

Routers



Routing

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Recommandations de vitesse et avance indiquées après chaque série

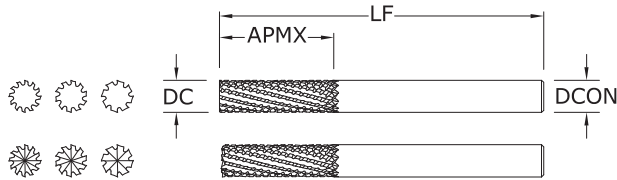
Konturenfräsen

HOCHLEISTUNGS-KONTURENFRÄSER	SERIE	BESCHREIBUNG	SEITE
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Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie



METRIC Carbon Composite



20M-CCR METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,130
DCON = h₆

PLASTICS/COMPOSITES

For patent
information visit
www.ksptpatents.com

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Ti-NAMITE-B (TiB ₂)	DI-NAMITE® (Diamond)
2,0	6,0	38,0	3,0	5	End Cutting	82930	83100	83070
3,0	10,0	38,0	3,0	5	End Cutting	82931	83101	83071
4,0	12,0	50,0	4,0	5	End Cutting	82932	83102	83072
5,0	15,0	50,0	6,0	5	End Cutting	82933	83103	83073
6,0	25,0	63,0	6,0	8	No End Cutting	82966	83104	83027
6,0	25,0	63,0	6,0	8	End Cutting	82967	83105	83026
8,0	25,0	63,0	8,0	10	No End Cutting	82968	83106	83029
8,0	25,0	63,0	8,0	10	End Cutting	82969	83107	83028
10,0	28,0	63,0	10,0	12	No End Cutting	82970	83108	83042
10,0	28,0	63,0	10,0	12	End Cutting	82971	83109	83041
12,0	38,0	89,0	12,0	12	No End Cutting	82972	83110	83044
12,0	38,0	89,0	12,0	12	End Cutting	82973	83111	83043

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

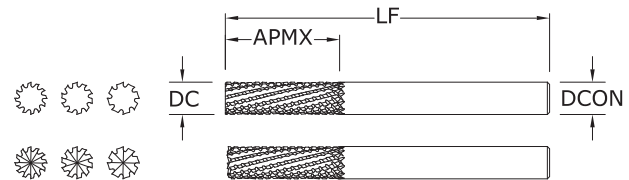
METRIC

Carbon Composite



20M-CCR-LHC

METRIC SERIES



- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	8	No End Cutting	83220	83230
6,0	25,0	63,0	6,0	8	End Cutting	83221	83231
8,0	25,0	63,0	8,0	10	No End Cutting	83222	83232
8,0	25,0	63,0	8,0	10	End Cutting	83223	83233
10,0	28,0	63,0	10,0	12	No End Cutting	83224	83234
10,0	28,0	63,0	10,0	12	End Cutting	83225	83235

TOLERANCES (mm)

DC = +0,000/-0,130

DCON = h₆

PLASTICS/COMPOSITES

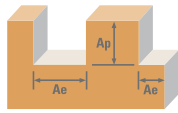
For patent
information visit
www.ksptpatents.com

Carbon Composite

Series

20M

Metric



3

6

8

10

12

DC • mm

Slot



1

≤ 1

120

(96-164)

RPM

12722

6361

4771

3817

3181

Fr

0.055

0.113

0.243

0.366

0.439

Feed (mm/min)

700

720

1160

1395

1395

Profile



≤ 0.5

≤ 1.5

150

(120-180)

RPM

15903

7951

5963

4771

3976

Fr

0.055

0.113

0.243

0.366

0.439

Feed (mm/min)

875

900

1450

1744

1744

HSM



≤ 0.05

≤ 2

250

(200-300)

RPM

26504

13252

9939

7951

6626

Fr

0.126

0.260

0.556

0.833

1.000

Feed (mm/min)

3350

3450

5527

6625

6625

Slot



1

≤ 1

100

(80-120)

RPM

10602

5301

3976

3181

2650

Fr

0.054

0.111

0.236

0.357

0.428

Feed (mm/min)

570

587

940

1135

1135

Profile



≤ 0.5

≤ 1.5

120

(96-164)

RPM

12722

6361

4771

3817

3181

Fr

0.054

0.111

0.236

0.357

0.428

Feed (mm/min)

684

704

1128

1362

1362

HSM



≤ 0.05

≤ 2

200

(160-240)

RPM

21203

10602

7951

6361

5301

Fr

0.124

0.261

0.557

1.011

1.213

Feed (mm/min)

2629

2765

4430

6430

6430

Slot



1

≤ 1

145

(116-174)

RPM

15372

7686

5765

4612

3843

Fr

0.069

0.152

0.323

0.482

0.579

Feed (mm/min)

