NEW

No compromise on ISO-S materials

The durable MonsterMill – ISO-S machines the most challenging materials

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MonsterMill – ISO-S

The unbeatable solution for machining nickel-based alloys and titanium

When machining materials like nickel-based or titanium alloys, the limits of efficient manufacturing can often be reached more quickly than might be preferred. In order to deal with this and remain successful in the top tier of machining, we have reimagined the MonsterMill – ISO-S series of milling cutters. The perfectly balanced combination of carbide, coating and geometry provides sturdy tools that deliver smooth cutting action every time. Alongside our proven 4- and 5-edge cutters, the line-up now includes the perfect finisher: the new 6-edge MonsterMill – ISO-S.
A new trochoidal milling cutter is also available to further optimise efficiency and process security when machining ISO-S materials. The trochoidal milling strategy creates a more even load distribution and minimises thermal loads, which improves the tool life.

No compromise when machining ISO-S materials

The machining of titanium, Inconel, Hastelloy, Waspaloy and other nickel-based alloys is significantly more demanding than conventional materials and relentlessly drives up machining costs. The high tensile strength of the material, combined with its extreme hardness rapidly accelerates tool wear.

Our solution

Only tools designed specifically for these materials – like the **MonsterMill – ISO-S** – can minimise wear, maximise tool life and guarantee reliable processes.

Optimal cutting edge geometry and performance coating to counteract vibrations and heat

Special cutting edge preparation
+ Long-term stabilisation for the cutting edge
+ Prevents premature fractures

Cutting edges with irregular pitch & variable helix angle
+ Reduces vibrations
+ Increases machining performance and surface quality on the workpiece

Linear clearance angle & polish grinding in the chip space
+ Optimal chip evacuation
+ For maximum process security

DPX22S Dragonskin coating
+ High thermal stability
+ Extremely high wear resistance due to the special layer structure

„We adapted the geometry of the new milling cutters to keep the heat generated in the machining process as low as possible. The polished chip flutes and optimised coating minimise friction and ensure an efficient chip flow, resulting in a longer tool life and maximum process security.“

Michael Wucher, Global Product Manager, Solid Carbide Milling Tools

MonsterMill – ISO-S

Vast tool portfolio perfect for the aerospace sector

End mill with 4 cutting edges

- Two length options
- Diameter range 3-20 mm
- Shank types HA and HB
- Corner radius of RE 0.2-5 mm

End mill with 5 cutting edges

- Diameter range 3-16 mm
- Shank types HA and HB
- Wide range of corner radii

Finish milling cutter with 6-8 cutting edges

- Diameter range 6-16 mm
- Shank type HA
- Corner radius of 0.2-2 mm

Trochoidal milling cutter with 6 cutting edges

- Diameter range 10-20 mm
- Shank type HB
- Cutting edge length 3xDC
- Corner radius of 0.2-2 mm

This range covers the most common dimensions in the aerospace industry and even custom sizes can be provided on request.

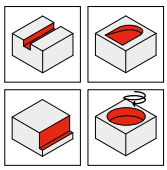
Our experts promise:
We will soon see some practical additions to the series, which will further enhance the versatility of the ISO-S specialists.

