NEW

Uncompromised Performance in ISO-S Applications

The MonsterMill ISO-S shows increased tool live in the most demanding applications.

CERATIZIT is a high-technology engineering group specialized in cutting tools and hard material solutions.

Tooling a Sustainable Future

ceratizit.com

CERATIZIT GROUP

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https://cuttingtools.ceratizit.com
1-800-783-2280 (US) or 1-905-551-1743 (Canada)
customerservice.usa@ceratizit.com
customerservice.canada@ceratizit.com
techsupport.usa@ceratizit.com

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MonsterMill – ISO-S

Unbeatable performance for nickel-based alloys and titanium

When machining materials like nickel-based or titanium alloys, the limits of efficient production are often reached more quickly than desired. To stay competitive in the premium machining segment, we have re-imagined the MonsterMill – ISO-S milling cutter range. An ideal combination of carbide, coating, and geometry ensures stable tools with smooth cutting performance. In addition to the proven 4- and 5-flute versions, the range now features the ideal finishing tool in the 6-flute MonsterMill – ISO-S.
To further optimize efficiency and process-security when machining ISO-S materials, a new trochoidal milling cutter is also available. The trochoidal milling technique enables a more even load distribution and minimizes thermal loads, resulting in an increased tool life.

Machine ISO-S materials without compromise

Machining titanium, Inconel, Hastelloy, Waspaloy, and other nickel-based alloys is significantly more demanding compared to conventional materials and can cause machining costs to skyrocket. The high tensile strength of the material combined with its extreme hardness can rapidly speed up tool wear.

Our solution

Only tools designed specifically for these materials, such as the **MonsterMill – ISO-S**, can minimize wear, maximize tool life, and ensure reliable processes.

Optimal cutting edge geometry and performance coating counteract vibrations and heat

Special cutting edge preparation
+ Stabilizes the cutting edge over the long term
+ Prevents premature fractures

Irregular pitch of the cutting edges & variable helix angle
+ Reduce oscillations and vibrations
+ Increase machining performance and surface quality on the workpiece

Linear clearance angle & polished grind in the chip space
+ Optimum chip removal
+ Maximum process security

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

“We have adapted the geometry of the new milling cutter to minimize the heat generated during the machining process. The polished chip flutes and optimized coating reduce friction and ensure efficient chip removal, meaning longer tool lives and maximum process security.“

Michael Wucher, Global Product Manager, Solid Carbide Milling Tools

MonsterMill – ISO-S

Wide selection of tools ideal for the aerospace industry

End mill with 4 flutes

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

End mill with 5 flutes

- Diameter range 3-16 mm
- Shank forms HA and HB
- Various corner radii

Finish milling cutter with 6-8 flutes

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

Milling cutter ideal for trochoidal milling with 6 flutes

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

The most common dimensions for the aerospace industry are covered while custom dimensions are available on request.

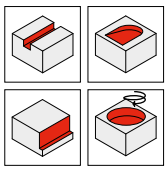
Our experts promise:
There will be practical additions to the series in the near future, which will expand the scope of applications for the ISO-S specialists even further.

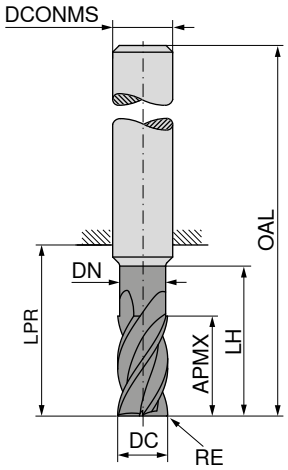
Long tool life – Process-secure – Stable

- Specially designed for machining nickel-based alloys and titanium
- Polished chip flutes ensure outstanding chip removal
- Cutting edges designed for smooth cutting performance, reducing heat generated during the machining process
- Optimal stability of cutting edge and core geometry
- Carbide and coating ensure low tool wear
- The latest DRAGONSKIN coating technology, developed for demanding ISO-S materials
- Tool design ideally suited for regrinding
- Extremely wide range and large selection of tools

