1
			Vc=250m/min fz=0,4mm/tooth ap=1,5mm ae=0,3D								
			3980	3180	47,7	3180	2540	47,6	2490	2990	71,8
			Vc=250m/min fz=0,4mm/tooth ap=1,5mm ae=0,5D								
Carbon Steels Alloy Steels (30 HRC)	120-230	0,3-0,8	3180	2540	22,9	2550	2040	23	1990	2390	34,4
			Vc=200m/min fz=0,4mm/tooth ap=1,5mm ae=0,3D								
			3180	2540	38,1	2550	2040	38,3	1990	2390	57,4
			Vc=200m/min fz=0,4mm/tooth ap=1,5mm ae=0,5D								
Carbon Steels Alloy Steels (30-40 HRC)	100-200	0,2-0,6	2390	960	8,6	1910	760	8,6	1490	890	12,8
			Vc=150m/min fz=0,2mm/tooth ap=1,5mm ae=0,3D								
			2390	1430	21,5	1910	1150	21,6	1490	1340	32,2
			Vc=150m/min fz=0,3mm/tooth ap=1,5mm ae=0,5D								
Carbon Steels Alloy Steels (40-45 HRC)	60-150	0,15-0,3	1590	480	2,9	1270	380	2,9	990	450	4,3
			Vc=100m/min fz=0,15mm/tooth ap=1mm ae=0,3D								
			1590	640	6,4	1270	510	6,4	990	590	9,4
			Vc=100m/min fz=0,2mm/tooth ap=1mm ae=0,5D								
Carbon Steels Alloy Steels (45-50 HRC)	60-100	0,15-0,3	1270	380	2,3	1020	310	2,3	800	360	3,5
			Vc=80m/min fz=0,15mm/tooth ap=1mm ae=0,3D								
			1270	380	3,8	1020	310	3,9	800	360	5,8
			Vc=80m/min fz=0,15mm/tooth ap=1mm ae=0,5D								
Alloy Steels (50-60 HRC)	50-100	0,05-0,2	1110	220	1,3	890	170	1,2	690	200	1,9
			Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,3D								
			1110	220	2,2	890	170	2,1	690	200	3,2
			Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,5D								
Stainless Steels	150-240	0,2-0,8	3180	1590	14,3	2550	1280	14,4	1990	1490	21,5
			Vc=200m/min fz=0,25mm/tooth ap=1,5mm ae=0,3D								
			2860	1716	25,7	2290	1370	25,7	1790	1610	38,6
			Vc=180m/min fz=0,3mm/tooth ap=1,5mm ae=0,5D								
Cast Iron	100-220	0,3-1,0	2860	2290	20,6	2290	1830	20,6	1790	2150	31
			Vc=180m/min fz=0,4mm/tooth ap=1,5mm ae=0,3D								
			2860	2860	42,9	2290	2290	42,9	1790	2690	64,6
			Vc=180m/min fz=0,5mm/tooth ap=1,5mm ae=0,5D								