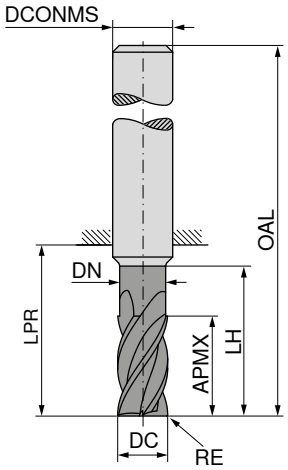
Durable – process-secure – stable

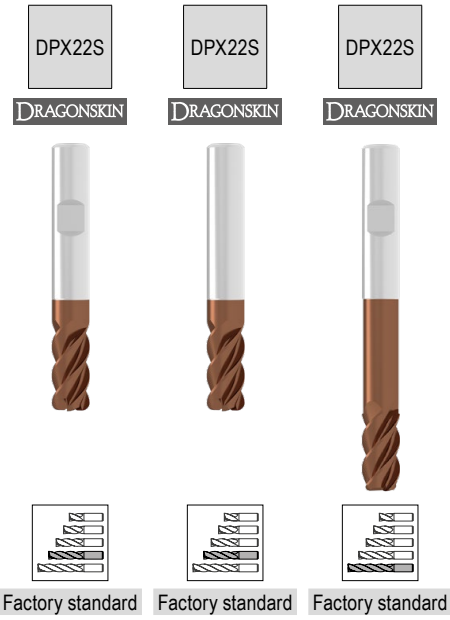
- Specifically designed for machining nickel-based alloys and titanium
- Polished chip flutes ensure excellent chip evacuation
- Smooth-cutting edge design generates less heat during the machining process
- Maximum stability of the cutting edge and core geometry
- Carefully chosen combination of carbide and coating guarantee minimal tool wear
- The latest DRAGONSKIN coating technology developed for demanding ISO-S materials
- Tool design ideal for regrinding
- Extremely vast tool range to choose from

MonsterMill – End milling cutter with corner radius

ISO-S | λ_s=35° γ_s=38° γ_s=13° | HPC







DC h10 mm	RE ±0.05 mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	53 034 ...	53 035 ...	53 036 ...
3,0	0,2	8,0	2,8	13	21	57	6	4	03002	03002	
3,0	0,5	8,0	2,8	13	21	57	6	4	03005	03005	
4,0	0,1	11,0	3,8	17	21	57	6	4	04001	04001	
4,0	0,2	11,0	3,8	17	21	57	6	4	04002	04002	
4,0	0,4	11,0	3,8	17	21	57	6	4	04004	04004	
4,0	0,5	11,0	3,8	17	21	57	6	4	04005	04005	
4,0	0,1	8,5	3,8	20	26	62	6	4			04001
4,0	0,2	8,5	3,8	20	26	62	6	4			04002
4,0	0,5	8,5	3,8	20	26	62	6	4			04005
5,0	0,1	13,0	4,8	19	21	57	6	4	05001	05001	
5,0	0,2	13,0	4,8	19	21	57	6	4	05002	05002	
5,0	0,5	13,0	4,8	19	21	57	6	4	05005	05005	
5,0	1,0	13,0	4,8	19	21	57	6	4	05010	05010	
5,0	0,1	10,5	4,8	25	34	70	6	4			05001
5,0	1,0	10,5	4,8	25	34	70	6	4			05010
6,0	0,1	13,0	5,8	19	21	57	6	4	06001	06001	
6,0	0,2	13,0	5,8	19	21	57	6	4	06002	06002	
6,0	0,4	13,0	5,8	19	21	57	6	4	06004	06004	
6,0	0,5	13,0	5,8	19	21	57	6	4	06005	06005	
6,0	0,8	13,0	5,8	19	21	57	6	4	06008	06008	
6,0	1,0	13,0	5,8	19	21	57	6	4	06010	06010	
6,0	1,5	13,0	5,8	19	21	57	6	4	06015	06015	
6,0	0,1	13,0	5,8	30	34	70	6	4			06001
6,0	0,5	13,0	5,8	30	34	70	6	4			06005
6,0	1,0	13,0	5,8	30	34	70	6	4			06010
6,0	1,5	13,0	5,8	30	34	70	6	4			06015
8,0	0,2	21,0	7,7	25	27	63	8	4	08002	08002	
8,0	0,5	21,0	7,7	25	27	63	8	4	08005	08005	
8,0	0,8	21,0	7,7	25	27	63	8	4	08008	08008	
8,0	1,0	21,0	7,7	25	27	63	8	4	08010	08010	
8,0	1,5	21,0	7,7	25	27	63	8	4	08015	08015	
8,0	2,0	21,0	7,7	25	27	63	8	4	08020	08020	
8,0	0,2	17,0	7,7	40	44	80	8	4			08002
8,0	0,5	17,0	7,7	40	44	80	8	4			08005
8,0	1,0	17,0	7,7	40	44	80	8	4			08010
8,0	1,5	17,0	7,7	40	44	80	8	4			08015
8,0	2,0	17,0	9,7	40	44	80	8	4			08020
10,0	0,2	22,0	9,7	30	32	72	10	4	10002	10002	
10,0	0,5	22,0	9,7	30	32	72	10	4	10005	10005	
10,0	1,0	22,0	9,7	30	32	72	10	4	10010	10010	
10,0	1,5	22,0	9,7	30	32	72	10	4	10015	10015	
10,0	2,0	22,0	9,7	30	32	72	10	4	10020	10020	