1061

1165

1860

2224

2224

Profile



≤ 0.5

≤ 1.5

185

(148-222)

RPM

19613

9807

7355

5884

4903

Fr

0.069

0.152

0.323

0.482

0.579

Feed (mm/min)

1353

1486

2373

2838

2838

HSM



≤ 0.05

≤ 2

300

(240-360)

RPM

31805

15903

11927

9542

7951

Fr

0.159

0.348

0.740

1.109

1.331

Feed (mm/min)

5057

5535

8820

10580

10580

Slot



1

≤ 1

245

(196-294)

RPM

25974

12987

9740

7792

6494

Fr

0.069

0.150

0.319

0.477

0.572

Feed (mm/min)

1792

1945

3107

3717

3717

Profile



≤ 0.5

≤ 1.5

305

(244-366)

RPM

32335

16168

12126

9701

8084

Fr

0.069

0.150

0.319

0.477

0.572

Feed (mm/min)

2231

2421

3868

4627

4627

HSM



≤ 0.05

≤ 2

505

(404-606)

RPM

53538

26769

20077

16062

13385

Fr

0.159

0.344

0.732

1.097

1.316

Feed (mm/min)

8513

9220

14690

17617

17617

HSM (high speed machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fr} \times \text{rpm}$

adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

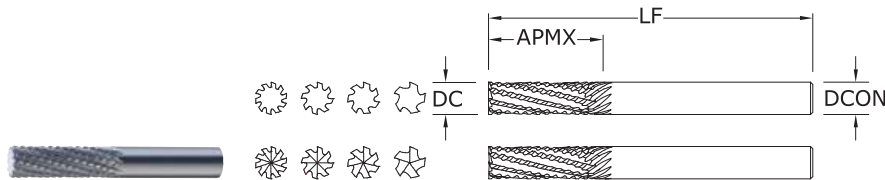
finish cuts typically required reduced feed and cutting depths
 rates shown are for use without coolant; rates may be increased with coolant
 dust collection is vital when machining dry
 diamond coating will increase tool life in graphite and composite materials
 refer to the SGS Tool Wizard® for complete technical information
 (www.kyocera-sgstool.com)

METRIC

Coarse Cut Carbon Composite



31M-CCR METRIC SERIES



- Fewer, deeper flutes to prevent clogging in heavy routing
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	TI-NAMITE-B (TiB ₂)	DI-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	5	End Cutting	82974	83200	82982
6,0	25,0	63,0	6,0	5	No End Cutting	82975	83201	82983
8,0	25,0	63,0	8,0	7	End Cutting	82976	83202	82984
8,0	25,0	63,0	8,0	7	No End Cutting	82977	83203	82985
10,0	28,0	63,0	10,0	8	End Cutting	82978	83204	82986
10,0	28,0	63,0	10,0	8	No End Cutting	82979	83205	82987
12,0	38,0	89,0	12,0	10	End Cutting	82980	83206	82988
12,0	38,0	89,0	12,0	10	No End Cutting	82981	83207	82989

TOLERANCES (mm)

DC = +0,000/-0,130

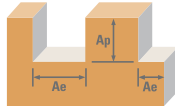
DCON = h₆

PLASTICS/COMPOSITES

For patent information visit
www.ksptpatents.com

Coarse Cut Carbon Composite

Series 31M Metric



Ae x DC

Ap x DC

Vc (m/min)

DC • mm

6

8

10

12

CFRP, AFRP (CARBON FIBER, ARAMID FIBER)

Slot

1

≤ 1

120

(96-164)

RPM

Fr

Feed (mm/min)

6361

0.071

450

4771

0.170

810

3817

0.244

930

3181

0.366

1165

Profile

≤ 0.5

≤ 1.5

150

(120-180)

RPM

Fr

Feed (mm/min)

7951

0.071

563

5963

0.170

1013

4771

0.244

1163

3976

0.366

1456

HSM

≤ 0.05

≤ 2

250

(200-300)

RPM

Fr

Feed (mm/min)

13252

0.162

2150

9939

0.388

3860

7951

0.555

4415

6626

0.832

5515

GFRP (FIBERGLASS)

Slot

1

≤ 1

100

(80-120)

RPM

Fr

Feed (mm/min)

5301

0.069

365

3976

0.165

655

3181

0.237

755

2650

0.357

945

Profile

≤ 0.5

≤ 1.5

120

(96-164)

RPM

Fr

Feed (mm/min)

6361

0.069

438

4771

0.165

786

3817

0.237

906

3181

0.357

1134

HSM

≤ 0.05

≤ 2

200

(160-240)

RPM

Fr

Feed (mm/min)

10602

0.163

1725

7951

0.390

3100

6361

0.557

3540

5301

0.834

4420

CARBON, GRAPHITE

Slot

1

≤ 1

145

(116-174)