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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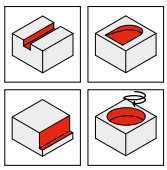
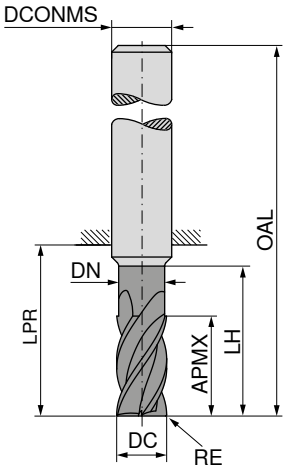
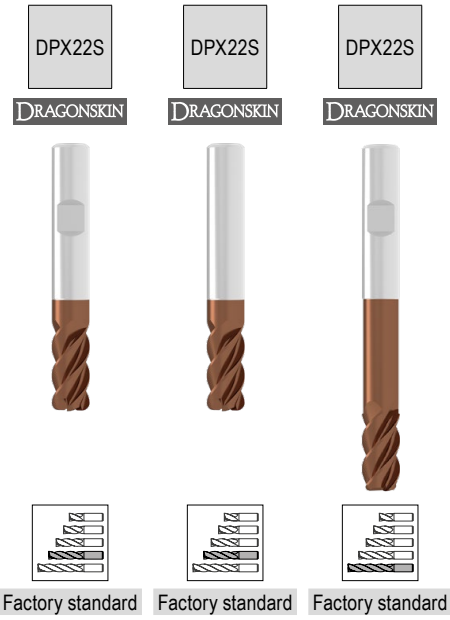
→ v_c/f_z Page 14–17

MonsterMill – End milling cutter with corner radius

ISO-S | λ_s=35° γ_s=38° γ_s=13° | HPC







Factory standard | Factory standard | Factory standard

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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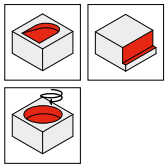
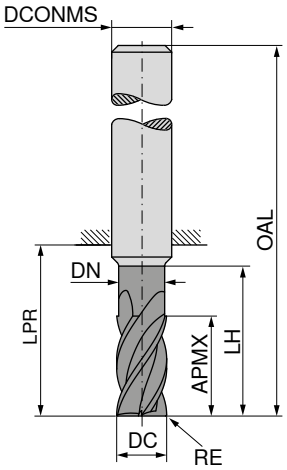
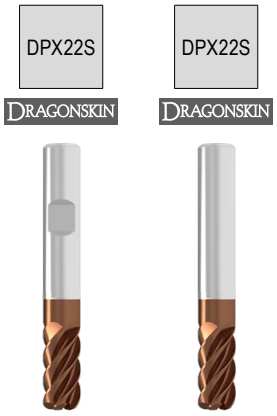
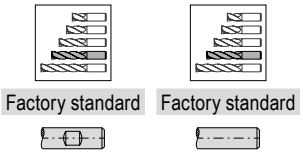
MonsterMill – End milling cutter with corner radius

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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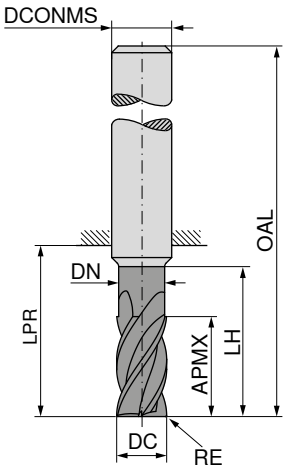
MonsterMill – Finish milling cutter with corner radius

▲ Cutting depth: 3 x DC

ISO-S | λ_s=48° 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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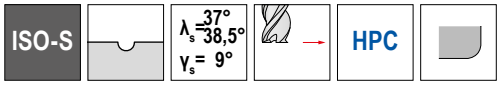
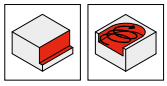
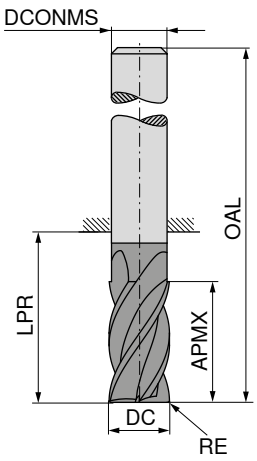
MonsterMill – End milling cutter with corner radius