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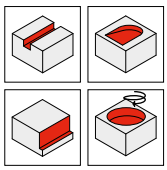
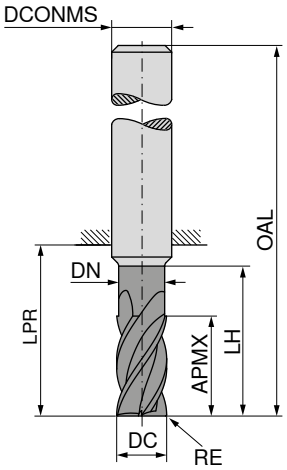
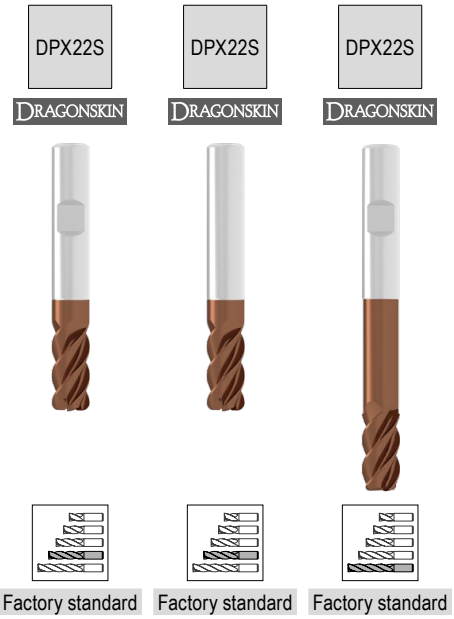
MonsterMill – End milling cutter with corner radius

ISO-S | λ_s=35° γ_s=38° γ_s=13° | HPC







DC h10 mm	RE ±0,05 mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	53 034 ...	53 035 ...	53 036 ...
10,0	0,2	21,0	9,7	50	54	94	10	4			**10002**
10,0	0,5	21,0	9,7	50	54	94	10	4			**10005**
10,0	1,0	21,0	9,7	50	54	94	10	4			**10010**
10,0	1,2	21,0	9,7	50	54	94	10	4			**10012**
10,0	1,5	21,0	9,7	50	54	94	10	4			**10015**
10,0	2,0	21,0	9,7	50	54	94	10	4			**10020**
12,0	0,2	26,0	11,6	36	38	83	12	4	**12002**	**12002**	
12,0	0,5	26,0	11,6	36	38	83	12	4	**12005**	**12005**	
12,0	1,0	26,0	11,6	36	38	83	12	4	**12010**	**12010**	
12,0	1,2	26,0	11,6	36	38	83	12	4	**12012**	**12012**	
12,0	1,5	26,0	11,6	36	38	83	12	4	**12015**	**12015**	
12,0	2,0	26,0	11,6	36	38	83	12	4	**12020**	**12020**	
12,0	2,5	26,0	11,6	36	38	83	12	4	**12025**	**12025**	
12,0	3,0	26,0	11,6	36	38	83	12	4	**12030**	**12030**	
12,0	0,2	25,0	11,6	60	65	110	12	4			**12002**
12,0	0,5	25,0	11,6	60	65	110	12	4			**12005**
12,0	1,0	25,0	11,6	60	65	110	12	4			**12010**
12,0	1,5	25,0	11,6	60	65	110	12	4			**12015**
12,0	2,0	25,0	11,6	60	65	110	12	4			**12020**
12,0	2,5	25,0	11,6	60	65	110	12	4			**12025**
12,0	3,0	25,0	11,6	60	65	110	12	4			**12030**
16,0	0,3	36,0	15,5	42	44	92	16	4	**16003**		
16,0	1,0	36,0	15,5	42	44	92	16	4	**16010**		
16,0	1,5	36,0	15,5	42	44	92	16	4	**16015**		
16,0	2,0	36,0	15,5	42	44	92	16	4	**16020**		
16,0	2,5	36,0	15,5	42	44	92	16	4	**16025**		
16,0	3,0	36,0	15,5	42	44	92	16	4	**16030**		
16,0	4,0	36,0	15,5	42	44	92	16	4	**16040**		
16,0	0,3	33,0	15,5	80	84	132	16	4			**16003**
16,0	1,0	33,0	15,5	80	84	132	16	4			**16010**
20,0	0,3	41,0	19,5	52	54	104	20	4	**20003**		
20,0	1,0	41,0	19,5	52	54	104	20	4	**20010**		
20,0	2,0	41,0	19,5	52	54	104	20	4	**20020**		
20,0	3,0	41,0	19,5	52	54	104	20	4	**20030**		
20,0	4,0	41,0	19,5	52	54	104	20	4	**20040**		
20,0	5,0	41,0	19,5	52	54	104	20	4	**20050**		
20,0	0,3	41,0	19,5	100	104	154	20	4			**20003**
20,0	1,0	41,0	19,5	100	104	154	20	4			**20010**

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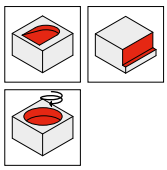
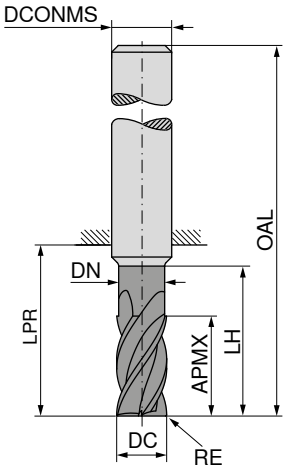
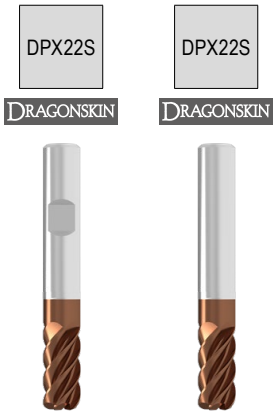
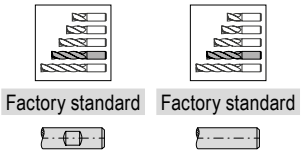
MonsterMill – End milling cutter with corner radius

ISO-S | λ_s=38° γ_s= 7° | HPC









DC h10 mm	RE ±0,05 mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	53 037 ...	53 038 ...
3	0,2	8	2,8	13	21	57	6	5	03002	03002
4	0,2	11	3,8	17	21	57	6	5	04002	04002
5	0,2	13	4,8	19	21	57	6	5	05002	05002
6	0,1	13	5,8	19	21	57	6	5	06001	06001
6	0,5	13	5,8	19	21	57	6	5	06005	06005
6	1,0	13	5,8	19	21	57	6	5	06010	06010
8	0,2	21	7,7	25	27	63	8	5	08002	08002
8	0,5	21	7,7	25	27	63	8	5	08005	08005
8	0,8	21	7,7	25	27	63	8	5	08008	08008
8	1,0	21	7,7	25	27	63	8	5	08010	08010
8	1,5	21	7,7	25	27	63	8	5	08015	08015
8	2,0	21	7,7	25	27	63	8	5	08020	08020
10	0,2	22	9,7	30	32	72	10	5	10002	10002
10	0,5	22	9,7	30	32	72	10	5	10005	10005
10	1,0	22	9,7	30	32	72	10	5	10010	10010
10	1,5	22	9,7	30	32	72	10	5	10015	10015
10	2,0	22	9,7	30	32	72	10	5	10020	10020
12	0,2	26	11,6	36	38	83	12	5	12002	12002
12	0,5	26	11,6	36	38	83	12	5	12005	12005
12	1,0	26	11,6	36	38	83	12	5	12010	12010
12	1,2	26	11,6	36	38	83	12	5	12012	12012
12	1,5	26	11,6	36	38	83	12	5	12015	12015
12	2,0	26	11,6	36	38	83	12	5	12020	12020
12	2,5	26	11,6	36	38	83	12	5	12025	12025
12	3,0	26	11,6	36	38	83	12	5	12030	12030
16	0,3	36	15,5	42	44	92	16	5	16003	16003
16	1,0	36	15,5	42	44	92	16	5	16010	16010
16	2,5	36	15,5	42	44	92	16	5	16025	16025
16	3,0	36	15,5	42	44	92	16	5	16030	16030

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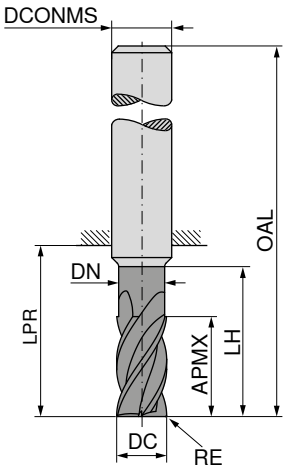
→ v_c/f_z Page 18

MonsterMill – Finish milling cutter with corner radius

▲ Cutting depth: 3 x DC

ISO-S | λ_s=48° γ_s=49° γ_s=13° | HPC



DPX22S

DRAGONSKIN

Factory standard

53 039 ...