RPM

Fr

Feed (mm/min)

7686

0.095

728

5765

0.226

1300

4612

0.321

1480

3843

0.483

1855

Profile

≤ 0.5

≤ 1.5

185

(148-222)

RPM

Fr

Feed (mm/min)

9807

0.095

929

7355

0.226

1659

5884

0.321

1888

4903

0.483

2367

HSM

≤ 0.05

≤ 2

300

(240-360)

RPM

Fr

Feed (mm/min)

15903

0.217

3450

11927

0.517

6170

9542

0.739

7050

7951

1.111

8830

PLASTICS

Slot

1

≤ 1

245

(196-294)

RPM

Fr

Feed (mm/min)

12987

0.094

1215

9740

0.223

2175

7792

0.318

2475

6494

0.477

3100

Profile

≤ 0.5

≤ 1.5

305

(244-366)

RPM

Fr

Feed (mm/min)

16168

0.094

1513

12126

0.223

2708

9701

0.318

3081

8084

0.477

3859

HSM

≤ 0.05

≤ 2

505

(404-606)

RPM

Fr

Feed (mm/min)

26769

0.215

5760

20077

0.512

10280

16062

0.731

11745

13385

1.098

14700

HSM (high speed machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fr} \times \text{rpm}$
 adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

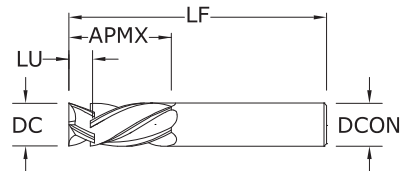
finish cuts typically required reduced feed and cutting depths
 rates shown are for use without coolant; rates may be increased with coolant
 dust collection is vital when machining dry
 diamond coating will increase tool life in graphite and composite materials
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Compression



25M METRIC SERIES

- Compression-style helixes direct cutting forces inward, eliminating fiber breakout and delamination
- Primary/secondary relief grind for reduced friction and pressure
- Rigid, heavy core



mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	INTERSECT LENGTH LU	NO. OF FLUTES	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	4,10	4	82990	82991
8,0	25,0	63,0	8,0	5,58	4	82992	82993
10,0	28,0	63,0	10,0	7,05	6	82994	82995
12,0	38,0	89,0	12,0	8,60	8	82996	82997

TOLERANCES (mm)

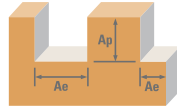
DC = +0,000/-0,080

DCON = h₆

PLASTICS/COMPOSITES

For patent information visit
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Compression



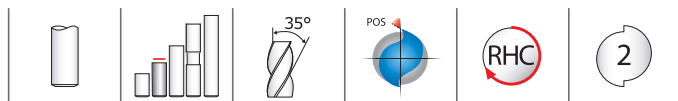
Series 25M Metric				Vc (m/min)	DC • mm			
	Ae x DC	Ap x DC			6	8	10	12
CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Profile ≤ 0.5 ≤ 1.5		150	RPM	7951	5963	4771	3976
			(96-164)	Fz	0.040	0.065	0.075	0.100
				Feed (mm/min)	1272	1550	2147	3181
	HSM ≤ 0.05 ≤ 2		250	RPM	13252	9939	7951	6626
			(200-300)	Fz	0.095	0.145	0.175	0.235
				Feed (mm/min)	5036	5765	8349	12457
GFRP (FIBERGLASS)	Profile ≤ 0.5 ≤ 1.5		120	RPM	6361	4771	3817	3181
			(96-164)	Fz	0.040	0.065	0.075	0.100
				Feed (mm/min)	1018	1240	1717	2544
	HSM ≤ 0.05 ≤ 2		200	RPM	10602	7951	6361	5301
			(160-240)	Fz	0.095	0.145	0.175	0.235
				Feed (mm/min)	4029	4612	6679	9966
N CARBON, GRAPHITE	Profile ≤ 0.5 ≤ 1.5		185	RPM	9807	7355	5884	4903
			(148-222)	Fz	0.050	0.080	0.095	0.125
				Feed (mm/min)	1961	2354	3354	4903
	HSM ≤ 0.05 ≤ 2		300	RPM	15903	11927	9542	7951
			(240-360)	Fz	0.115	0.185	0.220	0.290
				Feed (mm/min)	7315	8826	12595	18447
PLASTICS	Profile ≤ 0.5 ≤ 1.5		305	RPM	16168	12126	9701	8084
			(244-366)	Fz	0.050	0.080	0.095	0.125
				Feed (mm/min)	3234	3880	5529	8084
	HSM ≤ 0.05 ≤ 2		505	RPM	26769	20077	16062	13385
			(404-606)	Fz	0.115	0.185	0.220	0.290
				Feed (mm/min)	12314	14857	21201	31052
MACHINABLE CERAMICS MACHINABLE GLASS	Profile ≤ 0.5 ≤ 1.5		15	RPM	795	596	477	398
			(12-18)	Fz	0.020	0.035	0.045	0.050
				Feed (mm/min)	64	83	129	159
	HSM ≤ 0.05 ≤ 2		25	RPM	1325	994	795	663
			(20-30)	Fz	0.045	0.075	0.085	0.115
				Feed (mm/min)	239	298	406	610