▲ Cutting depth: 3 x DCwith chip breaker







DPX22S

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 lbf/in²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C	Annealed	60900 lbf/in² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C	Annealed	92800 lbf/in² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3		Tempered	121800 lbf/in² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C	Annealed	132000 lbf/in² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5		Tempered	146500 lbf/in² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1		Annealed	88500 lbf/in² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2		Tempered	134900 lbf/in² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3		Tempered	146500 lbf/in² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4		Tempered	174000 lbf/in² / 375 HB	1.7225	4142	17223	4140
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	98600 lbf/in² / 200 HB	1.4021	420	1.2379	D2
		P.3.2		Hardened and tempered	159500 lbf/in² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3		Hardened and tempered	188500 lbf/in² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	98600 lbf/in² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic	Tempered	117500 lbf/in² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	88500 lbf/in² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic	Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)		113100 lbf/in² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic		88500 lbf/in² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)		127600 lbf/in² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic		78300 lbf/in² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic		122600 lbf/in² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic		63800 lbf/in² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic		113100 lbf/in² / 230 HB	0.8170	70003		
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable		49300 lbf/in² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		36300 lbf/in² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable		43500 lbf/in² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable		63800 lbf/in² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		54400 lbf/in² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn		43500 lbf/in² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper		49300 lbf/in² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn		
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	98600 lbf/in² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2			137800 lbf/in² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis	Annealed	121800 lbf/in² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2			171100 lbf/in² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in² / 320 HB	2.4674	Nimocast PK24	2.4670	Nimocast 713
	Titanium alloys	S.3.1	Pure titanium		5800 lbf/in²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys		152300 lbf/in²	3.7165	TiAl6V4		
		S.3.3	Beta alloys		203100 lbf/in² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr		
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		≤ 21800 lbf/in²				
		O.1.2	Plastics, thermoplastic		≤ 14500 lbf/in²				
		O.2.1	Aramid fibre-reinforced		≤ 145000 lbf/in²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 145000 lbf/in²				
		O.3.1	Graphite						

*** Tensile Strength at Rupture (Rm)**

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

	Long version		53 034 ..., 53 035 ...																				
			Ø DC (mm) =																				
			3			4			5			6			8			10			12		
Index	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 0,6–1,0 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	MMS
	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	Extra-long version		53 036 ...													
			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 0,1–0,2 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
	v_c (m/min)	$a_{p\,max}$ 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 ... Ø DC (mm) = 16 a_e 0,1–0,2 x DC f_z (mm)	53 036 ... Ø DC (mm) = 16 a_e 0,3–0,4 x DC f_z (mm)	53 036 ... Ø DC (mm) = 20 a_e 0,1–0,2 x DC f_z (mm)	53 036 ... Ø DC (mm) = 20 a_e 0,3–0,4 x DC f_z (mm)	● 1st choice ○ Suitable Emulsion	Compressed air	MMS
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

● 1st choice
○ Suitable

Long version: 53 037 ..., 53 038 ... — Ø DC (mm) = ; f_z (mm)

Index	v_c (m/min)	$a_{p\ max.}$ x DC	3: a_e 0,1–0,2 x DC	3: a_e 0,3–0,4 x DC	4: a_e 0,1–0,2 x DC	4: a_e 0,3–0,4 x DC	5: a_e 0,1–0,2 x DC	5: a_e 0,3–0,4 x DC	6: a_e 0,1–0,2 x DC	6: a_e 0,3–0,4 x DC	8: a_e 0,1–0,2 x DC	8: a_e 0,3–0,4 x DC	10: a_e 0,1–0,2 x DC	10: a_e 0,3–0,4 x DC	12: a_e 0,1–0,2 x DC	12: a_e 0,3–0,4 x DC	16: a_e 0,1–0,2 x DC	16: a_e 0,3–0,4 x DC	Emulsion	Compressed air	MMS
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	Long version		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	MMS
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	Long version			53 040												● 1st choice ○ Suitable		
				Ø DC (mm) =														
				10			12			16			20					
	v_c (m/min)	$a_{p\,max.}$ x DC	Maximum 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	MMS
				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																		

CERATIZIT USA, LLC.
625 Griffith Rd., Suite 120 \ Charlotte, NC 28217
1-800-783-2280
customerservice.usa@ceratizit.com \ cuttingtools.ceratizit.com

CERATIZIT GROUP

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