DC $_{h10}$ mm	RE $_{\pm 0,05}$ mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS $_{h6}$ mm	ZEFP	
6	0,2	19	5,8	25	27	63	6	6	**06002**
6	0,5	19	5,8	25	27	63	6	6	**06005**
6	1,0	19	5,8	25	27	63	6	6	**06010**
8	0,2	25	7,8	33	35	71	8	6	**08002**
8	0,5	25	7,8	33	35	71	8	6	**08005**
8	1,0	25	7,8	33	35	71	8	6	**08010**
10	0,2	31	9,8	41	43	83	10	6	**10002**
10	0,5	31	9,8	41	43	83	10	6	**10005**
10	1,0	31	9,8	41	43	83	10	6	**10010**
12	0,2	37	11,8	47	49	94	12	6	**12002**
12	0,5	37	11,8	47	49	94	12	6	**12005**
12	1,0	37	11,8	47	49	94	12	6	**12010**
16	0,5	49	15,8	61	63	111	16	8	**16005**
16	1,0	49	15,8	61	63	111	16	8	**16010**
16	2,0	49	15,8	61	63	111	16	8	**16020**

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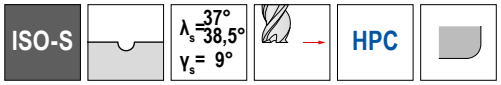
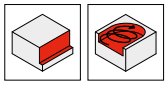
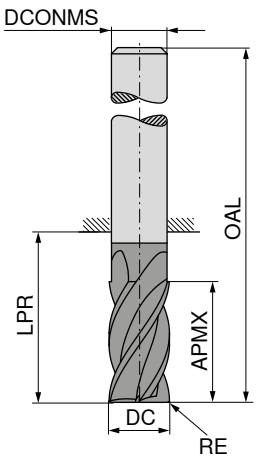
→ v_c/f_z Page 19

MonsterMill – End milling cutter with corner radius

▲ Cutting depth: 3 x DCwith chip breaker







DRAGONSKIN

Factory standard

53 040 ...

DC h10 mm	RE ±0,05 mm	APMX mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	
10	0,2	31	43	83	10	6	**10002**
10	1,0	31	43	83	10	6	**10010**
12	0,2	37	49	94	12	6	**12002**
12	1,0	37	49	94	12	6	**12010**
12	1,5	37	49	94	12	6	**12015**
12	2,0	37	49	94	12	6	**12020**
16	0,2	49	63	111	16	6	**16002**
16	1,0	49	63	111	16	6	**16010**
16	1,5	49	63	111	16	6	**16015**
16	2,0	49	63	111	16	6	**16020**
20	0,2	61	77	127	20	6	**20002**
20	1,0	61	77	127	20	6	**20010**
20	1,5	61	77	127	20	6	**20015**
20	2,0	61	77	127	20	6	**20020**

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Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm² / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm² / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm² / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm² / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm² / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm² / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm² / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm² / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm² / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm² / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm² / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm² / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm² / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm² / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm² / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm² / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm² / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm² / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm² / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm² / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm² / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm² / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm² / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm² / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm² / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm² / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm² / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm² / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm² / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm² / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm² / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm² / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm²	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm² / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
H	Hardened steel	H.1.1		Hardened and tempered	46–55 HRC				
		H.1.2		Hardened and tempered	56–60 HRC				
		H.1.3		Hardened and tempered	61–65 HRC				
		H.1.4		Hardened and tempered	66–70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 150 N/mm²				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm²				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm²				
		O.3.1	Graphite						