HSM (high speed machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times \text{number of flutes} \times \text{rpm}$
 adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths
 rates shown are for use without coolant; rates may be increased with coolant
 dust collection is vital when machining dry
 diamond coating will increase tool life in graphite and composite materials
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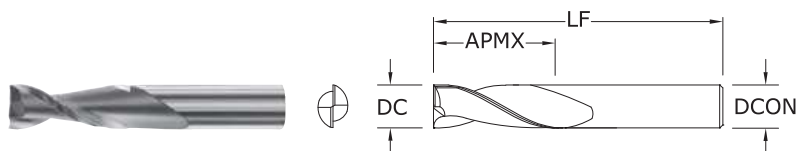
METRIC

Up Cut



21M

METRIC SERIES



mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	90101
4,0	16,0	63,0	6,0	90107
5,0	19,0	63,0	6,0	90109
6,0	25,0	63,0	6,0	90113
8,0	25,0	63,0	8,0	90121
10,0	31,0	75,0	10,0	90129
12,0	31,0	75,0	12,0	90137

TOLERANCES (mm)

DC = +0,000/-0,080

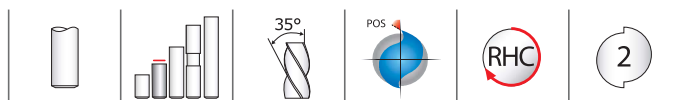
DCON = h₆

PLASTICS/COMPOSITES

For patent
information visit
www.ksptpatents.com

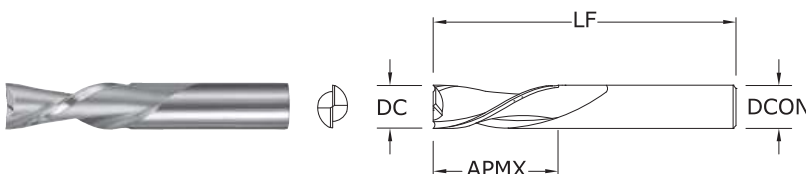
METRIC

Down Cut



22M

METRIC SERIES



mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	91101
4,0	16,0	63,0	6,0	91107
5,0	19,0	63,0	6,0	91109
6,0	25,0	63,0	6,0	91113
8,0	25,0	63,0	8,0	91121
10,0	31,0	75,0	10,0	91129
12,0	31,0	75,0	12,0	91137

TOLERANCES (mm)

DC = +0,000/-0,080

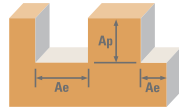
DCON = h₆

PLASTICS/COMPOSITES

For patent
information visit
www.ksptpatents.com

METRIC

Up Cut Down Cut



Series 21M, 22M Metric				Vc (m/min)		DC • mm					
		3	6			10	12	20			
HARDWOODS		1	≤ 1	470	RPM	49828	24914	14948	12457	7474	
				(376-564)	Fz	0.020	0.040	0.065	0.075	0.115	
				Feed (mm/min)	1993	1993	1943	1869	1719		
		≤ 0.5	≤ 1.5	470	RPM	49828	24914	8155	4241	1509	
				(376-564)	Fz	0.020	0.040	0.065	0.075	0.115	
				Feed (mm/min)	1993	1993	1060	636	347		
	SOFTWOODS		1	≤ 1	600	RPM	63610	31805	19083	15903	9542
					(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
					Feed (mm/min)	3181	3181	2862	2862	2672	
			≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467
					(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
					Feed (mm/min)	3181	3181	2862	2862	84971	
PLYWOODS		1	≤ 1	600	RPM	63610	31805	19083	15903	9542	
				(480-720)	Fz	0.030	0.065	0.100	0.125	0.190	
				Feed (mm/min)	3817	4135	3817	3976	3626		
		≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467	
				(480-720)	Fz	0.030	0.065	0.100	0.125	0.190	
				Feed (mm/min)	3817	4135	3817	3976	115318		
N PLASTICS		1	≤ 1	600	RPM	63610	31805	19083	15903	9542	
				(480-720)	Fz	0.020	0.040	0.065	0.090	0.125	
				Feed (mm/min)	2544	2544	2481	2862	2385		
		≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	9542	
				(480-720)	Fz	0.020	0.040	0.065	0.090	0.125	
				Feed (mm/min)	2544	2544	2481	2862	2385		

rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm