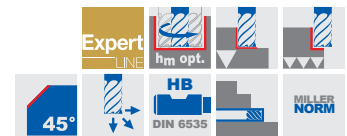
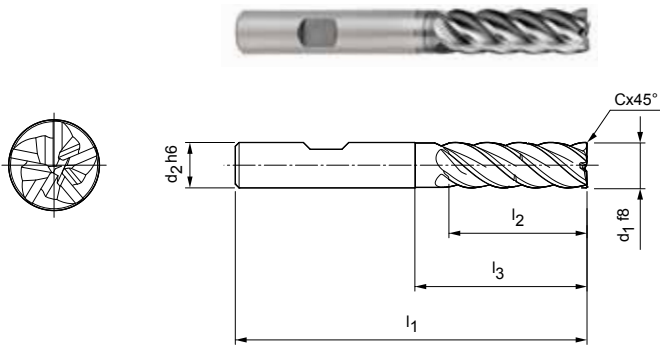


OptiMill® -Tro-Uni

3xD design with neck
M3099



Design:
 Milling cutter diameter: 4,00-25,00 mm
 Coating: MF3
 Number of cutting edges: z = 5
 Helix angle: 41°-42°
 Balancing quality: Cutting edge portion balanced to G2.5 in acc. with DIN ISO 1940-G2.5
 Special features: Unequal spacing

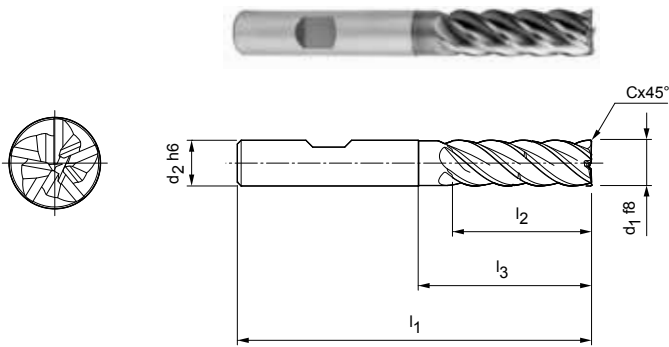
Application:
 Especially for trochoidal milling – part-contact cutting/trimming. For cutting depths up to 3xD with special chip breaker for optimum chip control.

Dimensions						z	Specification	Order No.
d ₁ f8	d ₂ h6	l ₁	l ₂	l ₃	C x 45°			
4,00	6	62	16	23	0,08	5	M3099-0400BY-C0008	30547814
5,00	6	62	17	24	0,10	5	M3099-0500BY-C0010	30547815
6,00	6	62	18	25	0,12	5	M3099-0600BY-C0012	30547816
8,00	8	68	24	30	0,16	5	M3099-0800BY-C0016	30547818
10,00	10	80	30	35	0,20	5	M3099-1000BY-C0020	30547819
12,00	12	93	36	45	0,24	5	M3099-1200BY-C0024	30547820
14,00	14	99	42	50	0,28	5	M3099-1400BY-C0028	30547821
16,00	16	108	48	55	0,32	5	M3099-1600BY-C0032	30547822
18,00	18	117	54	67	0,36	5	M3099-1800BY-C0036	30547823
20,00	20	126	60	70	0,40	5	M3099-2000BY-C0040	30547825
25,00	25	150	75	92	0,50	5	M3099-2500BY-C0050	30547834

Dimensions in mm.
 Cutting data recommendation from page 118.
 Special designs and other coatings on request.

OptiMill[®]-Tro-PM

3xD design with neck
M3299



Design:

Milling cutter diameter: 4,00-25,00 mm
Coating: MF2
Number of cutting edges: z = 5
Helix angle: 41°-42°
Balancing quality: Cutting edge portion balanced to G2.5 in acc. with DIN ISO 1940-G2.5
Special features: Unequal spacing

Application:

Especially for trochoidal milling – part-contact cutting/trimming. For cutting depths up to 3xD with special chip breaker for optimum chip control.



Dimensions						z	Specification	Order No.
d ₁ f8	d ₂ h6	l ₁	l ₂	l ₃	C x 45°			
4,00	6	62	16	23	0,08	5	M3299-0400BL-C0008	30543767
5,00	6	62	17	24	0,10	5	M3299-0500BL-C0010	30543765
6,00	6	62	18	25	0,12	5	M3299-0600BL-C0012	30524804
8,00	8	68	24	30	0,16	5	M3299-0800BL-C0016	30524805
10,00	10	80	30	35	0,20	5	M3299-1000BL-C0020	30524806
12,00	12	93	36	45	0,24	5	M3299-1200BL-C0024	30524807
14,00	14	99	42	50	0,28	5	M3299-1400BL-C0028	30524808
16,00	16	108	48	55	0,32	5	M3299-1600BL-C0032	30524809
18,00	18	117	54	67	0,36	5	M3299-1800BL-C0036	30566345
20,00	20	126	60	70	0,40	5	M3299-2000BL-C0040	30524810
25,00	25	150	75	92	0,50	5	M3299-2500BL-C0050	30566346

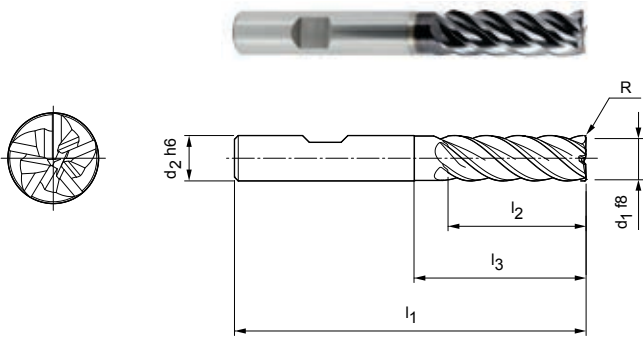
Dimensions in mm.

Cutting data recommendation from page 118.

Special designs and other coatings on request.

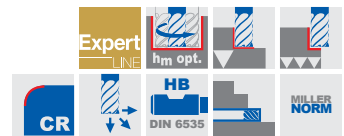
OptiMill®-Tro-S

3xD design with neck
M3699



Design:
 Milling cutter diameter: 5,00-25,00 mm
 Coating: MF5
 Number of cutting edges: z = 5
 Helix angle: 41°-42°
 Balancing quality: Cutting edge portion balanced to G2.5 in acc. with DIN ISO 1940-G2.5
 Special features: Unequal spacing

Application:
 Especially for trochoidal milling – part-contact cutting/trimming. For cutting depths up to 3xD.

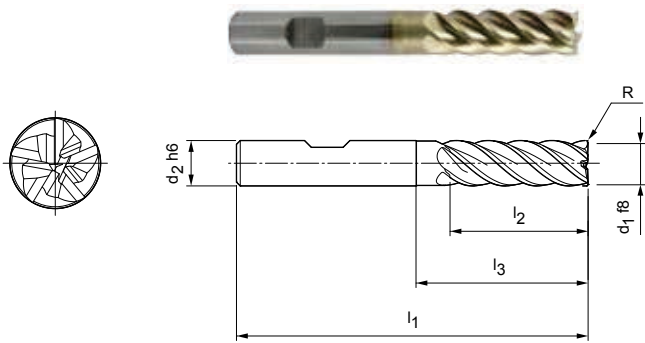


Dimensions						z	Specification	Order No.
d ₁ f8	d ₂ h6	l ₁	l ₂	l ₃	R			
5,00	6	62	17	24	0,10	5	M3699-0500BI-R0010	30543756
6,00	6	62	18	25	0,10	5	M3699-0600BI-R0010	30524811
8,00	8	68	24	30	0,20	5	M3699-0800BI-R0020	30524812
10,00	10	80	30	35	0,20	5	M3699-1000BI-R0020	30524813
12,00	12	93	36	45	0,30	5	M3699-1200BI-R0030	30524814
14,00	14	99	42	50	0,30	5	M3699-1400BI-R0030	30524815
16,00	16	108	48	55	0,30	5	M3699-1600BI-R0030	30524816
18,00	18	117	54	67	0,30	5	M3699-1800BI-R0030	30566343
20,00	20	126	60	70	0,30	5	M3699-2000BI-R0030	30524817
25,00	25	150	75	92	0,40	5	M3699-2500BI-R0040	30566344

Dimensions in mm.
 Cutting data recommendation from page 118.
 Special designs and other coatings on request.

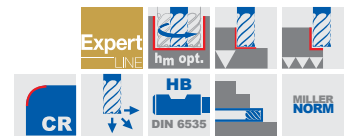
OptiMill® -Tro-Titan

3xD design with neck
M3799



Design:
 Milling cutter diameter: 5,00-25,00 mm
 Coating: MxB
 Number of cutting edges: z = 5
 Helix angle: 41°-42°
 Balancing quality: Cutting edge portion balanced to G2.5 in acc. with DIN ISO 1940-G2.5
 Special features: Unequal spacing

Application:
 Especially for trochoidal milling – part-contact cutting/trimming. For cutting depths up to 3xD.

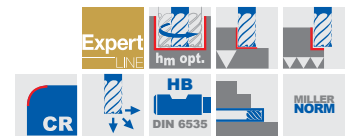
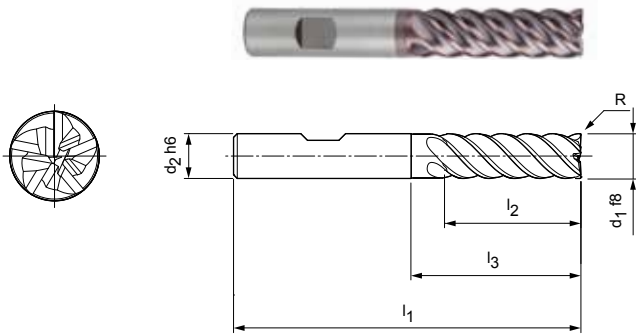


Dimensions						z	Specification	Order No.
d ₁ f8	d ₂ h6	l ₁	l ₂	l ₃	R			
5,00	6	62	17	24	0,10	5	M3799-0500BJ-R0010	30651018
6,00	6	62	18	25	0,10	5	M3799-0600BJ-R0010	30651019
8,00	8	68	24	30	0,20	5	M3799-0800BJ-R0020	30651020
10,00	10	80	30	35	0,20	5	M3799-1000BJ-R0020	30651021
12,00	12	93	36	45	0,30	5	M3799-1200BJ-R0030	30651022
14,00	14	99	42	50	0,30	5	M3799-1400BJ-R0030	30651023
16,00	16	108	48	55	0,30	5	M3799-1600BJ-R0030	30651024
18,00	18	117	54	67	0,30	5	M3799-1800BJ-R0030	30651025
20,00	20	126	60	70	0,30	5	M3799-2000BJ-R0030	30651026
25,00	25	150	75	92	0,40	5	M3799-2500BJ-R0040	30651027

Dimensions in mm.
 Cutting data recommendation from page 118.
 Special designs and other coatings on request.

OptiMill®-Tro-H

3xD design with neck
M3079



Design:
 Milling cutter diameter: 5,00-25,00 mm
 Coating: MxS
 Number of cutting edges: z = 5
 Helix angle: 41°-42°
 Balancing quality: Cutting edge portion balanced to G2.5 in acc. with DIN ISO 1940-G2.5
 Special features: Unequal spacing

Application:
 Especially for trochoidal milling – part-contact cutting/trimming. For cutting depths up to 3xD.

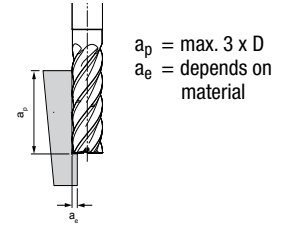
Dimensions						z	Specification	Order No.
d ₁ f8	d ₂ h6	l ₁	l ₂	l ₃	R			
5,00	6	62	17	24	0,10	5	M3079-0500BS-R0010	30580124
6,00	6	62	18	25	0,10	5	M3079-0600BS-R0010	30580125
8,00	8	68	24	30	0,20	5	M3079-0800BS-R0020	30580127
10,00	10	80	30	35	0,20	5	M3079-1000BS-R0020	30580128
12,00	12	93	36	45	0,30	5	M3079-1200BS-R0030	30580129
14,00	14	99	42	50	0,30	5	M3079-1400BS-R0030	30580130
16,00	16	108	48	55	0,30	5	M3079-1600BS-R0030	30580132
18,00	18	117	54	67	0,30	5	M3079-1800BS-R0030	30580133
20,00	20	126	60	70	0,30	5	M3079-2000BS-R0030	30580135
25,00	25	150	75	92	0,40	5	M3079-2500BS-R0040	30580136

Dimensions in mm.
 Cutting data recommendation from page 118.
 Special designs and other coatings on request.

Cutting data recommendation for trochoidal milling cutters

Feed and cutting speed

Trochoidal milling



OptiMill-Tro-Uni | M3099
OptiMill-Tro-PM | M3299

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Cooling			v _c [m/min]	f _z [mm/tooth] in % from D	a _e [mm] in % from D	h _m [mm] in % from D		
			MQL/air	Dry	Wet						
P	P1.1	Structural, free-cutting, case hardened and heat-treated steel, non-alloyed	< 700	✓	✓	✓	380-520	2,0-2,6	14-18	0,66-0,8	
	P1.2	Structural, free-cutting, case hardened and heat-treated steel, non-alloyed	< 1200	✓	✓	✓	320-460	1,8-2,4	12-16	0,62-0,76	
	P2.1	Nitrated, case hardened and heat-treated steel, alloyed	< 900	✓	✓	✓	340-480	1,8-2,4	10-14	0,58-0,71	
	P2.2	Nitrated, case hardened and heat-treated steel, alloyed	< 1400	✓	✓	✓	280-380	1,4-2,0	8-12	0,56-0,68	
	P3.1	Tool, roller bearing, spring and high speed steel	< 900	✓	✓	✓	240-350	1,5-2,2	8-14	0,54-0,65	
	P3.2	Tool, roller bearing, spring and high speed steel	< 1500	✓	✓	✓	210-320	1,2-1,9	6-12	0,52-0,62	
	P4	P4.1	Stainless steel, ferritic and martensitic		✓	✓		1,0-1,8	6-12	0,5-0,6	
	P5	P5.1	Cast steel				220-300	1,4-2,0	8-12	0,54-0,62	
P6	P6.1	Stainless cast steel, ferritic and martensitic			✓	160-240	0,8-1,6	6-12	0,5-0,6		
M	M1.1	Stainless steel, austenitic	< 700	✓		✓	140-220	0,6-1,0	5-10	0,48-0,6	
	M1.2	Stainless steel, ferritic/austenitic (Duplex)	< 1000			✓	110-180	0,6-1,0	5-10	0,46-0,58	
	M2	M2.1	Stainless cast steel, austenitic	< 700	✓		✓	130-200	0,8-1,2	6-12	0,52-0,6
	M3	M3.1	Stainless cast steel, ferritic/austenitic (Duplex)	< 1000			✓	120-180	0,8-1,2	5-10	0,46-0,56
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), EN-GJL	< 300	✓	✓	✓	400-500	2,0-2,6	15-20	0,64-0,78
	K2	K2.1	Cast iron with spheroidal graphite, EN-GJS	< 500	✓	✓	✓	340-500	1,8-2,4	12-16	0,62-0,7
	K2.2	Cast iron with spheroidal graphite, EN-GJS	500-800	✓	✓	✓	300-440	1,6-2,2	10-14	0,58-0,68	
	K2.3	Cast iron with spheroidal graphite, EN-GJS	> 800	✓	✓	✓	180-260	1,4-2,0	8-12	0,56-0,68	
	K3	K3.1	Cast iron with vermicular graphite, EN-GJV; Malleable cast iron, GJM	< 500	✓	✓	✓	280-360	1,6-2,2	10-16	0,6-0,68
	K3.2	Cast iron with vermicular graphite, EN-GJV; Malleable cast iron, GJM	> 500	✓	✓	✓	210-340	1,4-2,0	10-16	0,58-0,66	

OptiMill-Tro-S | M3699, OptiMill-Tro-Titan | M3799

M	M1	M1.1	Stainless steel, austenitic	< 700	✓		✓	140-220	0,6-1,0	5-10	0,48-0,6
	M1.2	Stainless steel, ferritic/austenitic (Duplex)	< 1000			✓	110-180	0,6-1,0	5-10	0,46-0,58	
	M2	M2.1	Stainless cast steel, austenitic	< 700	✓		✓	130-200	0,8-1,2	6-12	0,52-0,6
	M3	M3.1	Stainless cast steel, ferritic/austenitic (Duplex)	< 1000			✓	120-180	0,8-1,2	5-10	0,46-0,56
S	S1	S1.1	Titanium, titanium alloy	< 400			✓	110-170	0,65-1,3	6-12	0,52-0,6
	S2	S2.1	Titanium, titanium alloy	< 1200			✓	90-150	0,6-1,2	5-10	0,46-0,56
	S2.2	Titanium, titanium alloy	> 1200			✓	70-130	0,4-1,0	5-10	0,42-0,54	
	S3	S3.1	Nickel, non-alloyed and alloyed	< 900			✓	60-120	0,4-1,0	5-10	0,4-0,52
	S3.2	Nickel, non-alloyed and alloyed	> 900			✓	50-100	0,3-0,9	5-10	0,4-0,52	
	S4	S4.1	Heat resistant super alloys, Ni, Co, and Fe based				✓	35-90	0,3-0,8	4-8	0,38-0,46
	S5	S5.1	Tungsten and molybdenum alloys				✓	35-90	0,3-0,8	4-8	0,38-0,46

OptiMill-Tro-H | M3079

H	H1	H1.1	Hardened steel/cast steel	45-55	✓	✓	✓	80-140	0,45-0,65	7-12	0,42-0,52
	H1.2	Hardened steel/cast steel	55-64	✓	✓	✓	60-120	0,4-0,52	6-12	0,4-0,5	
	H1.3	Hardened steel/cast steel	64-70	✓	✓		50-100	0,3-0,5	5-10	0,38-0,46	
	H2	H2.1	Wear resistant castings/chilled cast iron, GJN		✓		✓	60-120	0,35-0,55	6-12	0,4-0,48

Note:
With trochoidal milling, the cutting conditions indicated change during the machining process. This is also dependent on the CAM software used and the machining position of the tool in the work-piece. Feed rate and contact width or contact angle change constantly during the machining process in order to achieve the most constant average chip thickness possible, depending on the contour.

* MILLER machining groups