*** Tensile strength**

Cutting data standard values – MonsterMill – ISO-S – End mill

Index	Type long		53 034 ..., 53 035 ...																				
	v_c (m/min)	$a_{p\,max.}$ x DC	Ø DC (mm) = 3			4			5			6			8			10			12		
			a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC
			f_z (mm)																				
P.1.1																							
P.1.2																							
P.1.3																							
P.1.4																							
P.1.5																							
P.2.1																							
P.2.2																							
P.2.3																							
P.2.4																							
P.3.1																							
P.3.2																							
P.3.3																							
P.4.1																							
P.4.2																							
M.1.1																							
M.2.1																							
M.3.1																							
K.1.1																							
K.1.2																							
K.2.1																							
K.2.2																							
K.3.1																							
K.3.2																							
N.1.1																							
N.1.2																							
N.2.1																							
N.2.2																							
N.2.3																							
N.3.1																							
N.3.2																							
N.3.3																							
N.4.1																							
S.1.1	40	1,0	0,030	0,023		0,036	0,028		0,042	0,032		0,048	0,037		0,060	0,046		0,072	0,055		0,083	0,064	
S.1.2	40	1,0	0,030	0,023		0,036	0,028		0,042	0,032		0,048	0,037		0,060	0,046		0,072	0,055		0,083	0,064	
S.2.1	40	1,0	0,030	0,023		0,036	0,028		0,042	0,032		0,048	0,037		0,060	0,046		0,072	0,055		0,083	0,064	
S.2.2	40	1,0	0,030	0,023		0,036	0,028		0,042	0,032		0,048	0,037		0,060	0,046		0,072	0,055		0,083	0,064	
S.2.3	40	1,0	0,030	0,023		0,036	0,028		0,042	0,032		0,048	0,037		0,060	0,046		0,072	0,055		0,083	0,064	
S.3.1	80	1,0	0,042	0,033	0,025	0,051	0,039	0,030	0,059	0,046	0,035	0,068	0,052	0,040	0,085	0,065	0,050	0,101	0,078	0,060	0,118	0,091	0,070
S.3.2	60	1,0	0,034	0,026	0,020	0,041	0,031	0,024	0,047	0,036	0,028	0,054	0,042	0,032	0,067	0,051	0,040	0,080	0,062	0,048	0,093	0,072	0,055
S.3.3																							
H.1.1																							
H.1.2																							
H.1.3																							
H.1.4																							
H.2.1																							
H.3.1																							
O.1.1																							
O.1.2																							
O.2.1																							
O.2.2																							
O.3.1																							

Index	53 034 ..., 53 035 ...						● 1st choice ○ suitable		
	Ø DC (mm) =								
	16			20					
	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,6–1,0 x DC	Emulsion	Compressed air	MQL
	f_z (mm)								
P.1.1									
P.1.2									
P.1.3									
P.1.4									
P.1.5									
P.2.1									
P.2.2									
P.2.3									
P.2.4									
P.3.1									
P.3.2									
P.3.3									
P.4.1									
P.4.2									
M.1.1									
M.2.1									
M.3.1									
K.1.1									
K.1.2									
K.2.1									
K.2.2									
K.3.1									
K.3.2									
N.1.1									
N.1.2									
N.2.1									
N.2.2									
N.2.3									
N.3.1									
N.3.2									
N.3.3									
N.4.1									
S.1.1	0,101	0,078		0,116	0,089		●		
S.1.2	0,101	0,078		0,116	0,089		●		
S.2.1	0,101	0,078		0,116	0,089		●		
S.2.2	0,101	0,078		0,116	0,089		●		
S.2.3	0,101	0,078		0,116	0,089		●		
S.3.1	0,144	0,111	0,085	0,161	0,124	0,095	●		
S.3.2	0,113	0,087	0,067	0,127	0,098	0,075	●		
S.3.3									
H.1.1									
H.1.2									
H.1.3									
H.1.4									
H.2.1									
H.3.1									
O.1.1									
O.1.2									
O.2.1									
O.2.2									
O.3.1									