Material	ø40 - ø42 (R6)			ø50 - ø52 (R6)			ø40 - ø42 (R8)			ø50 - ø52 (R8)		
	min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min
Mild Steels (200 HB)	1990	2990	71,8	1590	3180	95,4	1990	1990	47,8	1590	2390	71,7
	Vc=250m/min fz=0,5mm/tooth ap=2mm ae=0,3D						Vc=250m/min fz=0,5mm/tooth ap=2mm ae=0,3D					
	1990	4780	191,2	1590	5090	254,5	1990	3180	159	1590	3820	238,8
	Vc=250m/min fz=0,8mm/tooth ap=2mm ae=0,5D						Vc=250m/min fz=0,8mm/tooth ap=2,5mm ae=0,5D					
Carbon Steels Alloy Steels (30 HRC)	1590	1910	45,8	1270	2030	60,9	1590	1270	30,5	1270	1520	45,6
	Vc=200m/min fz=0,4mm/tooth ap=2mm ae=0,3D						Vc=200m/min fz=0,4mm/tooth ap=2mm ae=0,3D					
	1590	2860	114,4	1270	3050	152,5	1590	1910	95,5	1270	2290	143,1
	Vc=200m/min fz=0,6mm/tooth ap=2mm ae=0,5D						Vc=200m/min fz=0,6mm/tooth ap=2,5mm ae=0,5D					
Carbon Steels Alloy Steels (30-40 HRC)	1190	710	17	960	770	23,1	1190	480	11,5	960	580	17,4
	Vc=150m/min fz=0,2mm/tooth ap=2mm ae=0,3D						Vc=150m/min fz=0,2mm/tooth ap=2mm ae=0,3D					
	1190	1070	42,8	960	1150	57,5	1190	950	47,5	960	1150	71,9
	Vc=150m/min fz=0,3mm/tooth ap=2mm ae=0,5D						Vc=150m/min fz=0,4mm/tooth ap=2,5mm ae=0,5D					
Carbon Steels Alloy Steels (40-45 HRC)	800	360	6,5	640	380	8,6	800	240	4,3	640	290	6,5
	Vc=100m/min fz=0,15mm/tooth ap=1,5mm ae=0,3D						Vc=100m/min fz=0,15mm/tooth ap=1,5mm ae=0,3D					
	800	480	14,4	640	510	19,1	800	320	12,8	640	380	19
	Vc=100m/min fz=0,2mm/tooth ap=1,5mm ae=0,5D						Vc=100m/min fz=0,2mm/tooth ap=2mm ae=0,5D					
Carbon Steels Alloy Steels (45-50 HRC)	640	290	3,5	510	310	4,7	640	220	4	510	260	5,9
	Vc=80m/min fz=0,15mm/tooth ap=1mm ae=0,3D						Vc=80m/min fz=0,17mm/tooth ap=1,5mm ae=0,3D					
	640	330	6,6	510	350	8,8	640	260	7,8	510	310	11,6
	Vc=80m/min fz=0,17mm/tooth ap=1mm ae=0,5D						Vc=80m/min fz=0,2mm/tooth ap=1,5mm ae=0,5D					
Alloy Steels (50-60 HRC)	550	160	1,9	440	170	2,5	550	110	1,3	440	130	1,9
	Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,3D						Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,3D					
	550	160	3,2	440	170	4,2	550	110	2,2	440	130	3,2
	Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,5D						Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,5D					
Stainless Steels	1590	1430	34,3	1270	1520	45,6	1590	950	22,8	1270	1140	34,2
	Vc=200m/min fz=0,3mm/tooth ap=2mm ae=0,3D						Vc=200m/min fz=0,3mm/tooth ap=2mm ae=0,3D					
	1430	2150	86	1150	2300	115	1430	1720	86	1150	2070	129,4
	Vc=180m/min fz=0,5mm/tooth ap=2mm ae=0,5D						Vc=180m/min fz=0,6mm/tooth ap=2,5mm ae=0,5D					
Cast Iron	1430	2150	51,6	1150	2300	69	1430	1430	34,3	1150	1730	51,9
	Vc=180m/min fz=0,5mm/tooth ap=2mm ae=0,3D						Vc=180m/min fz=0,5mm/tooth ap=2mm ae=0,3D					
	1430	3430	137,2	1150	3680	184	1430	2290	114,5	1150	2760	172,5
	Vc=180m/min fz=0,8mm/tooth ap=2mm ae=0,5D						Vc=180m/min fz=0,8mm/tooth ap=2,5mm ae=0,5D					

Note
-In this table, cutting conditions indicate regular type conditions for frank wear to be 0,3mm in 30 minutes.
-The following formula shows the chip removal volume (Q) per unit time.
Q(cm^3/min) =ap(mm) x ae(mm) x Vf(mm/min) /1000
-In the case of slotting, feed speed could be down to 70% of the whole.
-This table shows starting points of general cutting conditions. Please adjust according to rigidity of machine tools, tooling, conditions of work-pieces and so on.
-In steel exceeding 60HRC, such as dice steel between the colds, please set the sending (fz) value per one edge about 1/2.

Recommended cutting conditions

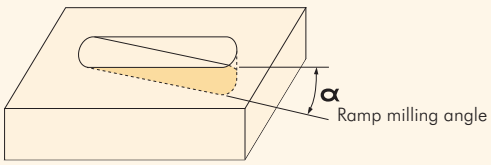
Material	m/min Cutting Speed	mm/tooth Feed rate	⌀63 (R6)			⌀80 (R6)			⌀100 (R6)		
			min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min	min^{-1}	mm/min	cm^3/min
Mild Steels (200 HB)	150-250	0,3-0,8		3780	142,9	-	-	-	-	-	-
			Vc=250m/min fz=0,5mm/tooth ap=2mm ae=0,3D								
			1260	6050	381,2	1000	4800	384	800	3200	320
			Vc=250m/min fz=0,8mm/tooth ap=2mm ae=0,5D								
Carbon Steels Alloy Steels (30 HRC)	120-230	0,3-0,8	1010	2420	91,5	-	-	-	-	-	-
			Vc=200m/min fz=0,4mm/tooth ap=2mm ae=0,3D								
			1010	3640	229,3	800	2880	230,4	640	1920	192
			Vc=200m/min fz=0,6mm/tooth ap=2mm ae=0,5D								
Carbon Steels Alloy Steels (30-40 HRC)	100-200	0,2-0,6	760	910	34,4	-	-	-	-	-	-
			Vc=150m/min fz=0,2mm/tooth ap=2mm ae=0,3D								
			760	1370	86,3	600	1080	86,4	480	720	72
			Vc=150m/min fz=0,3mm/tooth ap=2mm ae=0,5D								
Carbon Steels Alloy Steels (40-45 HRC)	60-150	0,15-0,3	510	460	13	-	-	-	-	-	-
			Vc=100m/min fz=0,15mm/tooth ap=1,5mm ae=0,3D								
			510	610	28,8	400	480	28,8	320	320	24
			Vc=100m/min fz=0,2mm/tooth ap=1,5mm ae=0,5D								
Carbon Steels Alloy Steels (45-50 HRC)	60-100	0,15-0,3	400	360	6,8	-	-	-	-	-	-
			Vc=80m/min fz=0,15mm/tooth ap=1mm ae=0,3D								
			400	410	12,9	320	330	13,2	250	210	10,5
			Vc=80m/min fz=0,17mm/tooth ap=1mm ae=0,5D								
Alloy Steels (50-60 HRC)	50-100	0,05-0,2	350	210	3,9	270	160	3,8	220	110	3,3
			Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,3D								
			350	210	6,6	270	160	6,4	220	110	5,5
			Vc=70m/min fz=0,1mm/tooth ap=1mm ae=0,5D								
Stainless Steels	150-240	0,2-0,8	1010	1820	68,8	-	-	-	-	-	-
			Vc=200m/min fz=0,3mm/tooth ap=2mm ae=0,3D								
			910	2730	172	720	2160	172,8	570	1430	143
			Vc=180m/min fz=0,5mm/tooth ap=2mm ae=0,5D								
Cast Iron	100-220	0,3-1,0	910	2730	103,2	-	-	-	-	-	-
			Vc=180m/min fz=0,5mm/tooth ap=2mm ae=0,3D								
			910	4370	275,3	720	3460	276,8	570	2280	228
			Vc=180m/min fz=0,8mm/tooth ap=2mm ae=0,5D								

Field Data

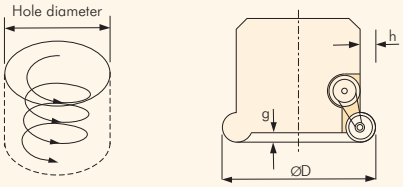
Ramping, Helical Milling, Feeding toward Z-AXIS

There are restrictions to Ramp angle (α) and cutting depth (g) toward Z-axis because of designs of cutting edge.

Ramping



Helical milling

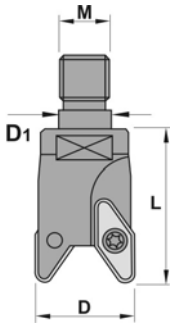


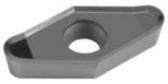
∅D	⌀40	⌀50 ⌀52	⌀63 ⌀66	⌀80	⌀100	⌀125 - ⌀160
Recommended α	Below 3 degrees					Below 2 degrees
h	2,5	2,5	2,5	2,5	2,5	2,5
g	3,7	3,3	5,5	5,5	5,5	5,5
Helical hole diameter	60-78	77-100	101-124	135-158	175-198	248-255

Note
-Chips may be shattered. The wearing of safety glasses and the guard are required in the vicinity of machining.

144

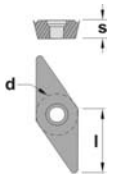
REF.	D	L	M	D1	Z	VC..		
144.015	15	35	M8	8,5	2	1103..	125	507
144.020	20	35	M10	10,5	2	1103..	125	507
144.025	25	50	M12	12,5	2	1604..	140	515
144.032	32	50	M16	17,0	2	2205..	150	520
144.042	42	50	M16	17,0	3	2205..	150	520





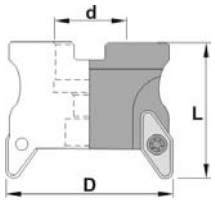
REF.	l	s	d
VC.. 1103..	11,00	3,18	6,35
VC.. 1604..	16,50	4,76	9,52
VC.. 2205..	22,10	5,56	12,70

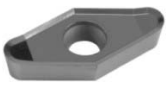
For more information see page: A.55



244

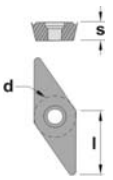
REF.	D	d	L	Z	VC..			
244.042	42	16	55	3	2205..	150	520	108
244.052	52	22	55	3	2205..	150	520	910
244.066	66	27	55	4	2205..	150	520	912
244.080	80	27	55	5	2205..	150	520	912





REF.	l	s	d
VC.. 2205..	22,10	5,56	12,70

For more information see page: A.55



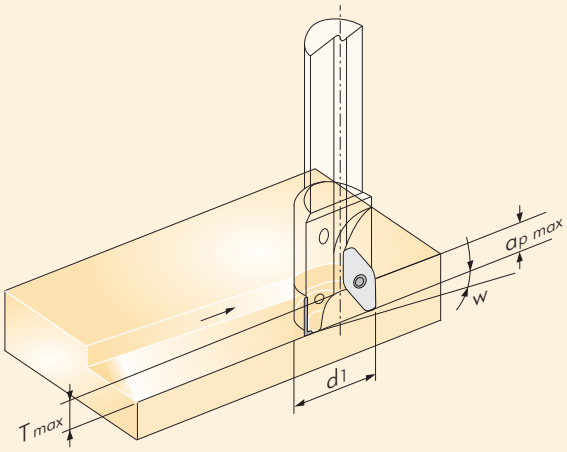
Recommended cutting conditions

Material		Cutting Speed ZR 10 Vc (mm/min)	Cutting Speed KM 15 Vc (mm/min)
Aluminium alloys	Rm < 280 N/mm²	1500	1000
	Rm < 280 N/mm²	1000	800
Copper alloys	Long chipping	300	250
Thermoplastics			300
Aluminium alloys	Si < 12 %	100	800
	Si ≥ 12 %	200	
Copper alloys	Short chipping	500	400
Magnesium alloys			400
Duroplastics		200	150

Maximum feed per tooth f_z (mm/z) in mm		
VCGT 1103..	VCGT 1604..	VCGT 2205..
0,25	0,35	0,5
0,2	0,3	0,4

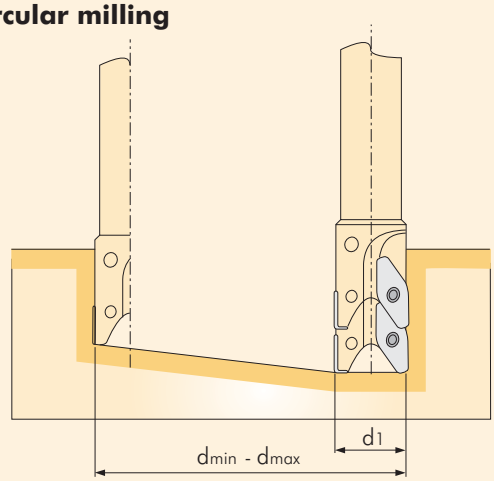
Further application recommendations

Pocket milling and axial plunging



Helix angle W1 max and internal depth of cut Tmax			
	VCGT 110304-ALM	VCGT 160412-ALM	VCGT 220530-ALM
$a_{p\ max}$	10	13,5	15
T_{max}	6	8	9
	$W1_{max}$ in Grad degree		
15			
20	25		
25		24	
32			22
42			15
52			12
66			9
80			7

Circular milling



d1 mm	dmin mm	dmax mm
15	15	15
20	20	20
25	25	25
32	32	32
42	42	42
52	52	52
66	66	66
80	80	80