Cutting data standard values – MonsterMill – ISO-S – End mill

Index	Type extra long		53 036 ...													
			Ø DC (mm) =													
			3		4		5		6		8		10		12	
	v_c (m/min)	$a_{p\,max}$ x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC
			f_z (mm)													
P.1.1																
P.1.2																
P.1.3																
P.1.4																
P.1.5																
P.2.1																
P.2.2																
P.2.3																
P.2.4																
P.3.1																
P.3.2																
P.3.3																
P.4.1																
P.4.2																
M.1.1																
M.2.1																
M.3.1																
K.1.1																
K.1.2																
K.2.1																
K.2.2																
K.3.1																
K.3.2																
N.1.1																
N.1.2																
N.2.1																
N.2.2																
N.2.3																
N.3.1																
N.3.2																
N.3.3																
N.4.1																
S.1.1	35	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.1.2	35	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.2.1	35	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.2.2	35	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.2.3	35	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.3.1	75	1,0	0,033	0,025	0,039	0,030	0,046	0,035	0,052	0,040	0,065	0,050	0,078	0,060	0,091	0,070
S.3.2	50	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064
S.3.3																
H.1.1																
H.1.2																
H.1.3																
H.1.4																
H.2.1																
H.3.1																
O.1.1																
O.1.2																
O.2.1																
O.2.2																
O.3.1																

Index	53 036 ...				● 1st choice ○ suitable		
	Ø DC (mm) =						
	16		20				
	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	Emulsion	Compressed air	MQL
	f_z (mm)						
P.1.1							
P.1.2							
P.1.3							
P.1.4							
P.1.5							
P.2.1							
P.2.2							
P.2.3							
P.2.4							
P.3.1							
P.3.2							
P.3.3							
P.4.1							
P.4.2							
M.1.1							
M.2.1							
M.3.1							
K.1.1							
K.1.2							
K.2.1							
K.2.2							
K.3.1							
K.3.2							
N.1.1							
N.1.2							
N.2.1							
N.2.2							
N.2.3							
N.3.1							
N.3.2							
N.3.3							
N.4.1							
S.1.1	0,101	0,078	0,116	0,089	●		
S.1.2	0,101	0,078	0,116	0,089	●		
S.2.1	0,101	0,078	0,116	0,089	●		
S.2.2	0,101	0,078	0,116	0,089	●		
S.2.3	0,101	0,078	0,116	0,089	●		
S.3.1	0,111	0,085	0,124	0,095	●		
S.3.2	0,101	0,078	0,116	0,089	●		
S.3.3							
H.1.1							
H.1.2							
H.1.3							
H.1.4							
H.2.1							
H.3.1							
O.1.1							
O.1.2							
O.2.1							
O.2.2							
O.3.1							

Cutting data standard values – MonsterMill – ISO-S – End mill

Index	Type long		53 037 ..., 53 038 ...																● 1st choice ○ suitable		
	v_c (m/min)	$a_{p\,max.}$ x DC	Ø DC (mm) = 3		4		5		6		8		10		12		16		Emulsion	Compressed air	MQL
			a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC	a_e 0,1–0,2 x DC	a_e 0,3–0,4 x DC			
			f_z (mm)																		
P.1.1																					
P.1.2																					
P.1.3																					
P.1.4																					
P.1.5																					
P.2.1																					
P.2.2																					
P.2.3																					
P.2.4																					
P.3.1																					
P.3.2																					
P.3.3																					
P.4.1																					
P.4.2																					
M.1.1																					
M.2.1																					
M.3.1																					
K.1.1																					
K.1.2																					
K.2.1																					
K.2.2																					
K.3.1																					
K.3.2																					
N.1.1																					
N.1.2																					
N.2.1																					
N.2.2																					
N.2.3																					
N.3.1																					
N.3.2																					
N.3.3																					
N.4.1																					
S.1.1	40	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.1.2	40	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.2.1	40	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.2.2	40	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.2.3	40	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.3.1	80	1,0	0,039	0,030	0,047	0,036	0,055	0,042	0,062	0,048	0,078	0,060	0,094	0,072	0,109	0,084	0,133	0,102	●		
S.3.2	60	1,0	0,030	0,023	0,036	0,028	0,042	0,032	0,048	0,037	0,060	0,046	0,072	0,055	0,083	0,064	0,101	0,078	●		
S.3.3																					
H.1.1																					
H.1.2																					
H.1.3																					
H.1.4																					
H.2.1																					
H.3.1																					
O.1.1																					
O.1.2																					
O.2.1																					
O.2.2																					
O.3.1																					

Cutting data standard values – MonsterMill – ISO-S – End mill

Index	Type long		53 039 ...					● 1st choice ○ suitable		
			Ø DC (mm) =							
			6	8	10	12	16			
			a_e 0,05 x DC							
	v_c (m/min)	$a_{p\,max.}$ x DC	f_z (mm)					Emulsion	Compressed air	MQL
P.1.1										
P.1.2										
P.1.3										
P.1.4										
P.1.5										
P.2.1										
P.2.2										
P.2.3										
P.2.4										
P.3.1										
P.3.2										
P.3.3										
P.4.1										
P.4.2										
M.1.1										
M.2.1										
M.3.1										
K.1.1										
K.1.2										
K.2.1										
K.2.2										
K.3.1										
K.3.2										
N.1.1										
N.1.2										
N.2.1										
N.2.2										
N.2.3										
N.3.1										
N.3.2										
N.3.3										
N.4.1										
S.1.1	40	2,0	0,029	0,036	0,043	0,051	0,062	●		
S.1.2	40	2,0	0,029	0,036	0,043	0,051	0,062	●		
S.2.1	40	2,0	0,029	0,036	0,043	0,051	0,062	●		
S.2.2	40	2,0	0,029	0,036	0,043	0,051	0,062	●		
S.2.3	40	2,0	0,029	0,036	0,043	0,051	0,062	●		
S.3.1	80	2,0	0,040	0,050	0,060	0,070	0,085	●		
S.3.2	60	2,0	0,032	0,040	0,048	0,055	0,067	●		
S.3.3										
H.1.1										
H.1.2										
H.1.3										
H.1.4										
H.2.1										
H.3.1										
O.1.1										
O.1.2										
O.2.1										
O.2.2										
O.3.1										

Cutting data standard values– MonsterMill – end mill – ISO-S, trochoidal milling

Index	Type long			53 040												● 1st choice ○ suitable		
				Ø DC (mm) =														
				10			12			16			20					
	v_c (m/min)	$a_{p\,max.}$ x DC	max. angle of engagement	a_e 0,05 x DC	a_e 0,10 x DC	h_m	a_e 0,05 x DC	a_e 0,10 x DC	h_m	a_e 0,05 x DC	a_e 0,10 x DC	h_m	a_e 0,05 x DC	a_e 0,10 x DC	h_m	Emulsion	Compressed air	MQL
				f_z (mm)			f_z (mm)			f_z (mm)			f_z (mm)					
P.1.1																		
P.1.2																		
P.1.3																		
P.1.4																		
P.1.5																		
P.2.1																		
P.2.2																		
P.2.3																		
P.2.4																		
P.3.1																		
P.3.2																		
P.3.3																		
P.4.1																		
P.4.2																		
M.1.1																		
M.2.1																		
M.3.1																		
K.1.1																		
K.1.2																		
K.2.1																		
K.2.2																		
K.3.1																		
K.3.2																		
N.1.1																		
N.1.2																		
N.2.1																		
N.2.2																		
N.2.3																		
N.3.1																		
N.3.2																		
N.3.3																		
N.4.1																		
S.1.1	85	3,0	25°	0,044		0,010	0,053		0,012	0,066		0,015	0,075		0,02	●		
S.1.2	85	3,0	25°	0,044		0,010	0,053		0,012	0,066		0,015	0,075		0,02	●		
S.2.1	65	3,0	25°	0,044		0,010	0,053		0,012	0,066		0,015	0,075		0,02	●		
S.2.2	65	3,0	25°	0,044		0,010	0,053		0,012	0,066		0,015	0,075		0,02	●		
S.2.3	65	3,0	25°	0,044		0,010	0,053		0,012	0,066		0,015	0,075		0,02	●		
S.3.1	160	3,0	30°	0,085	0,065	0,021	0,103	0,079	0,025	0,129	0,099	0,031	0,146	0,112	0,04	●		
S.3.2	120	3,0	30°	0,085	0,065	0,021	0,103	0,079	0,025	0,129	0,099	0,031	0,146	0,112	0,04	●		
S.3.3																		
H.1.1																		
H.1.2																		
H.1.3																		
H.1.4																		
H.2.1																		
H.3.1																		
O.1.1																		
O.1.2																		
O.2.1																		
O.2.2																		
O.3.1																		

We reserve the right to make technical changes and product improvements.

CERATIZIT GROUP

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