Vischer & Bolli
OSG GROUP COMPANY

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TuffCut® XM Hochleistungs-Mikrofräser

Präzisionsbearbeitung zu sensationellen Preisen

M.A. FORD
High Performance Cutting Tools

XM2B Serie

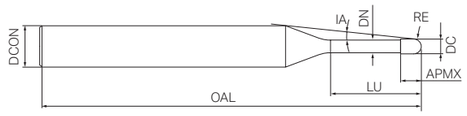
TuffCut® XM Kugelfräser

2-lippig
Hinterschliffen

P M K N S H

Z2 | ALtima® Xtreme | <60 HRC | bis zu 20D | ± 0,003<0,25 ± 0,005>0,25

M.A. FORD
High Performance Cutting Tools



Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
									0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2B-01N0.2X	0.1	0.05	0.2	0.08	0.08	50.0	4.0	14.66°	0.20	0.21	0.22	0.24	0.26				
XM2B-01N0.3X			0.3					14.48°	0.31	0.33	0.34	0.36	0.39				
XM2B-01N0.5X			0.5					14.12°	0.52	0.55	0.57	0.59	0.64				
XM2B-02N0.5X	0.2	0.1	0.5	0.16	0.17	50.0	4.0	14.21°	0.51	0.53	0.55	0.57	0.61				
XM2B-02N0.75X			0.75					13.77°	0.78	0.80	0.83	0.86	0.92				
XM2B-02N1X			1.0					13.36°	1.04	1.07	1.11	1.15	1.23				
XM2B-02N1.25X			1.25					12.97°	1.30	1.34	1.39	1.43	1.54				
XM2B-02N1.5X			1.5					12.6°	1.56	1.61	1.66	1.72	1.85				
XM2B-02N2X			2.0					11.92°	2.07	2.14	2.22	2.30	2.48				
XM2B-02N2.5X			2.5					11.31°	2.59	2.68	2.77	2.87	3.10				
XM2B-02N3X			3.0					10.76°	3.11	3.21	3.33	3.45	3.72				
XM2B-03N0.5X	0.3	0.15	0.5	0.24	0.27	50.0	4.0	14.17°	0.52	0.55	0.57	0.60	0.66				
XM2B-03N0.75X			0.75					13.72°	0.79	0.83	0.87	0.91	0.98				
XM2B-03N1X			1.0					13.3°	1.05	1.11	1.16	1.20	1.29				
XM2B-03N1.25X			1.25					12.9°	1.32	1.38	1.44	1.50	1.61				
XM2B-03N1.5X			1.5					12.53°	1.58	1.66	1.72	1.78	1.92				
XM2B-03N2X			2.0					11.84°	2.11	2.20	2.28	2.36	2.54				
XM2B-03N2.5X			2.5					11.22°	2.63	2.74	2.83	2.93	3.16				
XM2B-03N3X			3.0					10.66°	3.15	3.27	3.39	3.51	3.78				
XM2B-04N0.75X	0.4	0.2	0.75	0.32	0.37	50.0	4.0	13.78°	0.78	0.82	0.86	0.90	0.97				
XM2B-04N1X			1.0					13.34°	1.05	1.10	1.15	1.19	1.28				
XM2B-04N1.5X			1.5					12.55°	1.58	1.65	1.72	1.78	1.90				
XM2B-04N2X			2.0					11.84°	2.11	2.19	2.27	2.35	2.53				
XM2B-04N2.5X			2.5					11.2°	2.63	2.73	2.83	2.93	3.15				
XM2B-04N3X			3.0					10.63°	3.15	3.27	3.38	3.50	3.77				
XM2B-04N3.5X			3.5					10.12°	3.67	3.80	3.94	4.08	4.39				
XM2B-04N4X			4.0					9.65°	4.19	4.34	4.49	4.65	5.01				
XM2B-04N4.5X			4.5					9.22°	4.71	4.87	5.04	5.23	5.63				
XM2B-05N1X	0.5	0.25	1.0	0.4	0.47	50.0	4.0	13.39°	1.05	1.09	1.14	1.19	1.27				
XM2B-05N1.5X			1.5					12.56°	1.58	1.65	1.71	1.77	1.89				
XM2B-05N2X			2.0					11.83°	2.10	2.19	2.27	2.34	2.51				
XM2B-05N2.5X			2.5					11.18°	2.63	2.73	2.82	2.92	3.14				
XM2B-05N3X			3.0					10.6°	3.15	3.27	3.38	3.49	3.76				
XM2B-05N4X			4.0					9.6°	4.19	4.34	4.48	4.64	5.00				
XM2B-05N5X			5.0					8.77°	5.23	5.41	5.59	5.79	6.24				
XM2B-05N5.5X			5.5					8.4°	5.75	5.94	6.15	6.37	6.86				
XM2B-05N6X			6.0					8.07°	6.27	6.48	6.70	6.94	7.49				
XM2B-05N8X			8.0					6.96°	8.33	8.62	8.92	9.24	9.97				
XM2B-06N1X	0.6	0.3	1.0	0.48	0.57	50.0	4.0	13.15°	1.07	1.14	1.20	1.27	1.41				
XM2B-06N2X			2.0					11.61°	2.15	2.28	2.39	2.50	2.70				
XM2B-06N2.5X			2.5					10.96°	2.68	2.84	2.97	3.09	3.32				
XM2B-06N3X			3.0					10.38°	3.22	3.39	3.54	3.67	3.95				
XM2B-06N3.5X			3.5					9.86°	3.75	3.94	4.10	4.25	4.57				
XM2B-06N4X			4.0					9.39°	4.28	4.48	4.66	4.82	5.19				
XM2B-06N4.5X			4.5					8.97°	4.81	5.03	5.21	5.40	5.81				
XM2B-06N5X			5.0					8.57°	5.33	5.57	5.77	5.97	6.43				
XM2B-06N5.5X			5.5					8.22°	5.86	6.11	6.32	6.55	7.05				
XM2B-06N6X			6.0					7.89°	6.38	6.64	6.87	7.12	7.67				
XM2B-06N7X			7.0					7.3°	7.43	7.71	7.98	8.27	8.92				
XM2B-06N8X			8.0					6.79°	8.48	8.78	9.09	9.42	10.16				
XM2B-06N9X			9.0					6.35°	9.52	9.85	10.20	10.57	11.40				
XM2B-06N10X			10.0					5.97°	10.56	10.92	11.31	11.72	12.65				
XM2B-06N12X			12.0					5.32°	12.63	13.06	13.52	14.02	15.13				
XM2B-07N2X	0.7	0.35	2.0	0.56	0.67	50.0	4.0	11.6°	2.14	2.27	2.39	2.49	2.69				
XM2B-07N4X			4.0					9.33°	4.27	4.48	4.65	4.81	5.18				
XM2B-07N6X			6.0					7.81°	6.38	6.64	6.87	7.11	7.66				
XM2B-07N8X			8.0					6.71°	8.47	8.78	9.09	9.41	10.15				
XM2B-08N2X	0.8	0.4	2.0	0.64	0.76	50.0	4.0	11.64°	2.12	2.24	2.35	2.45	2.63				
XM2B-08N4X			4.0					9.3°	4.25	4.44	4.61	4.77	5.12				
XM2B-08N5X			5.0					8.45°	5.30	5.53	5.72	5.92	6.36				
XM2B-08N6X			6.0					7.74°	6.35	6.60	6.83	7.07	7.61				
XM2B-08N8X			8.0					6.63°	8.44	8.74	9.04	9.37	10.09				
XM2B-08N10X			10.0					5.8°	10.52	10.88	11.26	11.67	12.58				
XM2B-09N2X	0.9	0.45	2.0	0.72	0.86	50.0	4.0	11.63°	2.12	2.23	2.34	2.44	2.62				
XM2B-09N4X			4.0					9.24°	4.25	4.44	4.60	4.76	5.11				
XM2B-09N6X			6.0					7.66°	6.35	6.60	6.82	7.06	7.60				
XM2B-09N8X			8.0					6.54°	8.44	8.74	9.04	9.36	10.08				
XM2B-10N2X	1.0	0.5	2.0	0.8	0.96	50.0	4.0	11.62°	2.12	2.23	2.33	2.43	2.61				
XM2B-10N3X			3.0					10.25°	3.18	3.34	3.48	3.60	3.85				
XM2B-10N4X			4.0					9.17°	4.24	4.43	4.60	4.75	5.10				
XM2B-10N5X			5.0					8.29°	5.30	5.52	5.71	5.90	6.34				

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
									0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2B-10N6X	1.0	0.5	6.0	0.8	0.96	50.0	4.0	7.57°	6.35	6.59	6.81	7.05	7.58				
XM2B-10N7X			7.0					6.96°	7.39	7.66	7.92	8.20	8.83				
XM2B-10N8X			8.0					6.44°	8.44	8.73	9.03	9.35	10.07				
XM2B-10N9X			9.0					5.99°	9.48	9.80	10.14	10.50	11.31				
XM2B-10N10X			10.0					5.6°	10.52	10.87	11.25	11.65	12.56				
XM2B-10N12X			12.0					4.96°	12.59	13.01	13.46	13.95	15.04				
XM2B-10N13X			13.0					4.69°	13.62	14.08	14.57	15.10	16.29				
XM2B-10N14X			14.0					4.45°	14.66	15.15	15.68	16.25	17.53				
XM2B-10N16X			16.0					4.03°	16.73	17.29	17.90	18.55	20.01				
XM2B-10N18X			18.0					3.69°	18.79	19.43	20.11	20.85	22.50				
XM2B-10N20X			20.0					3.4°	20.86	21.57	22.33	23.15	24.99				
XM2B-11N2X	1.1	0.55	2.0	0.88	1.06	50.0	4.0	11.61°	2.11	2.22	2.32	2.42	2.60				
XM2B-11N4X			4.0					9.09°	4.24	4.43	4.59	4.74	5.08				
XM2B-11N6X			6.0					7.47°	6.34	6.59	6.81	7.04	7.57				
XM2B-11N8X			8.0					6.34°	8.43	8.73	9.03	9.34	10.06				
XM2B-11N10X			10.0					5.5°	10.51	10.87	11.24	11.64	12.54				
XM2B-12N4X	1.2	0.6	4.0	0.96	1.15	50.0	4.0	9.05°	4.22	4.40	4.55	4.70	5.04				
XM2B-12N8X			8.0					6.25°	8.41	8.70	8.99	9.30	10.01				
XM2B-12N10X			10.0					5.41°	10.49	10.84	11.21	11.60	12.50				
XM2B-12N12X			12.0					4.77°	12.56	12.97	13.42	13.90	14.98				
XM2B-14N8X	1.4	0.7	8.0	1.12	1.34	50.0	4.0	6.04°	8.38	8.66	8.95	9.26	9.96				
XM2B-14N12X			12.0			55.0		4.56°	12.53	12.94	13.38	13.86	14.93				
XM2B-14N16X			16.0					3.67°	16.66	17.22	17.82	18.46	19.90				
XM2B-15N4X	1.5	0.75	4.0	1.2	1.44	50.0	4.0	8.82°	4.20	4.36	4.51	4.65	4.97				
XM2B-15N6X			6.0					7.08°	6.29	6.52	6.73	6.95	7.46				
XM2B-15N8X			8.0					5.92°	8.38	8.66	8.95	9.25	9.94				
XM2B-15N10X			10.0					5.08°	10.46	10.80	11.16	11.55	12.43				
XM2B-15N12X			12.0					4.45°	12.53	12.94	13.38	13.85	14.92				
XM2B-15N14X			14.0			55.0		3.96°	14.60	15.08	15.60	16.15	17.40				
XM2B-15N16X			16.0					3.57°	16.66	17.22	17.81	18.45	19.89				
XM2B-15N18X			18.0			60.0		3.25°	18.73	19.36	20.03	20.75	22.38				
XM2B-15N20X			20.0					2.98°	20.80	21.50	22.25	23.05	-				
XM2B-16N8X	1.6	0.8	8.0	1.28	1.54	50.0	4.0	5.8°	8.38	8.66	8.94	9.25	9.93				
XM2B-16N12X			12.0			55.0		4.34°	12.53	12.94	13.37	13.85	14.90				
XM2B-16N16X			16.0					3.47°	16.66	17.21	17.81	18.44	19.88				
XM2B-16N20X			20.0			60.0		2.89°	20.80	21.49	22.24	23.04	-				
XM2B-18N8X	1.8	0.90	8.00	1.44	1.73	50.0	4.0	5.55°	8.36	8.63	8.91	9.21	9.88				
XM2B-18N12X			8.00					4.11°	12.50	12.91	13.34	13.81	14.85				
XM2B-18N16X			16.00			55.0		3.26°	16.64	17.19	17.77	18.41	19.83				
XM2B-18N20X			20.00			60.0		2.7°	20.77	21.46	22.21	23.01	-				
XM2B-20N3X	2.0	1.0	3.0	1.6	1.92	50.0	4.0	9.72°	3.11	3.22	3.32	3.42	3.62				
XM2B-20N4X			4.0					8.32°	4.16	4.31	4.44	4.57	4.86				
XM2B-20N6X			6.0					6.46°	6.26	6.46	6.66	6.87	7.35				
XM2B-20N8X			8.0					5.27°	8.34	8.60	8.88	9.17	9.84				
XM2B-20N10X			10.0					4.46°	10.41	10.74	11.09	11.47	12.32				
XM2B-20N12X			12.0					3.86°	12.48	12.88	13.31	13.77	14.81				
XM2B-20N13X			13.0			55.0		3.62°	13.51	13.95	14.42	14.92	16.05				
XM2B-20N14X			14.0					3.4°	14.55	15.02	15.53	16.07	17.29				
XM2B-20N16X			16.0					3.04°	16.62	17.16	17.74	18.37	19.78				
XM2B-20N18X			18.0					2.75°	18.68	19.30	19.96	20.67	-				
XM2B-20N20X			20.0			60.0		2.51°	20.75	21.44	22.18	22.97	-				
XM2B-20N22X			22.0					2.31°	22.82	23.58	24.39	25.27	-				
XM2B-20N25X			25.0			65.0		2.06°	25.92	26.79	27.72	28.72	-				
XM2B-20N30X			30.0			70.0		1.75°	31.09	32.14	33.26	-	-				
XM2B-20N35X			35.0			75.0		1.52°	36.26	37.48	38.80	-	-				
XM2B-20N40X			40.0			80.0		1.34°	41.42	42.83	-	-	-				
XM2B-25N6X	2.5	1.25	6.0	2.0	2.4	50.0	4.0	5.62°	6.22	6.41	6.60	6.80	7.25				
XM2B-25N10X			10.0					3.69°	10.37	10.69	11.03	11.40	12.23				
XM2B-25N15X			15.0			55.0		2.59°	15.54	16.04	16.58	17.15	-				
XM2B-25N20X			20.0			60.0		1.99°	20.71	21.39	22.12	-	-				
XM2B-25N25X			25.0			65.0		1.62°	25.88	26.74	27.66	-	-				
XM2B-25N30X			30.0			70.0		1.36°	31.05	32.09	-	-	-				
XM2B-30N8X	3.0	1.5	8.0	2.4	2.88	55.0	6.0	7.04°	8.27	8.51	8.77	9.04	9.65				
XM2B-30N10X			10.0					6.05°	10.34	10.65	10.98	11.34	12.14				
XM2B-30N13X			13.0			60.0		5°	13.44	13.86	14.31	14.79	15.87				
XM2B-30N16X			16.0					4.26°	16.55	17.07	17.63	18.24	19.60				
XM2B-30N20X			20.0			65.0		3.56°	20.68	21.35	22.07	22.84	24.57				
XM2B-30N25X			25.0			70.0		2.95°	25.85	26.70	27.61	28.59	-				
XM2B-30N30X			30.0			75.0		2.52°	31.02	32.05	33.15	34.34	-				
XM2B-30N35X			35.0			80.0		2.2°	36.19	37.39	38.69	40.08	-				
XM2B-35N15X	3.5	1.75	15.0	2.8	3.36	60.0	6.0	3.99°	15.49	15.96	16.48	17.03	18.27				
XM2B-35N25X			25.0			70.0		2.56°	25.82	26.66	27.56	28.53	-				
XM2B-35N35X			35.0			80.0		1.89°	36.16	37.36	38.64	-	-				
XM2B-35N45X			45.0			90.0		1.5°	46.50	48.05	-	-	-				
XM2B-40N10X	4.0	2.0	10.0	3.2	3.86	55.0	6.0	4.86°	10.31	10.60	10.91	11.24	11.99				
XM2B-40N13X			13.0			60.0		3.88°	13.41	13.81	14.23	14.69	15.72				
XM2B-40N16X			16.0					3.23°	16.51	17.02	17.56	18.14	19.45				
XM2B-40N20X			20.0			65.0		2.63°	20.65	21.30	21.99	22.74	-				
XM2B-40N25X			25.0			70.0		2.14°	25.81	26.64	27.53	28.49	-				
XM2B-40N30X			30.0			75.0		1.81°	30.98	31.99	33.08	-	-				
XM2B-40N35X	4.0	2.0	35.0	3.2	3.86	80.0	6.0	1.56°	36.15	37.34	38.62	-	-				
XM2B-40N40X			40.0					1.38°	41.32	42.69	-	-	-				
XM2B-40N45X			45.0			90.0		1.23°	46.49	48.04	-	-	-				
XM2B-40N50X			50.0			100.0		1.11°	51.66	53.39	-	-	-				
XM2B-50N20X	5.0	2.5	20.0	4.0	4.85	65.0	6.0	1.48°	20.62	21.25	-	-	-				
XM2B-50N25X			25.0			70.0		1.18°	25.79	26.60	-	-	-				
XM2B-50N30X			30.0			75.0		0.98°	30.96	-	-	-	-				
XM2B-50N40X			40.0			80.0		0.73°	41.29	-	-	-	-				
XM2B-60N12X	6.0	3.0	12.0	6.0	5.85	60.0	6.0	-	-	-	-	-	-				
XM2B-60N20X			20.0			65.0		-	-	-	-	-	-				
XM2B-60N30X			30.0			75.0		-	-	-	-	-	-				
XM2B-60N50X			50.0			100.0		-	-	-	-	-	-				

AB CHF 200.–
3%
E-COMMERCE RABATT

XM2R Serie

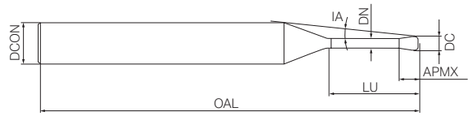
TuffCut® XM Eckradiusfräser

2-lippig
Hinterschliffen

P M K N S H

Z2 | ALtima® Xtreme | <60 HRC | bis zu 20D | R ± 0,005

M.A. FORD High Performance Cutting Tools



Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel 0.5°	1°	1.5°	2°	3°	ab 3 Stk. -5%	ab 5 Stk. -10%	ab 10 Stk. -15%	ab 20 Stk. -20%
XM2R-02N05-002	0.2	0.02	0.5	0.16	0.17	50.0	4.0	14.07°	0.52	0.54	0.56	0.58	0.63				
XM2R-02N1-002			1.0					13.23°	1.04	1.08	1.12	1.16	1.25				
XM2R-02N2-002			2.0					11.82°	2.08	2.15	2.23	2.31	2.50				
XM2R-02N05-005		0.05	0.5					14.12°	0.52	0.54	0.56	0.58	0.62				
XM2R-02N1-005			1.0					13.28°	1.04	1.08	1.11	1.15	1.24				
XM2R-02N15-005			1.5					12.53°	1.56	1.61	1.67	1.73	1.87				
XM2R-02N2-005			2.0					11.85°	2.08	2.15	2.22	2.30	2.49				
XM2R-03N1-002	0.3	0.02	1.0	0.24	0.27	50.0	4.0	13.09°	1.06	1.12	1.17	1.23	1.33				
XM2R-03N2-002			2.0					11.67°	2.11	2.21	2.29	2.38	2.57				
XM2R-03N3-002			3.0					10.53°	3.16	3.28	3.40	3.53	3.81				
XM2R-03N1-005		0.05	1.0					13.14°	1.06	1.12	1.17	1.22	1.32				
XM2R-03N15-005			1.5					12.38°	1.59	1.66	1.73	1.80	1.94				
XM2R-03N2-005			2.0					11.71°	2.11	2.21	2.29	2.37	2.56				
XM2R-03N25-005			2.5					11.11°	2.64	2.75	2.84	2.95	3.18				
XM2R-03N3-005			3.0					10.56°	3.16	3.28	3.40	3.52	3.81				
XM2R-04N1-002	0.4	0.02	1.0	0.32	0.37	50.0	4.0	13.04°	1.06	1.12	1.17	1.23	1.33				
XM2R-04N2-002			2.0					11.6°	2.11	2.21	2.29	2.38	2.57				
XM2R-04N3-002			3.0					10.44°	3.16	3.28	3.40	3.53	3.81				
XM2R-04N4-002			4.0					9.49°	4.20	4.35	4.51	4.68	5.06				
XM2R-04N1-005		0.05	1.0					13.09°	1.06	1.12	1.17	1.22	1.32				
XM2R-04N15-005			1.5					12.32°	1.59	1.66	1.73	1.80	1.94				
XM2R-04N2-005			2.0					11.64°	2.11	2.21	2.29	2.37	2.56				
XM2R-04N25-005			2.5					11.03°	2.64	2.75	2.84	2.95	3.18				
XM2R-04N3-005			3.0					10.47°	3.16	3.28	3.40	3.52	3.81				
XM2R-04N35-005			3.5					9.97°	3.68	3.82	3.95	4.10	4.43				
XM2R-04N4-005			4.0					9.52°	4.20	4.35	4.51	4.67	5.05				
XM2R-04N1-01		0.1	1.0					13.17°	1.06	1.11	1.16	1.21	1.31				
XM2R-04N2-01			2.0					11.7°	2.11	2.20	2.28	2.37	2.55				
XM2R-04N3-01			3.0					10.53°	3.16	3.28	3.39	3.52	3.79				
XM2R-04N4-01			4.0					9.56°	4.20	4.35	4.50	4.67	5.04				
XM2R-05N1-002	0.5	0.02	1.0	0.4	0.47	50.0	4.0	13°	1.06	1.12	1.17	1.23	1.33				
XM2R-05N2-002			2.0					11.53°	2.11	2.21	2.29	2.38	2.57				
XM2R-05N3-002			3.0					10.35°	3.16	3.28	3.40	3.53	3.81				
XM2R-05N4-002			4.0					9.39°	4.20	4.35	4.51	4.68	5.06				
XM2R-05N6-002			6.0					7.92°	6.27	6.49	6.73	6.98	7.54				
XM2R-05N1-005		0.05	1.0					13.05°	1.06	1.12	1.17	1.22	1.32				
XM2R-05N2-005			2.0					11.56°	2.11	2.21	2.29	2.37	2.56				
XM2R-05N3-005			3.0					10.38°	3.16	3.28	3.40	3.52	3.81				
XM2R-05N4-005		0.5	4.0					9.42°	4.20	4.35	4.51	4.67	5.05				
XM2R-05N5-005			5.0					8.62°	5.24	5.42	5.61	5.82	6.29				
XM2R-05N6-005			6.0					7.94°	6.27	6.49	6.72	6.97	7.53				
XM2R-05N1-01		0.1	1.0					13.13°	1.06	1.11	1.16	1.21	1.31				
XM2R-05N2-01			2.0					11.63°	2.11	2.20	2.28	2.37	2.55				
XM2R-05N3-01			3.0					10.44°	3.16	3.28	3.39	3.52	3.79				
XM2R-05N4-01			4.0					9.46°	4.20	4.35	4.50	4.67	5.04				
XM2R-05N5-01			5.0					8.65°	5.24	5.42	5.61	5.82	6.28				
XM2R-05N6-01			6.0					7.97°	6.27	6.49	6.72	6.97	7.52				
XM2R-06N2-002	0.6	0.02	2.0	0.48	0.57	50.0	4.0	11.24°	2.17	2.31	2.44	2.55	2.77				
XM2R-06N4-002			4.0					9.15°	4.29	4.51	4.69	4.86	5.26				
XM2R-06N6-002			6.0					7.71°	6.40	6.66	6.90	7.16	7.74				
XM2R-06N2-005		0.05	2.0					11.27°	2.17	2.31	2.43	2.55	2.76				
XM2R-06N4-005			4.0					9.18°	4.29	4.51	4.68	4.86	5.25				
XM2R-06N6-005			6.0					7.73°	6.40	6.66	6.90	7.16	7.74				
XM2R-06N8-005			8.0					6.68°	8.49	8.80	9.12	9.46	10.22				
XM2R-06N10-005			10.0					5.88°	10.57	10.94	11.33	11.76	12.71				
XM2R-06N2-01		0.1	2.0					11.34°	2.16	2.30	2.43	2.54	2.75				
XM2R-06N4-01			4.0					9.22°	4.29	4.50	4.68	4.85	5.24				
XM2R-06N6-01			6.0					7.76°	6.39	6.66	6.90	7.15	7.72				
XM2R-06N8-01			8.0					6.7°	8.48	8.80	9.11	9.45	10.21				
XM2R-06N10-01			10.0					5.89°	10.57	10.94	11.33	11.75	12.70				
XM2R-07N4-005	0.7	0.05	4.0	0.56	0.67	50.0	4.0	9.07°	4.29	4.51	4.68	4.86	5.25				
XM2R-07N6-005			6.0					7.62°	6.40	6.66	6.90	7.16	7.74				
XM2R-07N4-01		0.1	4.0					9.11°	4.29	4.50	4.68	4.85	5.24				
XM2R-07N6-01			6.0					7.65°	6.39	6.66	6.90	7.15	7.72				
XM2R-08N4-002	0.8	0.02	4.0	0.64	0.76	50.0	4.0	8.96°	4.27	4.47	4.65	4.82	5.21				
XM2R-08N6-002			6.0					7.51°	6.37	6.63	6.87	7.12	7.70				
XM2R-08N4-005		0.05	4.0					8.99°	4.27	4.47	4.65	4.82	5.21				
XM2R-08N6-005			6.0					7.52°	6.37	6.63	6.86	7.12	7.69				
XM2R-08N8-005			8.0					6.47°	8.45	8.76	9.08	9.42	10.18				
XM2R-08N12-005			12.0			55.0		5.05°	12.61	13.04	13.51	14.02	15.15				

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel 0.5°	1°	1.5°	2°	3°	ab 3 Stk. -5%	ab 5 Stk. -10%	ab 10 Stk. -15%	ab 20 Stk. -20%
XM2R-08N4-01	0.8	0.1	4.0	0.64	0.76	50.0	4.0	9.03°	4.26	4.47	4.64	4.81	5.19				
XM2R-08N6-01			6.0					7.55°	6.37	6.62	6.86	7.11	7.68				
XM2R-08N8-01			8.0					6.49°	8.45	8.76	9.07	9.41	10.17				
XM2R-08N12-01			12.0					5.06°	12.60	13.04	13.51	14.01	15.14				
XM2R-08N4-02		0.2	4.0					9.12°	4.26	4.46	4.63	4.80	5.17				
XM2R-08N6-02			6.0					7.62°	6.36	6.61	6.85	7.10	7.66				
XM2R-08N8-02			8.0					6.54°	8.45	8.75	9.06	9.40	10.14				
XM2R-08N12-02			12.0					5.09°	12.60	13.03	13.50	14.00	15.11				
XM2R-10N2-002	1.0	0.02	2.00	0.80	0.96	50.0	4.0	10.92°	2.15	2.28	2.40	2.52	2.73				
XM2R-10N4-002			4.00					8.72°	4.27	4.47	4.65	4.82	5.21				
XM2R-10N6-002			6.00					7.26°	6.37	6.63	6.87	7.12	7.70				
XM2R-10N8-002			8.00					6.22°	8.46	8.77	9.08	9.42	10.19				
XM2R-10N10-002			10.00					5.44°	10.53	10.91	11.30	11.72	12.67				
XM2R-10N12-002			12.00					4.83°	12.61	13.05	13.52	14.02	15.16				
XM2R-10N2-005		0.05	2.00					10.96°	2.15	2.28	2.40	2.51	2.72				
XM2R-10N3-005			3.00					9.73°	3.21	3.38	3.53	3.67	3.96				
XM2R-10N4-005			4.00					8.75°	4.27	4.47	4.65	4.82	5.21				
XM2R-10N5-005			5.00					7.95°	5.32	5.55	5.75	5.97	6.45				
XM2R-10N6-005			6.00					7.28°	6.37	6.63	6.86	7.12	7.69				
XM2R-10N8-005			8.00					6.23°	8.45	8.76	9.08	9.42	10.18				
XM2R-10N10-005			10.00					5.45°	10.53	10.90	11.30	11.72	12.67				
XM2R-10N12-005			12.00					4.84°	12.61	13.04	13.51	14.02	15.15				
XM2R-10N16-005			16.00					3.95°	16.74	17.32	17.95	18.62	20.12				
XM2R-10N20-005			20.00					3.34°	20.88	21.60	22.38	23.22	25.10				
XM2R-10N2-01		0.1	2.0					11.03°	2.14	2.27	2.39	2.50	2.71				
XM2R-10N3-01			3.0					9.79°	3.21	3.38	3.53	3.66	3.95				
XM2R-10N4-01			4.0					8.8°	4.26	4.47	4.64	4.81	5.19				
XM2R-10N5-01			5.0					7.99°	5.32	5.55	5.75	5.96	6.44				
XM2R-10N6-01			6.0					7.31°	6.37	6.62	6.86	7.11	7.68				
XM2R-10N8-01			8.0					6.25°	8.45	8.76	9.07	9.41	10.17				
XM2R-10N10-01			10.0					5.46°	10.53	10.90	11.29	11.71	12.65				
XM2R-10N12-01			12.0					4.85°	12.60	13.04	13.51	14.01	15.14				
XM2R-10N16-01			16.0					3.96°	16.74	17.32	17.94	18.61	20.11				
XM2R-10N20-01			20.0					3.35°	20.87	21.60	22.37	23.21	25.08				
XM2R-10N2-02		0.2	2.0					11.17°	2.14	2.26	2.38	2.48	2.68				
XM2R-10N3-02			3.0					9.9°	3.20	3.37	3.51	3.65	3.93				
XM2R-10N4-02			4.0					8.89°	4.26	4.46	4.63	4.80	5.17				
XM2R-10N5-02			5.0					8.06°	5.31	5.54	5.74	5.95	6.41				
XM2R-10N6-02			6.0					7.37°	6.36	6.61	6.85	7.10	7.66				
XM2R-10N8-02			8.0					6.3°	8.45	8.75	9.06	9.40	10.14				
XM2R-10N10-02			10.0					5.5°	10.53	10.89	11.28	11.70	12.63				
XM2R-10N12-02			12.0					4.88°	12.60	13.03	13.50	14.00	15.11				
XM2R-10N16-02			16.0			50.0	4.0	3.98°	16.74	17.31	17.93	18.59	20.09				
XM2R-10N20-02			20.0					3.36°	20.87	21.59	22.36	23.19	25.06				
XM2R-10N2-03		0.3	2.0	0.80	0.96			11.32°	2.13	2.25	2.36	2.47	2.66				
XM2R-10N3-03			3.0					10.01°	3.20	3.36	3.50	3.63	3.90				
XM2R-10N4-03			4.0					8.98°	4.25	4.45	4.62	4.78	5.15				
XM2R-10N5-03			5.0					8.14°	5.31	5.53	5.73	5.93	6.39				
XM2R-10N6-03			6.0					7.44°	6.36	6.61	6.84	7.08	7.63				
XM2R-10N8-03			8.0					6.35°	8.44	8.75	9.05	9.38	10.12				
XM2R-10N10-03			10.0					5.53°	10.52	10.89	11.27	11.68	12.60				
XM2R-10N12-03			12.0			55.0		4.9°	12.60	13.03	13.49	13.98	15.09				
XM2R-10N16-03			16.0			60.0	4.0	4°	16.73	17.30	17.92	18.58	20.06				
XM2R-10N20-03			20.0					3.37°	20.87	21.58	22.35	23.18	25.04				
XM2R-125N5-01	1.25	0.1	5.0	1.0	1.2	50.0	4.0	7.68°	5.30	5.52	5.72	5.93	6.40				
XM2R-125N10-01			10.0					5.17°	10.50	10.87	11.26	11.68	12.62				
XM2R-125N15-01			15.0			55.0		3.9°	15.68	16.22	16.80	17.43	18.83				
XM2R-125N20-01			20.0			60.0		3.13°	20.84	21.57	22.34	23.18	25.05				
XM2R-125N5-02		0.2	5.0			50.0		7.75°	5.29	5.51	5.71	5.91	6.38				
XM2R-125N10-02			10.0					5.21°	10.50	10.86	11.25	11.66	12.59				
XM2R-125N15-02			15.0			55.0		3.92°	15.67	16.21	16.79	17.41	18.81				
XM2R-125N20-02			20.0			60.0		3.14°	20.84	21.56	22.33	23.16	25.02				
XM2R-125N5-03		0.3	5.0			50.0		7.83°	5.29	5.50	5.70	5.90	6.35				
XM2R-125N10-03			10.0					5.24°	10.50	10.86	11.24	11.65	12.57				
XM2R-125N15-03			15.0			55.0		3.94°	15.67	16.20	16.78	17.40	18.78				
XM2R-125N20-03			20.0			60.0		3.15°	20.84	21.55	22.32	23.15	25.00				
XM2R-15N4-01	4.0	0.1	4.0	4.0	4.0	50.0	4.0	8.17°	4.23	4.42	4.58	4.75	5.13				
XM2R-15N6-01			6.0					6.66°	6.32	6.57	6.80	7.05	7.62				
XM2R-15N8-01			8.0					5.62°	8.41	8.71	9.02	9.35	10.10				
XM2R-15N12-01			12.0			55.0		4.28°	12.55	12.98	13.45	13.95	15.07				
XM2R-15N15-01			15.0					3.63°	15.65	16.19	16.77	17.40	18.80				
XM2R-15N20-01			20.0			60.0		2.9°	20.82	21.54	22.32	23.15	-				
XM2R-15N4-02		0.2	4.0			50.0		8.26°	4.23	4.41	4.57	4.74	5.10				
XM2R-15N6-02			6.0					6.72°	6.32	6.56	6.79	7.04	7.59				
XM2R-15N8-02			8.0					5.66°	8.40	8.70	9.01	9.34	10.08				
XM2R-15N12-02			12.0			55.0		4.31°	12.55	12.98	13.44	13.94	15.05				
XM2R-15N15-02			15.0					3.65°	15.65	16.19	16.76	17.38	18.78				
XM2R-15N20-02			20.0			60.0		2.91°	20.82	21.53	22.31	23.13	-				
XM2R-15N4-03		0.3	4.0			50.0		8.36°	4.22	4.40	4.56	4.72	5.08				
XM2R-15N6-03			6.0					6.78°	6.31	6.55	6.78	7.02	7.57				
XM2R-15N8-03			8.0					5.71°	8.40	8.69	8.99	9.32	10.05				
XM2R-15N12-03			12.0			55.0		4.33°	12.54	12.97	13.43	13.92	15.03				
XM2R-15N15-03			15.0					3.67°	15.64	16.18	16.75	17.37	18.76				
XM2R-15N20-03			20.0			60.0		2.92°	20.81	21.53	22.29	23.12	-				
XM2R-15N4-05		0.5	4.0			50.0		8.55°	4.21	4.39	4.54	4.69	5.03				
XM2R-15N6-05			6.0					6.91°	6.31	6.54	6.76	6.99	7.52				
XM2R-15N8-05			8.0					5.8°	8.39	8.68	8.97	9.29	10.00				
XM2R-15N12-05			12.0			55.0		4.39°	12.54	12.96	13.41	13.89	14.98				
XM2R-15N15-05			15.0					3.71°	15.64	16.17	16.73	17.34	18.71				
XM2R-15N20-05			20.0			60.0		2.95°	20.81	21.51	22.27	23.09	-				
XM2R-175N5-01	1.75	0.1	5.0	1.4	1.68	50.0	4.0	6.96°	5.26	5.47	5.67	5.88	6.35				
XM2R-175N10-01			10.0					4.53°	10.46	10.82	11.21	11.63	12.56				
XM2R-175N15-01			15.0			55.0		3.35°	15.63	16.17	16.75	17.38	18.78				
XM2R-175N20-01			20.0			60.0		2.66°	20.80	21.52	22.29	23.13	-				
XM2R-175N5-02		0.2	5.0			50.0		7.03°	5.26	5.47	5.66	5.86	6.32				

AB CHF 200.– 3% E-COMMERCE RABATT

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
									0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2R-175N10-02	1.75	0.2	10.0	1.40	1.68	50.0	4.0	4.56°	10.46	10.82	11.20	11.61	12.54				
XM2R-175N15-02			15.0			55.0		3.37°	15.63	16.16	16.74	17.36	18.75				
XM2R-175N20-02			20.0			60.0		2.67°	20.80	21.51	22.28	23.11	-				
XM2R-175N5-03		0.3	5.0			50.0		7.11°	5.25	5.46	5.65	5.85	6.30				
XM2R-175N10-03			10.0					4.59°	10.45	10.81	11.19	11.60	12.51				
XM2R-175N15-03			15.0			55.0		3.39°	15.62	16.16	16.73	17.35	18.73				
XM2R-175N20-03			20.0			60.0		2.69°	20.79	21.51	22.27	23.10	-				
XM2R-20N4-01	2.0	0.1	4.0	1.60	1.92	50.0	4.0	7.36°	4.21	4.38	4.54	4.71	5.08				
XM2R-20N6-01			6.0					5.86°	6.29	6.53	6.76	7.01	7.57				
XM2R-20N8-01			8.0					4.87°	8.37	8.66	8.97	9.31	10.05				
XM2R-20N12-01			12.0			55.0		3.64°	12.51	12.94	13.41	13.91	15.03				
XM2R-20N16-01			16.0					2.9°	16.65	17.22	17.84	18.51	-				
XM2R-20N20-01			20.0			60.0		2.42°	20.78	21.50	22.27	23.11	-				
XM2R-20N25-01			25.0			65.0		2°	25.95	26.85	27.82	-	-				
XM2R-20N30-01			30.0			70.0		1.7°	31.12	32.20	33.36	-	-				
XM2R-20N4-02		0.2	4.0			50.0		7.46°	4.20	4.37	4.53	4.69	5.06				
XM2R-20N6-02			6.0					5.93°	6.29	6.52	6.75	6.99	7.54				
XM2R-20N8-02			8.0					4.91°	8.37	8.66	8.96	9.29	10.03				
XM2R-20N12-02			12.0			55.0		3.66°	12.51	12.94	13.40	13.89	15.00				
XM2R-20N16-02			16.0					2.92°	16.64	17.22	17.83	18.49	-				
XM2R-20N20-02			20.0			60.0		2.43°	20.78	21.49	22.26	23.09	-				
XM2R-20N25-02			25.0			65.0		2°	25.95	26.84	27.80	-	-				
XM2R-20N30-02			30.0			70.0		1.71°	31.11	32.19	33.35	-	-				
XM2R-20N4-03		0.3	4.0			50.0		7.56°	4.20	4.37	4.52	4.68	5.03				
XM2R-20N6-03			6.0					5.99°	6.28	6.51	6.74	6.98	7.52				
XM2R-20N8-03			8.0					4.96°	8.36	8.65	8.95	9.28	10.01				
XM2R-20N12-03			12.0			55.0		3.69°	12.50	12.93	13.39	13.88	14.98				
XM2R-20N16-03			16.0					2.93°	16.64	17.21	17.82	18.48	-				
XM2R-20N20-03			20.0			60.0		2.44°	20.77	21.49	22.25	23.08	-				
XM2R-20N25-03			25.0			65.0		2.01°	25.94	26.84	27.79	28.82	-				
XM2R-20N30-03			30.0			70.0		1.71°	31.11	32.18	33.34	-	-				
XM2R-20N6-05		0.5	6.0			50.0		6.11°	6.28	6.50	6.71	6.95	7.47				
XM2R-20N8-05			8.0					5.04°	8.36	8.64	8.93	9.25	9.96				
XM2R-20N12-05			12.0			55.0		3.73°	12.50	12.92	13.36	13.85	14.93				
XM2R-20N16-05			16.0					2.96°	16.63	17.19	17.80	18.45	-				
XM2R-20N20-05			20.0			60.0		2.46°	20.77	21.47	22.23	23.05	-				
XM2R-20N25-05			25.0			65.0		2.03°	25.94	26.82	27.77	28.79	-				
XM2R-20N30-05			30.0			70.0		1.72°	31.10	32.17	33.31	-	-				
XM2R-20N6-08		0.8	6.0			50.0		6.31°	6.26	6.48	6.68	6.90	7.40				
XM2R-20N8-08			8.0					5.18°	8.35	8.62	8.90	9.20	9.88				
XM2R-20N12-08			12.0			55.0		3.81°	12.49	12.89	13.33	13.80	14.86				
XM2R-20N16-08			16.0			55.0		3.01°	16.62	17.17	17.77	18.40	19.83				
XM2R-20N20-08			20.0			60.0		2.49°	20.76	21.45	22.20	23.00	-				
XM2R-20N25-08			25.0			65.0		2.05°	25.93	26.80	27.74	28.75	-				
XM2R-20N30-08			30.0			70.0		1.74°	31.09	32.15	33.28	-	-				
XM2R-25N10-01	2.5	0.1	10.0	2.0	2.40	50.0	4.0	3.36°	10.41	10.77	11.16	11.57	12.50				
XM2R-25N20-01			20.0			60.0		1.89°	20.75	21.47	22.24	-	-				
XM2R-25N30-01			30.0			70.0		1.32°	31.09	32.17	-	-	-				
XM2R-25N10-02		0.2	10.0			50.0		3.39°	10.41	10.77	11.15	11.56	12.48				
XM2R-25N20-02			20.0			60.0		1.9°	20.75	21.46	22.23	-	-				
XM2R-25N30-02			30.0			70.0		1.32°	31.08	32.16	-	-	-				
XM2R-25N10-03		0.3	10.0			50.0		3.42°	10.41	10.76	11.14	11.54	12.46				
XM2R-25N20-03			20.0			60.0		1.91°	20.74	21.46	22.22	-	-				
XM2R-25N30-03			30.0			70.0		1.32°	31.08	32.15	-	-	-				
XM2R-25N10-05		0.5	10.0			50.0		3.47°	10.40	10.75	11.12	11.51	12.41				
XM2R-25N20-05			20.0			60.0		1.92°	20.74	21.44	22.20	-	-				
XM2R-25N30-05			30.0			70.0		1.33°	31.07	32.14	-	-	-				
XM2R-30N6-01	3.0	0.1	6.0	2.4	2.88	50.0	6.0	7.4°	6.25	6.47	6.70	6.95	7.50				
XM2R-30N8-01			8.0			55.0		6.32°	8.32	8.61	8.92	9.25	9.99				
XM2R-30N12-01			12.0			60.0		4.89°	12.46	12.89	13.35	13.85	14.96				
XM2R-30N16-01			16.0					3.99°	16.59	17.17	17.78	18.45	19.94				
XM2R-30N18-01			18.0			65.0		3.65°	18.66	19.31	20.00	20.75	22.42				
XM2R-30N20-01			20.0					3.36°	20.73	21.45	22.22	23.05	24.91				
XM2R-30N30-01			30.0			75.0		2.42°	31.06	32.14	33.30	34.55	-				
XM2R-30N35-01			35.0			80.0		2.12°	36.23	37.49	38.84	40.29	-				
XM2R-30N6-02		0.2	6.0			50.0		7.46°	6.25	6.46	6.69	6.93	7.48				
XM2R-30N8-02			8.0			55.0		6.36°	8.32	8.60	8.91	9.23	9.97				
XM2R-30N12-02			12.0			60.0		4.92°	12.45	12.88	13.34	13.83	14.94				
XM2R-30N16-02			16.0					4°	16.59	17.16	17.77	18.43	19.91				
XM2R-30N18-02			18.0			65.0		3.66°	18.66	19.30	19.99	20.73	22.40				
XM2R-30N20-02			20.0					3.38°	20.72	21.44	22.21	23.03	24.88				
XM2R-30N30-02			30.0			75.0		2.43°	31.06	32.14	33.29	34.53	-				
XM2R-30N35-02			35.0			80.0		2.13°	36.23	37.48	38.83	40.28	-				
XM2R-30N6-03		0.3	6.0			50.0		7.53°	6.24	6.46	6.68	6.92	7.46				
XM2R-30N8-03			8.0			55.0		6.41°	8.32	8.60	8.90	9.22	9.94				
XM2R-30N12-03			12.0			60.0		4.94°	12.45	12.87	13.33	13.82	14.91				
XM2R-30N16-03			16.0					4.02°	16.59	17.15	17.76	18.42	19.89				
XM2R-30N18-03			18.0			65.0		3.68°	18.65	19.29	19.98	20.72	22.37				
XM2R-30N20-03			20.0					3.39°	20.72	21.43	22.20	23.02	24.86				
XM2R-30N30-03			30.0			75.0		2.43°	31.06	32.13	33.28	34.52	-				
XM2R-30N35-03			35.0			80.0		2.13°	36.23	37.48	38.82	40.26	-				
XM2R-30N8-05		0.5	8.0			55.0		6.51°	8.31	8.58	8.87	9.19	9.89				
XM2R-30N12-05			12.0			60.0		5°	12.44	12.86	13.31	13.79	14.87				
XM2R-30N16-05			16.0					4.06°	16.58	17.14	17.74	18.39	19.84				
XM2R-30N18-05			18.0			65.0		3.71°	18.65	19.28	19.96	20.69	22.33				
XM2R-30N20-05			20.0					3.42°	20.71	21.42	22.17	22.99	24.81				
XM2R-30N30-05			30.0			75.0		2.45°	31.05	32.12	33.26	34.49	-				
XM2R-30N35-05			35.0			80.0		2.14°	36.22	37.46	38.80	40.23	-				
XM2R-30N8-10		1.0	8.0			55.0		6.76°	8.29	8.55	8.82	9.11	9.77				
XM2R-30N12-10			12.0			60.0		5.15°	12.43	12.83	13.25	13.71	14.74				
XM2R-30N16-10			16.0					4.16°	16.56	17.10	17.69	18.31	19.72				
XM2R-30N18-10			18.0			65.0		3.79°	18.63	19.24	19.90	20.61	22.20				
XM2R-30N20-10			20.0					3.49°	20.70	21.38	22.12	22.91	24.69				
XM2R-30N30-10			30.0			75.0		2.48°	31.03	32.08	33.20	34.41	-				
XM2R-30N35-10			35.0			80.0		2.17°	36.20	37.43	38.74	40.16	-				

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
									0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2R-40N8-01	4.0	0.1	8.0	3.2	3.86	55.0	6.0	4.9°	8.31	8.59	8.90	9.23	9.97				
XM2R-40N12-01			12.0			60.0		3.66°	12.44	12.87	13.33	13.83	14.94				
XM2R-40N16-01			16.0					2.91°	16.57	17.15	17.76	18.43	-				
XM2R-40N20-01			20.0			65.0		2.42°	20.71	21.43	22.20	23.03	-				
XM2R-40N30-01			30.0			75.0		1.71°	31.05	32.12	33.28	-	-				
XM2R-40N35-01			35.0			80.0		1.49°	36.21	37.47	-	-	-				
XM2R-40N45-01			45.0			90.0		1.18°	46.55	48.17	-	-	-				
XM2R-40N8-02		0.2	8.0			55.0		4.94°	8.30	8.58	8.89	9.21	9.94				
XM2R-40N12-02			12.0			60.0		3.68°	12.44	12.86	13.32	13.81	14.92				
XM2R-40N16-02			16.0					2.93°	16.57	17.14	17.75	18.41	-				
XM2R-40N20-02			20.0			65.0		2.43°	20.71	21.42	22.19	23.01	-				
XM2R-40N30-02			30.0			75.0		1.71°	31.04	32.12	33.27	-	-				
XM2R-40N35-02		0.2	35.0			80.0		1.49°	36.21	37.47	-	-	-				
XM2R-40N45-02			45.0			90.0		1.18°	46.55	48.16	-	-	-				
XM2R-40N8-03		0.3	8.0			55.0		4.99°	8.30	8.58	8.88	9.20	9.92				
XM2R-40N12-03			12.0			60.0		3.7°	12.43	12.86	13.31	13.80	14.89				
XM2R-40N16-03			16.0					2.94°	16.57	17.13	17.74	18.40	-				
XM2R-40N20-03			20.0			65.0		2.44°	20.70	21.41	22.18	23.00	-				
XM2R-40N30-03			30.0			75.0		1.72°	31.04	32.11	33.26	-	-				
XM2R-40N35-03			35.0			80.0		1.49°	36.21	37.46	-	-	-				
XM2R-40N45-03			45.0			90.0		1.19°	46.54	48.16	-	-	-				
XM2R-40N12-05		0.5	12.0			60.0		3.75°	12.43	12.84	13.29	13.77	14.84				
XM2R-40N16-05			16.0					2.97°	16.56	17.12	17.72	18.37	-				
XM2R-40N20-05			20.0			65.0		2.47°	20.70	21.40	22.15	22.97	-				
XM2R-40N30-05			30.0			75.0		1.73°	31.03	32.10	33.24	-	-				
XM2R-40N35-05			35.0			80.0		1.5°	36.20	37.44	-	-	-				
XM2R-40N45-05			45.0			90.0		1.19°	46.54	48.14	-	-	-				
XM2R-40N12-10		1.0	12.0			60.0		3.88°	12.41	12.81	13.23	13.69	14.72				
XM2R-40N16-10			16.0					3.05°	16.54	17.09	17.67	18.29	19.70				
XM2R-40N20-10			20.0			65.0		2.52°	20.68	21.36	22.10	22.89	-				
XM2R-40N30-10			30.0			75.0		1.75°	31.02	32.06	33.18	-	-				
XM2R-40N35-10			35.0			80.0		1.52°	36.18	37.41	38.73	-	-				
XM2R-40N45-10			45.0			90.0		1.2°	46.52	48.11	-	-	-				
XM2R-50N20-01	5.0	0.1	20.0	4.0	4.85	65.0	6.0	1.32°	20.7	21.42	-	-	-				
XM2R-50N40-01			40.0			85.0		0.69°	41.38	-	-	-	-				
XM2R-50N20-02		0.2	20.0			65.0		1.32°	20.7	21.41	-	-	-				
XM2R-50N40-02			40.0			85.0		0.69°	41.37	-	-	-	-				
XM2R-50N20-03		0.3	20.0			65.0		1.33°	20.69	21.41	-	-	-				
XM2R-50N40-03			40.0			85.0		0.69°	41.37	-	-	-	-				
XM2R-50N20-05		0.5	20.0			65.0		1.34°	20.69	21.39	-	-	-				
XM2R-50N40-05			40.0			85.0		0.7°	41.36	-	-	-	-				
XM2R-50N20-10		1.0	20.0			65.0		1.38°	20.67	21.36	-	-	-				
XM2R-50N40-10			40.0			85.0		0.71°	41.35	-	-	-	-				
XM2R-60N12-01	6.0	0.1	12.0	4.8	5.85	50.0	6.0	-	-	-	-	-	-				
XM2R-60N18-01			18.0			60.0		-	-	-	-	-	-				
XM2R-60N24-01			24.0			70.0		-	-	-	-	-	-				
XM2R-60N35-01			35.0			80.0		-	-	-	-	-	-				
XM2R-60N55-01			55.0			100.0		-	-	-	-	-	-				
XM2R-60N12-02		0.2	12.0			50.0		-	-	-	-	-	-				
XM2R-60N18-02			18.0			60.0		-	-	-	-	-	-				
XM2R-60N24-02			24.0			70.0		-	-	-	-	-	-				
XM2R-60N35-02			35.0			80.0		-	-	-	-	-	-				
XM2R-60N55-02			55.0			100.0		-	-	-	-	-	-				
XM2R-60N12-03		0.3	12.0			50.0		-	-	-	-	-	-				
XM2R-60N18-03			18.0			60.0		-	-	-	-	-	-				
XM2R-60N24-03			24.0			70.0		-	-	-	-	-	-				
XM2R-60N35-03			35.0			80.0		-	-	-	-	-	-				
XM2R-60N55-03			55.0			100.0		-	-	-	-	-	-				
XM2R-60N18-05		0.5	18.0			60.0		-	-	-	-	-	-				
XM2R-60N24-05			24.0			70.0		-	-	-	-	-	-				
XM2R-60N35-05			35.0			80.0		-	-	-	-	-	-				
XM2R-60N55-05			55.0			100.0		-	-	-	-	-	-				
XM2R-60N18-10		1.0	18.0			60.0		-	-	-	-	-	-				
XM2R-60N24-10			24.0			70.0		-	-	-	-	-	-				
XM2R-60N35-10			35.0			80.0		-	-	-	-	-	-				
XM2R-60N55-10			55.0			100.0		-	-	-	-	-	-				

XM4R Serie

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Z4 | ALtima® Xtreme | <60 HRC | bis zu 20D | ± 0,005

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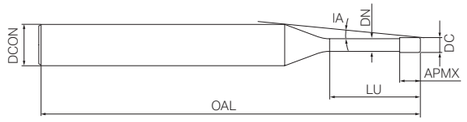

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel 0.5°	1°	1.5°	2°	3°	ab 3 Stk. -5%	ab 5 Stk. -10%	ab 10 Stk. -15%	ab 20 Stk. -20%
XM4R-10N4-005	1.0	0.05	4.0	0.8	0.96	50.0	4.0	8.75°	4.27	4.47	4.65	4.82	5.21				
XM4R-10N6-005			6.0					7.28°	6.37	6.63	6.86	7.12	7.69				
XM4R-10N8-005			8.0					6.23°	8.45	8.76	9.08	9.42	10.18				
XM4R-10N10-005			10.0					5.45°	10.53	10.90	11.30	11.72	12.67				
XM4R-10N12-005			12.0			60.0		4.84°	12.61	13.04	13.51	14.02	15.15				
XM4R-10N16-005			16.0					3.95°	16.74	17.32	17.95	18.62	20.12				
XM4R-10N20-005			20.0					3.34°	20.88	21.60	22.38	23.22	25.10				
XM4R-10N4-01		0.1	4.0			50.0		8.8°	4.26	4.47	4.64	4.81	5.19				
XM4R-10N6-01			6.0					7.31°	6.37	6.62	6.86	7.11	7.68				
XM4R-10N8-01			8.0					6.25°	8.45	8.76	9.07	9.41	10.17				
XM4R-10N10-01			10.0					5.46°	10.53	10.90	11.29	11.71	12.65				
XM4R-10N12-01			12.0			60.0		4.85°	12.60	13.04	13.51	14.01	15.14				
XM4R-10N16-01			16.0					3.96°	16.74	17.32	17.94	18.61	20.11				
XM4R-10N20-01			20.0					3.35°	20.87	21.60	22.37	23.21	25.08				
XM4R-15N4-005	1.5	0.05	4.0	1.2	1.44	50.0	4.0	8.12°	4.23	4.42	4.59	4.76	5.14				
XM4R-15N8-005			8.0					5.6°	8.41	8.71	9.02	9.36	10.11				
XM4R-15N12-005			12.0			60.0		4.27°	12.55	12.99	13.46	13.96	15.09				
XM4R-15N15-005			15.0					3.62°	15.65	16.20	16.78	17.41	18.82				
XM4R-15N20-005			20.0					2.89°	20.82	21.55	22.32	23.16	-				
XM4R-15N4-01		0.1	4.0			50.0		8.17°	4.23	4.42	4.58	4.75	5.13				
XM4R-15N8-01			8.0					5.62°	8.41	8.71	9.02	9.35	10.10				
XM4R-15N12-01			12.0			60.0		4.28°	12.55	12.98	13.45	13.95	15.07				
XM4R-15N15-01			15.0					3.63°	15.65	16.19	16.77	17.40	18.80				
XM4R-15N20-01			20.0					2.9°	20.82	21.54	22.32	23.15	-				
XM4R-20N4-005	2.0	0.05	4.0	1.6	1.92	50.0	4.0	8.75°	4.27	4.47	4.65	4.82	5.21				
XM4R-20N6-005			6.0					7.28°	6.37	6.63	6.86	7.12	7.69				
XM4R-20N8-005			8.0					6.23°	8.45	8.76	9.08	9.42	10.18				
XM4R-20N12-005			12.0			60.0		5.45°	10.53	10.90	11.30	11.72	12.67				
XM4R-20N16-005			16.0					4.84°	12.61	13.04	13.51	14.02	15.15				
XM4R-20N20-005			20.0					3.95°	16.74	17.32	17.95	18.62	20.12				
XM4R-20N4-01		0.1	4.0			50.0		3.34°	20.88	21.60	22.38	23.22	25.10				
XM4R-20N6-01			6.0					8.8°	4.26	4.47	4.64	4.81	5.19				
XM4R-20N8-01			8.0					7.31°	6.37	6.62	6.86	7.11	7.68				
XM4R-20N12-01			12.0			60.0		6.25°	8.45	8.76	9.07	9.41	10.17				
XM4R-20N16-01			16.0					5.46°	10.53	10.90	11.29	11.71	12.65				
XM4R-20N20-01			20.0					4.85°	12.60	13.04	13.51	14.01	15.14				
XM4R-20N4-02		0.2	4.0			50.0		3.96°	16.74	17.32	17.94	18.61	20.11				
XM4R-20N6-02			6.0					3.35°	20.87	21.60	22.37	23.21	25.08				
XM4R-20N8-02			8.0					8.12°	4.23	4.42	4.59	4.76	5.14				
XM4R-20N12-02			12.0			60.0		5.6°	8.41	8.71	9.02	9.36	10.11				
XM4R-20N16-02			16.0					4.27°	12.55	12.99	13.46	13.96	15.09				
XM4R-20N20-02			20.0					3.62°	15.65	16.20	16.78	17.41	18.82				
XM4R-20N25-02			25.0			70.0		2.89°	20.82	21.55	22.32	23.16	-				
XM4R-20N30-02			30.0					8.17°	4.23	4.42	4.58	4.75	5.13				
XM4R-20N4-03		0.3	4.0			50.0		5.62°	8.41	8.71	9.02	9.35	10.10				
XM4R-20N8-03			8.0					4.28°	12.55	12.98	13.45	13.95	15.07				
XM4R-20N12-03	2.0	0.3	12.0	1.6	1.92	60.0	4.0	3.63°	15.65	16.19	16.77	17.40	18.80				
XM4R-20N16-03			16.0					2.9°	20.82	21.54	22.32	23.15	-				
XM4R-20N20-03			20.0					2.44°	20.77	21.49	22.25	23.08	-				
XM4R-20N4-05		0.5	4.0			50.0		7.76°	4.19	4.35	4.50	4.65	4.98				
XM4R-20N6-05			6.0					6.11°	6.28	6.50	6.71	6.95	7.47				
XM4R-20N8-05			8.0					5.04°	8.36	8.64	8.93	9.25	9.96				
XM4R-20N12-05			12.0					3.73°	12.50	12.92	13.36	13.85	14.93				
XM4R-20N16-05			16.0			60.0		2.96°	16.63	17.19	17.80	18.45	-				
XM4R-20N20-05			20.0					2.46°	20.77	21.47	22.23	23.05	-				
XM4R-20N25-05			25.0					2.03°	25.94	26.82	27.77	28.79	-				
XM4R-20N30-05			30.0			50.0		1.72°	31.10	32.17	33.31	-	-				
XM4R-25N8-01	2.50	0.10	8.0	2.0	2.4	50.0	4.0	3.98°	8.34	8.63	8.94	9.27	10.02				
XM4R-25N16-01			16.0					2.29°	16.62	17.19	17.81	18.47	-				
XM4R-25N20-01			20.0					1.89°	20.75	21.47	22.24	-	-				
XM4R-25N8-02		0.20	8.0			60.0		4.02°	8.34	8.63	8.93	9.26	9.99				
XM4R-25N16-02			16.0					2.3°	16.61	17.18	17.80	18.46	-				
XM4R-25N20-02			20.0					1.9°	20.75	21.46	22.23	-	-				
XM4R-25N12-03		0.30	12.0			50.0		2.95°	12.47	12.90	13.35	13.84	-				
XM4R-25N20-03			20.0					1.91°	20.74	21.46	22.22	-	-				
XM4R-25N12-05		0.50	12.0			60.0		2.99°	12.47	12.88	13.33	13.81	-				
XM4R-25N20-05			20.0					1.92°	20.74	21.44	22.20	-	-				

Art. Nr.	DC	RE	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel 0.5°	1°	1.5°	2°	3°	ab 3 Stk. -5%	ab 5 Stk. -10%	ab 10 Stk. -15%	ab 20 Stk. -20%
XM4R-30N8-01	3.0	0.1	8.0	2.44	2.88	50.0	6.0	6.32°	8.32	8.61	8.92	9.25	9.99				
XM4R-30N16-01			16.0					3.99°	16.59	17.17	17.78	18.45	19.94				
XM4R-30N25-01			25.0					2.82°	25.90	26.79	27.76	28.80	-				
XM4R-30N30-01			30.0			60.0		2.42°	31.06	32.14	33.30	34.55	-				
XM4R-30N8-02		0.2	8.0			50.0		6.36°	8.32	8.60	8.91	9.23	9.97				
XM4R-30N12-02			12.0			60.0		4.92°	12.45	12.88	13.34	13.83	14.94				
XM4R-30N16-02			16.0					4°	16.59	17.16	17.77	18.43	19.91				
XM4R-30N20-02			20.0			70.0		3.38°	20.72	21.44	22.21	23.03	24.88				
XM4R-30N25-02			25.0					2.82°	25.89	26.79	27.75	28.78	-				
XM4R-30N30-02			30.0			80.0		2.43°	31.06	32.14	33.29	34.53	-				
XM4R-30N8-03		0.3	8.0			60.0		6.41°	8.32	8.60	8.90	9.22	9.94				
XM4R-30N16-03			16.0					4.02°	16.59	17.15	17.76	18.42	19.89				
XM4R-30N20-03			20.0			70.0		3.39°	20.72	21.43	22.20	23.02	24.86				
XM4R-30N25-03			25.0					2.83°	25.89	26.78	27.74	28.77	-				
XM4R-30N30-03			30.0			80.0		2.43°	31.06	32.13	33.28	34.52	-				
XM4R-30N8-05		0.5	8.0			60.0		6.51°	8.31	8.58	8.87	9.19	9.89				
XM4R-30N12-05			12.0					5°	12.44	12.86	13.31	13.79	14.87				
XM4R-30N16-05			16.0					4.06°	16.58	17.14	17.74	18.39	19.84				
XM4R-30N20-05			20.0			70.0		3.42°	20.71	21.42	22.17	22.99	24.81				
XM4R-30N25-05			25.0					2.85°	25.88	26.77	27.72	28.74	-				
XM4R-30N30-05			30.0			80.0		2.45°	31.05	32.12	33.26	34.49	-				
XM4R-30N35-05			35.0					2.14°	36.22	37.46	38.80	40.23	-				
XM4R-40N12-01	4.0	0.1	12.0	3.2	3.86	60.0	6.0	3.66°	12.44	12.87	13.33	13.83	14.94				
XM4R-40N20-01			20.0					2.42°	20.71	21.43	22.20	23.03	-				
XM4R-40N30-01			30.0			80.0		1.71°	31.05	32.12	33.28	-	-				
XM4R-40N40-01			40.0					1.32°	41.38	42.82	-	-	-				
XM4R-40N12-02		0.2	12.0			60.0		3.68°	12.44	12.86	13.32	13.81	14.92				
XM4R-40N20-02			20.0					2.43°	20.71	21.42	22.19	23.01	-				
XM4R-40N30-02			30.0			80.0		1.71°	31.04	32.12	33.27	-	-				
XM4R-40N40-02			40.0					1.32°	41.38	42.81	-	-	-				
XM4R-40N12-03		0.3	12.0			60.0		3.7°	12.43	12.86	13.31	13.80	14.89				
XM4R-40N20-03			20.0					2.44°	20.70	21.41	22.18	23.00	-				
XM4R-40N30-03			30.0			80.0		1.72°	31.04	32.11	33.26	-	-				
XM4R-40N40-03			40.0					1.32°	41.38	42.81	-	-	-				
XM4R-40N12-05		0.5	12.0			60.0		3.75°	12.43	12.84	13.29	13.77	14.84				
XM4R-40N20-05			20.0			60.0		2.47°	20.70	21.40	22.15	22.97	-				
XM4R-40N30-05			30.0			80.0		1.73°	31.03	32.10	33.24	-	-				
XM4R-40N40-05			40.0					1.33°	41.37	42.79	-	-	-				
XM4R-50N20-01	5.0	0.1	20.0	4.0	4.85	70.0	6.0	1.32°	20.70	21.42	-	-	-				
XM4R-50N40-01			40.0			90.0		0.69°	41.38	-	-	-	-				
XM4R-50N20-02		0.2	20.0			70.0		1.32°	20.70	21.41	-	-	-				
XM4R-50N40-02			40.0			90.0		0.69°	41.37	-	-	-	-				
XM4R-50N20-03		0.3	20.0			70.0		1.33°	20.69	21.41	-	-	-				
XM4R-50N40-03			40.0			90.0		0.69°	41.37	-	-	-	-				
XM4R-50N20-05		0.5	20.0			70.0		1.34°	20.69	21.39	-	-	-				
XM4R-50N40-05			40.0			90.0		0.7°	41.36	-	-	-	-				
XM4R-50N20-10		1.0	20.0			70.0		1.38°	20.67	21.36	-	-	-				
XM4R-50N40-10			40.0			90.0		0.71°	41.34	-	-	-	-				
XM4R-60N30-02	6.0	0.2	30.0	4.8	5.85	80.0	6.0	-	-	-	-	-	-				
XM4R-60N54-02			54.0			100.0		-	-	-	-	-	-				
XM4R-60N72-02			72.0			120.0		-	-	-	-	-	-				
XM4R-60N30-03		0.3	30.0			80.0		-	-	-	-	-	-				
XM4R-60N54-03			54.0			100.0		-	-	-	-	-	-				
XM4R-60N72-03			72.0			120.0		-	-	-	-	-	-				
XM4R-60N30-05		0.5	30.0			80.0		-	-	-	-	-	-				
XM4R-60N54-05			54.0			100.0		-	-	-	-	-	-				
XM4R-60N72-05			72.0			120.0		-	-	-	-	-	-				
XM4R-60N30-10		1.0	30.0			80.0		-	-	-	-	-	-				
XM4R-60N54-10			54.0			100.0		-	-	-	-	-	-				
XM4R-60N72-10			72.0			120.0		-	-	-	-	-	-				

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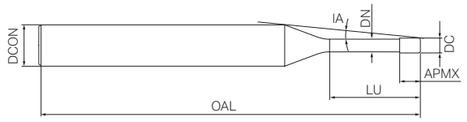

Art. Nr.	DC	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
								0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2S-01N0.3X		0.3					14.39°	0.31	0.33	0.35	0.37	0.40				
XM2S-01N0.5X	0.1	0.5	0.15	0.08	50.0	4.0	14.03°	0.52	0.55	0.58	0.60	0.65				
XM2S-01N1X		1.0					13.22°	1.05	1.09	1.13	1.18	1.27				
XM2S-02N0.5X		0.5					14.03°	0.52	0.54	0.57	0.59	0.64				
XM2S-02N1X		1.0					13.2°	1.04	1.08	1.12	1.16	1.26				
XM2S-02N1.5X	0.2	1.5	0.3	0.17	50.0	4.0	12.45°	1.56	1.62	1.67	1.74	1.88				
XM2S-02N2X		2.0					11.79°	2.08	2.15	2.23	2.31	2.50				
XM2S-02N3X		3.0					10.65°	3.11	3.22	3.34	3.46	3.74				
XM2S-03N1X		1.0					13.06°	1.06	1.12	1.18	1.23	1.33				
XM2S-03N1.5X		1.5					12.31°	1.59	1.67	1.74	1.81	1.95				
XM2S-03N2X	0.3	2.0	0.45	0.27	50.0	4.0	11.65°	2.12	2.21	2.29	2.38	2.57				
XM2S-03N2.5X		2.5					11.05°	2.64	2.75	2.85	2.96	3.20				
XM2S-03N3X		3.0					10.51°	3.16	3.28	3.40	3.53	3.82				
XM2S-04N1X		1.0					13.01°	1.06	1.12	1.18	1.23	1.33				
XM2S-04N1.5X		1.5					12.25°	1.59	1.67	1.74	1.81	1.95				
XM2S-04N2X		2.0					11.57°	2.12	2.21	2.29	2.38	2.57				
XM2S-04N2.5X		2.5					10.97°	2.64	2.75	2.85	2.96	3.20				
XM2S-04N3X		3.0					10.42°	3.16	3.28	3.40	3.53	3.82				
XM2S-04N3.5X	0.4	3.5	0.6	0.37	50.0	4.0	9.92°	3.68	3.82	3.96	4.11	4.44				
XM2S-04N4X		4.0					9.47°	4.20	4.35	4.51	4.68	5.06				
XM2S-04N5X		5.0					8.68°	5.24	5.42	5.62	5.83	6.30				
XM2S-04N6X		6.0					8.01°	6.27	6.49	6.73	6.98	7.55				
XM2S-04N8X		8.0					6.94°	8.34	8.63	8.94	9.28	10.03				
XM2S-04N10X		10.0					6.12°	10.41	10.77	11.16	11.58	12.52				
XM2S-05N1X		1.0					12.96°	1.06	1.12	1.18	1.23	1.33				
XM2S-05N1.5X		1.5					12.19°	1.59	1.67	1.74	1.81	1.95				
XM2S-05N2X		2.0					11.5°	2.12	2.21	2.29	2.38	2.57				
XM2S-05N2.5X		2.5					10.88°	2.64	2.75	2.85	2.96	3.20				
XM2S-05N3X	0.5	3.0	0.75	0.47	50.0	4.0	10.33°	3.16	3.28	3.40	3.53	3.82				
XM2S-05N4X		4.0					9.37°	4.20	4.35	4.51	4.68	5.06				
XM2S-05N5X		5.0					8.58°	5.24	5.42	5.62	5.83	6.30				
XM2S-05N6X		6.0					7.91°	6.27	6.49	6.73	6.98	7.55				
XM2S-05N8X		8.0					6.84°	8.34	8.63	8.94	9.28	10.03				
XM2S-05N10X		10.0					6.02°	10.41	10.77	11.16	11.58	12.52				
XM2S-06N2X		2.0					11.21°	2.17	2.31	2.44	2.56	2.78				
XM2S-06N3X		3.0					10.07°	3.24	3.42	3.58	3.72	4.02				
XM2S-06N4X		4.0					9.13°	4.30	4.51	4.69	4.87	5.26				
XM2S-06N5X		5.0					8.36°	5.35	5.59	5.80	6.02	6.50				
XM2S-06N6X	0.6	6.0	0.9	0.57	50.0	4.0	14.39°	0.31	0.33	0.35	0.37	0.40				
XM2S-06N7X		7.0					14.03°	0.52	0.55	0.58	0.60	0.65				
XM2S-06N8X		8.0					13.22°	1.05	1.09	1.13	1.18	1.27				
XM2S-06N9X		9.0					14.03°	0.52	0.54	0.57	0.59	0.64				
XM2S-06N10X		10.0					13.2°	1.04	1.08	1.12	1.16	1.26				
XM2S-07N2X		2.0					12.45°	1.56	1.62	1.67	1.74	1.88				
XM2S-07N4X		4.0					11.79°	2.08	2.15	2.23	2.31	2.50				
XM2S-07N6X	0.7	6.0	1.05	0.67	50.0	4.0	10.65°	3.11	3.22	3.34	3.46	3.74				
XM2S-07N8X		8.0					13.06°	1.06	1.12	1.18	1.23	1.33				
XM2S-07N10X		10.0					12.31°	1.59	1.67	1.74	1.81	1.95				
XM2S-08N4X		4.0					11.65°	2.12	2.21	2.29	2.38	2.57				
XM2S-08N6X		6.0			50.0		11.05°	2.64	2.75	2.85	2.96	3.20				
XM2S-08N8X	0.8	8.0	1.20	0.76		4.0	10.51°	3.16	3.28	3.40	3.53	3.82				
XM2S-08N10X		10.0					13.01°	1.06	1.12	1.18	1.23	1.33				
XM2S-08N12X		12.0			55.0		12.25°	1.59	1.67	1.74	1.81	1.95				
XM2S-09N6X		6.0					11.57°	2.12	2.21	2.29	2.38	2.57				
XM2S-09N8X	0.9	8.0	1.35	0.86	50.0	4.0	10.97°	2.64	2.75	2.85	2.96	3.20				
XM2S-09N10X		10.0					10.42°	3.16	3.28	3.40	3.53	3.82				
XM2S-09N12X		12.0			55.0		9.92°	3.68	3.82	3.96	4.11	4.44				
XM2S-10N2X		2.0					9.47°	4.20	4.35	4.51	4.68	5.06				
XM2S-10N3X		3.0					8.68°	5.24	5.42	5.62	5.83	6.30				
XM2S-10N4X		4.0					8.01°	6.27	6.49	6.73	6.98	7.55				
XM2S-10N5X		5.0					6.94°	8.34	8.63	8.94	9.28	10.03				
XM2S-10N6X		6.0			50.0		6.12°	10.41	10.77	11.16	11.58	12.52				
XM2S-10N7X		7.0					12.96°	1.06	1.12	1.18	1.23	1.33				
XM2S-10N8X	1.0	8.0	1.5	0.96		4.0	12.19°	1.59	1.67	1.74	1.81	1.95				
XM2S-10N9X		9.0					11.5°	2.12	2.21	2.29	2.38	2.57				
XM2S-10N10X		10.0					10.88°	2.64	2.75	2.85	2.96	3.20				
XM2S-10N12X		12.0					10.33°	3.16	3.28	3.40	3.53	3.82				
XM2S-10N14X		14.0			55.0		9.37°	4.20	4.35	4.51	4.68	5.06				
XM2S-10N16X		16.0					8.58°	5.24	5.42	5.62	5.83	6.30				
XM2S-10N20X		20.0			60.0		7.91°	6.27	6.49	6.73	6.98	7.55				
XM2S-10N25X		25.0			65.0		-	8.34	8.63	8.94	9.28	10.03				

Art. Nr.	DC	LU	APMX	DN	OAL	DCON	Störungswinkel IA	Ist-Länge (LU) nach Schrägwinkel					ab 3 Stk.	ab 5 Stk.	ab 10 Stk.	ab 20 Stk.
								0.5°	1°	1.5°	2°	3°	-5%	-10%	-15%	-20%
XM2S-12N6X		6.0					14.39°	0.31	0.33	0.35	0.37	0.40				
XM2S-12N8X		8.0			50.0		14.03°	0.52	0.55	0.58	0.60	0.65				
XM2S-12N10X	1.2	10.0	1.8	1.15		4.0	13.22°	1.05	1.09	1.13	1.18	1.27				
XM2S-12N12X		12.0			55.0		14.03°	0.52	0.54	0.57	0.59	0.64				
XM2S-12N16X		16.0					13.2°	1.04	1.08	1.12	1.16	1.26				
XM2S-14N6X	1.4	6.0	2.1	1.34	50.0	4.0	12.45°	1.56	1.62	1.67	1.74	1.88				
XM2S-14N12X		12.0			55.0		11.79°	2.08	2.15	2.23	2.31	2.50				
XM2S-15N4X		4.0					10.65°	3.11	3.22	3.34	3.46	3.74				
XM2S-15N6X		6.0			50.0		13.06°	1.06	1.12	1.18	1.23	1.33				
XM2S-15N8X		8.0					12.31°	1.59	1.67	1.74	1.81	1.95				
XM2S-15N10X		10.0					11.65°	2.12	2.21	2.29	2.38	2.57				
XM2S-15N12X		12.0					11.05°	2.64	2.75	2.85	2.96	3.20				
XM2S-15N14X		14.0			55.0		10.51°	3.16	3.28	3.40	3.53	3.82				
XM2S-15N16X	1.5	16.0	2.25	1.44		4.0	13.01°	1.06	1.12	1.18	1.23	1.33				
XM2S-15N18X		18.0			60.0		4°	4.00	1.67	1.74	1.81	1.95				
XM2S-15N20X		20.0					11.57°	2.12	2.21	2.29	2.38	2.57				
XM2S-15N25X		25.0			65.0		10.97°	2.64	2.75	2.85	2.96	3.20				
XM2S-15N30X		30.0			70.0		10.42°	3.16	3.28	3.40	3.53	3.82				
XM2S-15N35X		35.0			75.0		9.92°	3.68	3.82	3.96	4.11	4.44				
XM2S-15N40X		40.0			80.0		9.47°	4.20	4.35	4.51	4.68	5.06				
XM2S-16N6X	1.6	6.0	2.4	1.54	50.0	4.0	8.68°	5.24	5.42	5.62	5.83	6.30				
XM2S-16N8X		8.0					8.01°	6.27	6.49	6.73	6.98	7.55				
XM2S-18N6X	1.8	6.0	2.7	1.73	50.0	4.0	6.94°	8.34	8.63	8.94	9.28	10.03				
XM2S-18N8X		8.0					6.12°	10.41	10.77	11.16	11.58	12.52				
XM2S-20N4X		4.0					12.96°	1.06	1.12	1.18	1.23	1.33				
XM2S-20N6X		6.0			50.0		12.19°	1.59	1.67	1.74	1.81	1.95				
XM2S-20N8X		8.0					11.5°	2.12	2.21	2.29	2.38	2.57				
XM2S-20N10X	2.0	10.0	3.0	1.92		4.0	10.88°	2.64	2.75	2.85	2.96	3.20				
XM2S-20N12X		12.0					10.33°	3.16	3.28	3.40	3.53	3.82				
XM2S-20N14X		14.0			55.0		9.37°	4.20	4.35	4.51	4.68	5.06				
XM2S-20N16X		16.0					8.58°	5.24	5.42	5.62	5.83	6.30				
XM2S-20N18X		18.0			60.0		7.91°	6.27	6.49	6.73	6.98	7.55				
XM2S-20N20X		20.0					6.84°	8.34	8.63	8.94	9.28	10.03				
XM2S-20N25X		25.0			65.0		6.02°	10.41	10.77	11.16	11.58	12.52				
XM2S-20N30X	2.0	30.0	3.0	1.92	70.0	4.0	11.21°	2.17	2.31	2.44	2.56	2.78				
XM2S-20N35X		35.0			75.0		10.07°	3.24	3.42	3.58	3.72	4.02				
XM2S-20N40X		40.0			80.0		9.13°	4.30	4.51	4.69	4.87	5.26				
XM2S-20N50X		50.0			90.0		8.36°	5.35	5.59	5.80	6.02	6.50				
XM2S-25N8X		8.0			50.0		14.39°	0.31	0.33	0.35	0.37	0.40				
XM2S-25N12X		12.0					14.03°	0.52	0.55	0.58	0.60	0.65				
XM2S-25N16X		16.0			55.0		13.22°	1.05	1.09	1.13	1.18	1.27				
XM2S-25N20X	2.5	20.0	3.75	2.4	60.0	4.0	14.03°	0.52	0.54	0.57	0.59	0.64				
XM2S-25N30X		30.0			70.0		13.2°	1.04	1.08	1.12	1.16	1.26				
XM2S-25N40X		40.0			80.0		12.45°	1.56	1.62	1.67	1.74	1.88				
XM2S-25N50X		50.0			90.0		11.79°	2.08	2.15	2.23	2.31	2.50				
XM2S-30N8X		8.0			55.0		10.65°	3.11	3.22	3.34	3.46	3.74				
XM2S-30N12X		12.0			60.0		13.06°	1.06	1.12	1.18	1.23	1.33				
XM2S-30N16X		16.0					12.31°	1.59	1.67	1.74	1.81	1.95				
XM2S-30N20X	3.0	20.0	4.5	2.88	65.0	6.0	11.65°	2.12	2.21	2.29	2.38	2.57				
XM2S-30N25X		25.00			70.0		11.05°	2.64	2.75	2.85	2.96	3.20				
XM2S-30N30X		30.00			75.0		10.51°	3.16	3.28	3.40	3.53	3.82				
XM2S-30N40X		40.00			90.0		13.01°	1.06	1.12	1.18	1.23	1.33				
XM2S-30N50X		50.00			100.0		4°	4.00	1.67	1.74	1.81	1.95				
XM2S-40N12X		12.0			60.0		11.57°	2.12	2.21	2.29	2.38	2.57				
XM2S-40N16X		16.0					10.97°	2.64	2.75	2.85	2.96	3.20				
XM2S-40N20X		20.0			70.0		10.42°	3.16	3.28	3.40	3.53	3.82				
XM2S-40N25X	4.0	25.0	6.0	3.86		6.0	9.92°	3.68	3.82	3.96	4.11	4.44				
XM2S-40N30X		30.0			80.0		9.47°	4.20	4.35	4.51	4.68	5.06				
XM2S-40N35X		35.0					8.68°	5.24	5.42	5.62	5.83	6.30				
XM2S-40N40X		40.0			90.0		8.01°	6.27	6.49	6.73	6.98	7.55				
XM2S-40N50X		50.0			100.0		6.94°	8.34	8.63	8.94	9.28	10.03				
XM2S-50N20X		20.0			70.0		6.12°	10.41	10.77	11.16	11.58	12.52				
XM2S-50N25X		25.0					12.96°	1.06	1.12	1.18	1.23	1.33				
XM2S-50N30X	5.0	30.0	7.5	4.85	80.0	6.0	12.19°	1.59	1.67	1.74	1.81	1.95				
XM2S-50N40X		40.0			90.0		11.5°	2.12	2.21	2.29	2.38	2.57				
XM2S-50N50X		50.0			100.0		10.88°	2.64	2.75	2.85	2.96	3.20				
XM2S-60N20X		20.0			70.0		10.33°	3.16	3.28	3.40	3.53	3.82				
XM2S-60N30X	6.0	30.0	9.0	5.85	80.0	6.0	9.37°	4.20	4.35	4.51	4.68	5.06				
XM2S-60N40X		40.0			90.0		8.58°	5.24	5.42	5.62	5.83	6.30				
XM2S-60N50X		50.0			100.0		7.91°	6.27	6.49	6.73	6.98	7.55				

AB CHF 200.– 3% E-COMMERCE RABATT

TuffCut® XM Series XM2B High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

3xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.100	0.30	155	0.0070	0.0105	0.0140	0.0175	0.0210
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.090	0.30	150	0.0064	0.0096	0.0128	0.0160	0.0192
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.090	0.30	150	0.0064	0.0096	0.0128	0.0160	0.0192
High Temp Alloys	S	●	x	x	2D/3D HSC	0.060	0.20	50	0.0050	0.0075	0.0100	0.0125	0.0150
Titanium Alloys	S	●	x	x	2D/3D HSC	0.065	0.25	130	0.0060	0.0090	0.0120	0.0150	0.0180
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.080	0.30	145	0.0064	0.0096	0.0128	0.0160	0.0192
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.065	0.30	135	0.0060	0.0090	0.0120	0.0150	0.0180
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.060	0.20	110	0.0050	0.0075	0.0100	0.0125	0.0150

3xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0245	0.0280	0.0350	0.0438	0.0525	0.0613	0.0700	0.0875	0.1050	0.1400	0.1750	0.2100
Die / Tool Steels	0.0224	0.0256	0.0320	0.0400	0.0480	0.0560	0.0640	0.0800	0.0960	0.1280	0.1600	0.1920
Austentic Stainless Steels	0.0224	0.0256	0.0320	0.0400	0.0480	0.0560	0.0640	0.0800	0.0960	0.1280	0.1600	0.1920
High Temp Alloys	0.0175	0.0200	0.0250	0.0313	0.0375	0.0438	0.0500	0.0625	0.0750	0.1000	0.1250	0.1500
Titanium Alloys	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
Pre-Hardened Steel 35-45 HRC	0.0224	0.0256	0.0320	0.0400	0.0480	0.0560	0.0640	0.0800	0.0960	0.1280	0.1600	0.1920
Hardened Steel 45-55 HRC	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
Hardened Steel 55-65 HRC	0.0175	0.0200	0.0250	0.0313	0.0375	0.0438	0.0500	0.0625	0.0750	0.1000	0.1250	0.1500

5xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	ADOC (Ap)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.060	0.18	135	0.0066	0.0099	0.0132	0.0165	0.0198
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.054	0.18	130	0.0060	0.0090	0.0120	0.0150	0.0180
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.054	0.18	130	0.0060	0.0090	0.0120	0.0150	0.0180
High Temp Alloys	S	●	x	x	2D/3D HSC	0.036	0.12	45	0.0048	0.0072	0.0096	0.0120	0.0144
Titanium Alloys	S	●	x	x	2D/3D HSC	0.039	0.15	115	0.0058	0.0087	0.0116	0.0145	0.0174
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.048	0.18	125	0.0060	0.0090	0.0120	0.0150	0.0180
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.039	0.18	115	0.0058	0.0087	0.0116	0.0145	0.0174
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.036	0.12	95	0.0048	0.0072	0.0096	0.0120	0.0144

5xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0231	0.0264	0.0330	0.0413	0.0495	0.0578	0.0660	0.0825	0.0990	0.13200	0.16500	0.19800
Die / Tool Steels	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.12000	0.15000	0.18000
Austentic Stainless Steels	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
High Temp Alloys	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440
Titanium Alloys	0.0203	0.0232	0.0290	0.0363	0.0435	0.0508	0.0580	0.0725	0.0870	0.1160	0.1450	0.1740
Pre-Hardened Steel 35-45 HRC	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
Hardened Steel 45-55 HRC	0.0203	0.0232	0.0290	0.0363	0.0435	0.0508	0.0580	0.0725	0.0870	0.1160	0.1450	0.1740
Hardened Steel 55-65 HRC	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440

8xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.040	0.12	120	0.0064	0.0096	0.0128	0.0160	0.0192
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.036	0.12	115	0.0060	0.0090	0.0120	0.0150	0.0180
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.036	0.12	115	0.0060	0.0090	0.0120	0.0150	0.0180
High Temp Alloys	S	●	x	x	2D/3D HSC	0.024	0.08	40	0.0046	0.0069	0.0092	0.0115	0.0138
Titanium Alloys	S	●	x	x	2D/3D HSC	0.026	0.10	100	0.0056	0.0084	0.0112	0.0140	0.0168
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.032	0.12	110	0.0060	0.0090	0.0120	0.0150	0.0180
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.026	0.12	105	0.0056	0.0084	0.0112	0.0140	0.0168
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.024	0.08	85	0.0046	0.0069	0.0092	0.0115	0.0138

8xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0224	0.0256	0.0320	0.0400	0.0480	0.0560	0.0640	0.0800	0.0960	0.12800	0.16000	0.19200
Die / Tool Steels	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.12000	0.15000	0.18000
Austentic Stainless Steels	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
High Temp Alloys	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.0920	0.1150	0.1380
Titanium Alloys	0.0196	0.0224	0.0280	0.0350	0.0420	0.0490	0.0560	0.0700	0.0840	0.1120	0.1400	0.1680
Pre-Hardened Steel 35-45 HRC	0.0210	0.0240	0.0300	0.0375	0.0450	0.0525	0.0600	0.0750	0.0900	0.1200	0.1500	0.1800
Hardened Steel 45-55 HRC	0.0196	0.0224	0.0280	0.0350	0.0420	0.0490	0.0560	0.0700	0.0840	0.1120	0.1400	0.1680
Hardened Steel 55-65 HRC	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.0920	0.1150	0.1380

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2B High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

10xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.025	0.08	120	0.0052	0.0078	0.0104	0.0130	0.0156
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.023	0.08	115	0.0048	0.0072	0.0096	0.0120	0.0144
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.023	0.08	115	0.0048	0.0072	0.0096	0.0120	0.0144
High Temp Alloys	S	●	x	x	2D/3D HSC	0.015	0.05	40	0.0038	0.0057	0.0076	0.0095	0.0114
Titanium Alloys	S	●	x	x	2D/3D HSC	0.016	0.06	100	0.0046	0.0069	0.0092	0.0115	0.0138
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.020	0.08	110	0.0048	0.0072	0.0096	0.0120	0.0144
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.016	0.08	105	0.0046	0.0069	0.0092	0.0115	0.0138
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.015	0.05	85	0.0038	0.0057	0.0076	0.0095	0.0114

10xD Neck Length

Workpiece Material Group	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	End Mill Diameter (mm)											
	fz - mm/tooth											
Medium Carbon Steels	0.0182	0.0208	0.0260	0.0325	0.0390	0.0455	0.0520	0.0650	0.0780	0.10400	0.13000	0.15600
Die / Tool Steels	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.09600	0.12000	0.14400
Austentic Stainless Steels	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440
High Temp Alloys	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Titanium Alloys	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.0920	0.1150	0.1380
Pre-Hardened Steel 35-45 HRC	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440
Hardened Steel 45-55 HRC	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.0920	0.1150	0.1380
Hardened Steel 55-65 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

12xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.025	0.08	90	0.0046	0.0069	0.0092	0.0115	0.0138
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.023	0.08	85	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.023	0.08	85	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.015	0.05	30	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.016	0.06	75	0.0040	0.0060	0.0080	0.0100	0.0120
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.020	0.08	80	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.016	0.08	75	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.015	0.05	65	0.0032	0.0048	0.0064	0.0080	0.0096

12xD Neck Length

Workpiece Material Group	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	End Mill Diameter (mm)											
	fz - mm/tooth											
Medium Carbon Steels	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.09200	0.11500	0.13800
Die / Tool Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.08400	0.10500	0.12600
Austentic Stainless Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Pre-Hardened Steel 35-45 HRC	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960

15xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.015	0.05	90	0.0042	0.0063	0.0084	0.0105	0.0126
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.014	0.05	85	0.0038	0.0057	0.0076	0.0095	0.0114
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.014	0.05	85	0.0038	0.0057	0.0076	0.0095	0.0114
High Temp Alloys	S	●	x	x	2D/3D HSC	0.009	0.03	30	0.0030	0.0045	0.0060	0.0075	0.0090
Titanium Alloys	S	●	x	x	2D/3D HSC	0.010	0.04	75	0.0036	0.0054	0.0072	0.0090	0.0108
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.012	0.05	80	0.0038	0.0057	0.0076	0.0095	0.0114
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.010	0.05	75	0.0036	0.0054	0.0072	0.0090	0.0108
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.009	0.03	65	0.0030	0.0045	0.0060	0.0075	0.0090

15xD Neck Length

Workpiece Material Group	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	End Mill Diameter (mm)											
	fz - mm/tooth											
Medium Carbon Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.08400	0.10500	0.12600
Die / Tool Steels	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.07600	0.09500	0.11400
Austentic Stainless Steels	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
High Temp Alloys	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
Titanium Alloys	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080
Pre-Hardened Steel 35-45 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Hardened Steel 45-55 HRC	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080
Hardened Steel 55-65 HRC	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2R & XM4R High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

3xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.2	0.3	0.4	0.5	0.6
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.050	0.45	130	0.0048	0.0072	0.0096	0.0120	0.0144
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.045	0.40	110	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.045	0.40	110	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.030	0.20	50	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.033	0.30	110	0.0037	0.0056	0.0074	0.0093	0.0111
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.040	0.35	105	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.033	0.30	95	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.030	0.20	90	0.0038	0.0057	0.0076	0.0095	0.0114

3xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm): 0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440
Die / Tool Steels	P	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Austentic Stainless Steels	M	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	S	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	S	0.0130	0.0148	0.0185	0.0231	0.0278	0.0324	0.0370	0.0463	0.0555	0.0740	0.0925	0.1110
Pre-Hardened Steel 35-45 HRC	H	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	H	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	H	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

5xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.2	0.3	0.4	0.5	0.6
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.030	0.45	105	0.0048	0.0072	0.0096	0.0120	0.0144
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.027	0.40	90	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.027	0.40	90	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.018	0.20	40	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.020	0.30	90	0.0038	0.0057	0.0076	0.0095	0.0114
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.024	0.35	85	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.020	0.30	80	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.018	0.20	75	0.0038	0.0057	0.0076	0.0095	0.0114

5xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm): 0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.09600	0.12000	0.14400
Die / Tool Steels	P	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.08400	0.10500	0.12600
Austentic Stainless Steels	M	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	S	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	S	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Pre-Hardened Steel 35-45 HRC	H	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	H	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	H	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

8xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.2	0.3	0.4	0.5	0.6
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.024	0.35	85	0.0048	0.0072	0.0096	0.0120	0.0144
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.022	0.30	75	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.022	0.30	75	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.014	0.15	35	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.016	0.25	75	0.0038	0.0057	0.0076	0.0095	0.0114
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.019	0.25	70	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.016	0.25	65	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.014	0.15	60	0.0038	0.0057	0.0076	0.0095	0.0114

8xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm): 0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.09600	0.12000	0.14400
Die / Tool Steels	P	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.08400	0.10500	0.12600
Austentic Stainless Steels	M	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	S	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	S	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Pre-Hardened Steel 35-45 HRC	H	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	H	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	H	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2R & XM4R High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

10xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.015	0.35	80	0.0048	0.0072	0.0096	0.0120	0.0144
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.014	0.30	70	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.014	0.30	70	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.009	0.15	30	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.010	0.25	70	0.0038	0.0057	0.0076	0.0095	0.0114
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.012	0.25	65	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.010	0.25	60	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.009	0.15	55	0.0038	0.0057	0.0076	0.0095	0.0114

10xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.09600	0.12000	0.14400
Die / Tool Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.08400	0.10500	0.12600
Austentic Stainless Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Pre-Hardened Steel 35-45 HRC	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

12xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.015	0.25	65	0.0040	0.0060	0.0080	0.0100	0.0120
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.014	0.25	55	0.0036	0.0054	0.0072	0.0090	0.0108
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.014	0.25	55	0.0036	0.0054	0.0072	0.0090	0.0108
High Temp Alloys	S	●	x	x	2D/3D HSC	0.009	0.10	25	0.0028	0.0042	0.0056	0.0070	0.0084
Titanium Alloys	S	●	x	x	2D/3D HSC	0.010	0.20	55	0.0032	0.0048	0.0064	0.0080	0.0096
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.012	0.20	55	0.0036	0.0054	0.0072	0.0090	0.0108
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.010	0.20	50	0.0034	0.0051	0.0068	0.0085	0.0102
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.009	0.10	45	0.0032	0.0048	0.0064	0.0080	0.0096

12xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.08000	0.10000	0.12000
Die / Tool Steels	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.07200	0.09000	0.10800
Austentic Stainless Steels	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080
High Temp Alloys	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840
Titanium Alloys	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Pre-Hardened Steel 35-45 HRC	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080
Hardened Steel 45-55 HRC	0.0119	0.0136	0.0170	0.0213	0.0255	0.0298	0.0340	0.0425	0.0510	0.0680	0.0850	0.1020
Hardened Steel 55-65 HRC	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960

15xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.009	0.25	65	0.0034	0.0051	0.0068	0.0085	0.0102
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.008	0.20	55	0.0030	0.0045	0.0060	0.0075	0.0090
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.008	0.20	55	0.0030	0.0045	0.0060	0.0075	0.0090
High Temp Alloys	S	●	x	x	2D/3D HSC	0.005	0.10	25	0.0022	0.0033	0.0044	0.0055	0.0066
Titanium Alloys	S	●	x	x	2D/3D HSC	0.006	0.15	55	0.0026	0.0039	0.0052	0.0065	0.0078
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.007	0.20	55	0.0030	0.0045	0.0060	0.0075	0.0090
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.006	0.15	50	0.0028	0.0042	0.0056	0.0070	0.0084
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.005	0.10	45	0.0026	0.0039	0.0052	0.0065	0.0078

15xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)											
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0119	0.0136	0.0170	0.0213	0.0255	0.0298	0.0340	0.0425	0.0510	0.06800	0.08500	0.10200
Die / Tool Steels	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.06000	0.07500	0.09000
Austentic Stainless Steels	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
High Temp Alloys	0.0077	0.0088	0.0110	0.0138	0.0165	0.0193	0.0220	0.0275	0.0330	0.0440	0.0550	0.0660
Titanium Alloys	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.0520	0.0650	0.0780
Pre-Hardened Steel 35-45 HRC	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
Hardened Steel 45-55 HRC	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840
Hardened Steel 55-65 HRC	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.0520	0.0650	0.0780

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2S High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

3xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.085	0.45	95	0.0048	0.0072	0.0096	0.0120	0.0144
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.077	0.40	85	0.0042	0.0063	0.0084	0.0105	0.0126
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.077	0.40	85	0.0042	0.0063	0.0084	0.0105	0.0126
High Temp Alloys	S	●	x	x	2D/3D HSC	0.034	0.20	50	0.0032	0.0048	0.0064	0.0080	0.0096
Titanium Alloys	S	●	x	x	2D/3D HSC	0.055	0.30	85	0.0037	0.0056	0.0074	0.0093	0.0111
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.060	0.35	80	0.0042	0.0063	0.0084	0.0105	0.0126
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.043	0.30	70	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.038	0.20	65	0.0038	0.0057	0.0076	0.0095	0.0114

3xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)										
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0168	0.0192	0.0240	0.0300	0.0360	0.0420	0.0480	0.0600	0.0720	0.0960	0.1200	0.1440
Die / Tool Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Austentic Stainless Steels	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
High Temp Alloys	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Titanium Alloys	0.0130	0.0148	0.0185	0.0231	0.0278	0.0324	0.0370	0.0463	0.0555	0.0740	0.0925	0.1110
Pre-Hardened Steel 35-45 HRC	0.0147	0.0168	0.0210	0.0263	0.0315	0.0368	0.0420	0.0525	0.0630	0.0840	0.1050	0.1260
Hardened Steel 45-55 HRC	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 55-65 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140

5xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.055	0.45	95	0.0046	0.0069	0.0092	0.0115	0.0138
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.050	0.40	85	0.0040	0.0060	0.0080	0.0100	0.0120
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.050	0.40	85	0.0040	0.0060	0.0080	0.0100	0.0120
High Temp Alloys	S	●	x	x	2D/3D HSC	0.022	0.20	50	0.0030	0.0045	0.0060	0.0075	0.0090
Titanium Alloys	S	●	x	x	2D/3D HSC	0.036	0.30	85	0.0036	0.0054	0.0072	0.0090	0.0108
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.039	0.35	80	0.0040	0.0060	0.0080	0.0100	0.0120
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.028	0.30	70	0.0038	0.0057	0.0076	0.0095	0.0114
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.025	0.20	65	0.0036	0.0054	0.0072	0.0090	0.0108

5xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)										
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0161	0.0184	0.0230	0.0288	0.0345	0.0403	0.0460	0.0575	0.0690	0.09200	0.11500	0.13800
Die / Tool Steels	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.08000	0.10000	0.12000
Austentic Stainless Steels	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
High Temp Alloys	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
Titanium Alloys	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080
Pre-Hardened Steel 35-45 HRC	0.0140	0.0160	0.0200	0.0250	0.0300	0.0350	0.0400	0.0500	0.0600	0.0800	0.1000	0.1200
Hardened Steel 45-55 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Hardened Steel 55-65 HRC	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080

8xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.040	0.35	85	0.0044	0.0066	0.0088	0.0110	0.0132
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.036	0.35	75	0.0038	0.0057	0.0076	0.0095	0.0114
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.036	0.35	75	0.0038	0.0057	0.0076	0.0095	0.0114
High Temp Alloys	S	●	x	x	2D/3D HSC	0.016	0.15	45	0.0030	0.0045	0.0060	0.0075	0.0090
Titanium Alloys	S	●	x	x	2D/3D HSC	0.026	0.25	75	0.0034	0.0051	0.0068	0.0085	0.0102
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.028	0.35	70	0.0038	0.0057	0.0076	0.0095	0.0114
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.020	0.30	60	0.0038	0.0057	0.0076	0.0095	0.0114
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.018	0.15	60	0.0036	0.0054	0.0072	0.0090	0.0108

8xD Neck Length

Workpiece Material Group	End Mill Diameter (mm)										
	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
	fz - mm/tooth											
Medium Carbon Steels	0.0154	0.0176	0.0220	0.0275	0.0330	0.0385	0.0440	0.0550	0.0660	0.08800	0.11000	0.13200
Die / Tool Steels	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.07600	0.09500	0.11400
Austentic Stainless Steels	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
High Temp Alloys	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
Titanium Alloys	0.0119	0.0136	0.0170	0.0213	0.0255	0.0298	0.0340	0.0425	0.0510	0.0680	0.0850	0.1020
Pre-Hardened Steel 35-45 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Hardened Steel 45-55 HRC	0.0133	0.0152	0.0190	0.0238	0.0285	0.0333	0.0380	0.0475	0.0570	0.0760	0.0950	0.1140
Hardened Steel 55-65 HRC	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.0720	0.0900	0.1080

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2S High Speed Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

10xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.026	0.35	85	0.0036	0.0054	0.0072	0.0090	0.0108
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.023	0.30	75	0.0032	0.0048	0.0064	0.0080	0.0096
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.023	0.30	75	0.0032	0.0048	0.0064	0.0080	0.0096
High Temp Alloys	S	●	x	x	2D/3D HSC	0.010	0.15	45	0.0024	0.0036	0.0048	0.0060	0.0072
Titanium Alloys	S	●	x	x	2D/3D HSC	0.017	0.25	75	0.0028	0.0042	0.0056	0.0070	0.0084
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.018	0.25	70	0.0032	0.0048	0.0064	0.0080	0.0096
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.013	0.25	60	0.0030	0.0045	0.0060	0.0075	0.0090
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.011	0.15	60	0.0028	0.0042	0.0056	0.0070	0.0084

10xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm)											
		0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0126	0.0144	0.0180	0.0225	0.0270	0.0315	0.0360	0.0450	0.0540	0.07200	0.09000	0.10800
Die / Tool Steels	P	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.06400	0.08000	0.09600
Austentic Stainless Steels	M	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
High Temp Alloys	S	0.0084	0.0096	0.0120	0.0150	0.0180	0.0210	0.0240	0.0300	0.0360	0.0480	0.0600	0.0720
Titanium Alloys	S	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840
Pre-Hardened Steel 35-45 HRC	H	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.0640	0.0800	0.0960
Hardened Steel 45-55 HRC	H	0.0105	0.0120	0.0150	0.0188	0.0225	0.0263	0.0300	0.0375	0.0450	0.0600	0.0750	0.0900
Hardened Steel 55-65 HRC	H	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840

12xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.026	0.25	75	0.0032	0.0048	0.0064	0.0080	0.0096
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.023	0.25	65	0.0028	0.0042	0.0056	0.0070	0.0084
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.023	0.25	65	0.0028	0.0042	0.0056	0.0070	0.0084
High Temp Alloys	S	●	x	x	2D/3D HSC	0.010	0.10	40	0.0020	0.0030	0.0040	0.0050	0.0060
Titanium Alloys	S	●	x	x	2D/3D HSC	0.017	0.20	65	0.0024	0.0036	0.0048	0.0060	0.0072
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.018	0.20	60	0.0028	0.0042	0.0056	0.0070	0.0084
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.013	0.20	55	0.0026	0.0039	0.0052	0.0065	0.0078
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.011	0.10	50	0.0024	0.0036	0.0048	0.0060	0.0072

12xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm)											
		0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0112	0.0128	0.0160	0.0200	0.0240	0.0280	0.0320	0.0400	0.0480	0.06400	0.08000	0.09600
Die / Tool Steels	P	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.05600	0.07000	0.08400
Austentic Stainless Steels	M	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840
High Temp Alloys	S	0.0070	0.0080	0.0100	0.0125	0.0150	0.0175	0.0200	0.0250	0.0300	0.0400	0.0500	0.0600
Titanium Alloys	S	0.0084	0.0096	0.0120	0.0150	0.0180	0.0210	0.0240	0.0300	0.0360	0.0480	0.0600	0.0720
Pre-Hardened Steel 35-45 HRC	H	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.0560	0.0700	0.0840
Hardened Steel 45-55 HRC	H	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.0520	0.0650	0.0780
Hardened Steel 55-65 HRC	H	0.0084	0.0096	0.0120	0.0150	0.0180	0.0210	0.0240	0.0300	0.0360	0.0480	0.0600	0.0720

15xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm)				
						Multiply tool Ø by this factor to calculate depths of cut			0.2	0.3	0.4	0.5	0.6
									fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	2D/3D HSC	0.015	0.25	75	0.0028	0.0042	0.0056	0.0070	0.0084
Die / Tool Steels	P	●	●	o	2D/3D HSC	0.014	0.20	65	0.0026	0.0039	0.0052	0.0065	0.0078
Austentic Stainless Steels	M	●	x	o	2D/3D HSC	0.014	0.20	65	0.0026	0.0039	0.0052	0.0065	0.0078
High Temp Alloys	S	●	x	x	2D/3D HSC	0.006	0.10	40	0.0020	0.0030	0.0040	0.0050	0.0060
Titanium Alloys	S	●	x	x	2D/3D HSC	0.010	0.15	65	0.0022	0.0033	0.0044	0.0055	0.0066
Pre-Hardened Steel 35-45 HRC	H	o	●	●	2D/3D HSC	0.011	0.20	60	0.0026	0.0039	0.0052	0.0065	0.0078
Hardened Steel 45-55 HRC	H	x	●	●	2D/3D HSC	0.008	0.15	55	0.0024	0.0036	0.0048	0.0060	0.0072
Hardened Steel 55-65 HRC	H	x	●	●	2D/3D HSC	0.007	0.10	50	0.0022	0.0033	0.0044	0.0055	0.0066

15xD Neck Length

Workpiece Material Group	ISO	End Mill Diameter (mm)											
		0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0	6.0
		fz - mm/tooth											
Medium Carbon Steels	P	0.0098	0.0112	0.0140	0.0175	0.0210	0.0245	0.0280	0.0350	0.0420	0.05600	0.07000	0.08400
Die / Tool Steels	P	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.05200	0.06500	0.07800
Austentic Stainless Steels	M	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.0520	0.0650	0.0780
High Temp Alloys	S	0.0070	0.0080	0.0100	0.0125	0.0150	0.0175	0.0200	0.0250	0.0300	0.0400	0.0500	0.0600
Titanium Alloys	S	0.0077	0.0088	0.0110	0.0138	0.0165	0.0193	0.0220	0.0275	0.0330	0.0440	0.0550	0.0660
Pre-Hardened Steel 35-45 HRC	H	0.0091	0.0104	0.0130	0.0163	0.0195	0.0228	0.0260	0.0325	0.0390	0.0520	0.0650	0.0780
Hardened Steel 45-55 HRC	H	0.0084	0.0096	0.0120	0.0150	0.0180	0.0210	0.0240	0.0300	0.0360	0.0480	0.0600	0.0720
Hardened Steel 55-65 HRC	H	0.0077	0.0088	0.0110	0.0138	0.0165	0.0193	0.0220	0.0275	0.0330	0.0440	0.0550	0.0660

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance or 0.05 to 0.01 x tool Ø, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Ae should be adjusted surface finish requirements. As a guide, 0.02 to 0.03 x tool Ø is a good starting point.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2S, XM2R & XM4R General Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

3xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.5	-	95	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.1	200	0.0007	0.0013	0.0020	0.0026	0.0033
Die / Tool Steels		●	●	o	Slotting	0.5	-	80	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.1	170	0.0007	0.0013	0.0020	0.0026	0.0033
Austentic Stainless Steels	M	●	X	o	Slotting	0.5	-	75	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.1	150	0.0007	0.0013	0.0020	0.0026	0.0033
Duplex & Super Duplex		●	X	o	Slotting	0.5	-	65	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.1	100	0.0007	0.0013	0.0020	0.0026	0.0033
High Temp Alloys	S	●	X	X	Slotting	0.5	-	30	0.0002	0.0004	0.0006	0.0008	0.0010
					Profiling	1.0	0.05	45	0.0006	0.0011	0.0017	0.0022	0.0028
Titanium Alloys		●	X	X	Slotting	0.5	-	75	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.1	107	0.0004	0.0008	0.0012	0.0016	0.0020

3xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.5	-	95	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.00960	0.01200	0.01440
					Profiling	1.0	0.1	200	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.02640	0.03300	0.03960
Die / Tool Steels		●	●	o	Slotting	0.5	-	80	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.00960	0.01200	0.01440
					Profiling	1.0	0.1	170	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.02640	0.03300	0.03960
Austentic Stainless Steels	M	●	X	o	Slotting	0.5	-	75	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.1	150	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.0264	0.0330	0.0396
Duplex & Super Duplex		●	X	o	Slotting	0.5	-	65	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.1	100	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.0264	0.0330	0.0396
High Temp Alloys	S	●	X	X	Slotting	0.5	-	30	0.0012	0.0014	0.0016	0.0018	0.0020	0.0030	0.0040	0.0050	0.0060	0.0080	0.0100	0.0120
					Profiling	1.0	0.05	45	0.0034	0.0039	0.0045	0.0050	0.0056	0.0084	0.0112	0.0140	0.0168	0.0224	0.0280	0.0336
Titanium Alloys		●	X	X	Slotting	0.5	-	75	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.1	107	0.0024	0.0028	0.0032	0.0036	0.0040	0.0060	0.0080	0.0100	0.0120	0.0160	0.0200	0.0240

5xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.3	-	95	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.08	200	0.0007	0.0013	0.0020	0.0026	0.0033
Die / Tool Steels		●	●	o	Slotting	0.3	-	80	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.08	170	0.0007	0.0013	0.0020	0.0026	0.0033
Austentic Stainless Steels	M	●	X	o	Slotting	0.3	-	75	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.08	150	0.0007	0.0013	0.0020	0.0026	0.0033
Duplex & Super Duplex		●	X	o	Slotting	0.3	-	65	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.08	100	0.0007	0.0013	0.0020	0.0026	0.0033
High Temp Alloys	S	●	X	X	Slotting	0.3	-	30	0.0002	0.0004	0.0006	0.0008	0.0010
					Profiling	1.0	0.05	45	0.0006	0.0011	0.0017	0.0022	0.0028
Titanium Alloys		●	X	X	Slotting	0.3	-	75	0.0002	0.0005	0.0007	0.0010	0.0012
					Profiling	1.0	0.08	110	0.0004	0.0008	0.0012	0.0016	0.0020

5xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.3	-	95	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.00960	0.01200	0.01440
					Profiling	1.0	0.08	200	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.02640	0.03300	0.03960
Die / Tool Steels		●	●	o	Slotting	0.3	-	80	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.00960	0.01200	0.01440
					Profiling	1.0	0.08	170	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.02640	0.03300	0.03960
Austentic Stainless Steels	M	●	X	o	Slotting	0.3	-	75	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.08	150	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.0264	0.0330	0.0396
Duplex & Super Duplex		●	X	o	Slotting	0.3	-	65	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.08	100	0.0040	0.0046	0.0053	0.0059	0.0066	0.0099	0.0132	0.0165	0.0198	0.0264	0.0330	0.0396
High Temp Alloys	S	●	X	X	Slotting	0.3	-	30	0.0012	0.0014	0.0016	0.0018	0.0020	0.0030	0.0040	0.0050	0.0060	0.0080	0.0100	0.0120
					Profiling	1.0	0.05	45	0.0034	0.0039	0.0045	0.0050	0.0056	0.0084	0.0112	0.0140	0.0168	0.0224	0.0280	0.0336
Titanium Alloys		●	X	X	Slotting	0.3	-	75	0.0014	0.0017	0.0019	0.0022	0.0024	0.0036	0.0048	0.0060	0.0072	0.0096	0.0120	0.0144
					Profiling	1.0	0.08	110	0.0024	0.0028	0.0032	0.0036	0.0040	0.0060	0.0080	0.0100	0.0120	0.0160	0.0200	0.0240

8xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.2	-	85	0.0002	0.0004	0.0007	0.0009	0.0011
					Profiling	0.75	0.05	180	0.0006	0.0012	0.0018	0.0024	0.0030
Die / Tool Steels		●	●	o	Slotting	0.2	-	75	0.0002	0.0004	0.0007	0.0009	0.0011
					Profiling	0.75	0.05	155	0.0006	0.0012	0.0018	0.0024	0.0030
Austentic Stainless Steels	M	●	X	o	Slotting	0.2	-	70	0.0002	0.0004	0.0007	0.0009	0.0011
					Profiling	0.75	0.05	135	0.0006	0.0012	0.0018	0.0024	0.0030
Duplex & Super Duplex		●	X	o	Slotting	0.2	-	60	0.0002	0.0004	0.0007	0.0009	0.0011
					Profiling	0.75	0.05	90	0.0006	0.0012	0.0018	0.0024	0.0030
High Temp Alloys	S	●	X	X	Slotting	0.2	-	28	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.75	0.05	40	0.0005	0.0010	0.0015	0.0020	0.0025
Titanium Alloys		●	X	X	Slotting	0.2	-	68	0.0002	0.0004	0.0007	0.0009	0.0011
					Profiling	0.75	0.05	95	0.0004	0.0007	0.0011	0.0014	0.0018

8xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.2	-	85	0.0013	0.0015	0.0018	0.0020	0.0022	0.0033	0.0044	0.0055	0.0066	0.00880	0.01100	0.01320
					Profiling	0.75	0.05	180	0.0035	0.0041	0.0047	0.0053	0.0059	0.0089	0.0118	0.0148	0.0177	0.02360	0.02950	0.03540
Die / Tool Steels		●	●	o	Slotting	0.2	-	75	0.0013	0.0015	0.0018	0.0020	0.0022	0.0033	0.0044	0.0055	0.0066	0.00880	0.01100	0.01320
					Profiling	0.75	0.05	155	0.0035	0.0041	0.0047	0.0053	0.0059	0.0089	0.0118	0.0148	0.0177	0.02360	0.02950	0.03540
Austentic Stainless Steels	M	●	X	o	Slotting	0.2	-	70	0.0013	0.0015	0.0018	0.0020	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088	0.0110	0.0132
					Profiling	0.75	0.05	135	0.0035	0.0041	0.0047	0.0053	0.0059	0.0089	0.0118	0.0148	0.0177	0.0236	0.0295	0.0354
Duplex & Super Duplex		●	X	o	Slotting	0.2	-	60	0.0013	0.0015	0.0018	0.0020	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088	0.0110	0.0132
					Profiling	0.75	0.05	90	0.0035	0.0041	0.0047	0.0053	0.0059	0.0089	0.0118	0.0148	0.0177	0.0236	0.0295	0.0354
High Temp Alloys	S	●	X	X	Slotting	0.2	-	28	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.75	0.05	40	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	0.0250	0.0300
Titanium Alloys		●	X	X	Slotting	0.2	-	68	0.0013	0.0015	0.0018	0.0020	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088	0.0110	0.0132
					Profiling	0.75	0.05	95	0.0022	0.0025	0.0029	0.0032	0.0036	0.0054	0.0072	0.0090	0.0108	0.0144	0.0180	0.0216

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth.
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- It is recommended to use radius tools for roughing and square-end tools for finishing.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

TuffCut® XM Series XM2S, XM2R & XM4R General Cutting

Recommended cutting data | Conditions de coupe recommandées | Empfohlene Schnittdaten | Dati di taglio Raccomandati | Zalecane Parametry

10xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.15	-	75	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.5	0.035	160	0.0005	0.0010	0.0015	0.0020	0.0025
Die / Tool Steels		●	●	o	Slotting	0.15	-	65	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.5	0.035	135	0.0005	0.0010	0.0015	0.0020	0.0025
Austentic Stainless Steels	M	●	X	o	Slotting	0.15	-	60	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.5	0.035	120	0.0005	0.0010	0.0015	0.0020	0.0025
Duplex & Super Duplex		●	X	o	Slotting	0.15	-	55	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.5	0.035	80	0.0005	0.0010	0.0015	0.0020	0.0025
High Temp Alloys	S	●	X	X	Slotting	0.15	-	25	0.0002	0.0003	0.0005	0.0006	0.0008
					Profiling	0.5	0.035	35	0.0004	0.0008	0.0013	0.0017	0.0021
Titanium Alloys		●	X	X	Slotting	0.15	-	60	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.5	0.035	85	0.0003	0.0006	0.0009	0.0012	0.0015

10xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.00720	0.00900	0.01080
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.02000	0.02500	0.03000
Die / Tool Steels		●	●	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.00720	0.00900	0.01080
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.02000	0.02500	0.03000
Austentic Stainless Steels	M	●	X	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	0.0250	0.0300
Duplex & Super Duplex		●	X	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	0.0250	0.0300
High Temp Alloys	S	●	X	X	Slotting	0.0009	0.0011	0.0012	0.0014	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090
					Profiling	0.0025	0.0029	0.0034	0.0038	0.0042	0.0063	0.0084	0.0105	0.0126	0.0168	0.0210	0.0252
Titanium Alloys		●	X	X	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0018	0.0021	0.0024	0.0027	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120	0.0150	0.0180

12xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.125	-	70	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.4	0.03	150	0.0005	0.0010	0.0015	0.0020	0.0025
Die / Tool Steels		●	●	o	Slotting	0.125	-	60	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.4	0.03	130	0.0005	0.0010	0.0015	0.0020	0.0025
Austentic Stainless Steels	M	●	X	o	Slotting	0.125	-	55	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.4	0.03	110	0.0005	0.0010	0.0015	0.0020	0.0025
Duplex & Super Duplex		●	X	o	Slotting	0.125	-	50	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.4	0.03	75	0.0005	0.0010	0.0015	0.0020	0.0025
High Temp Alloys	S	●	X	X	Slotting	0.125	-	22	0.0002	0.0003	0.0005	0.0006	0.0008
					Profiling	0.4	0.03	32	0.0004	0.0008	0.0013	0.0017	0.0021
Titanium Alloys		●	X	X	Slotting	0.125	-	55	0.0002	0.0004	0.0005	0.0007	0.0009
					Profiling	0.4	0.03	75	0.0003	0.0006	0.0009	0.0012	0.0015

12xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.00720	0.00900	0.01080
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.02000	0.02500	0.03000
Die / Tool Steels		●	●	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.00720	0.00900	0.01080
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.02000	0.02500	0.03000
Austentic Stainless Steels	M	●	X	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	0.0250	0.0300
Duplex & Super Duplex		●	X	o	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0030	0.0035	0.0040	0.0045	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	0.0250	0.0300
High Temp Alloys	S	●	X	X	Slotting	0.0009	0.0011	0.0012	0.0014	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090
					Profiling	0.0025	0.0029	0.0034	0.0038	0.0042	0.0063	0.0084	0.0105	0.0126	0.0168	0.0210	0.0252
Titanium Alloys		●	X	X	Slotting	0.0011	0.0013	0.0014	0.0016	0.0018	0.0027	0.0036	0.0045	0.0054	0.0072	0.0090	0.0108
					Profiling	0.0018	0.0021	0.0024	0.0027	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120	0.0150	0.0180

15xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	ADOC (Ap)	RWOC (Ae)	Vc - M/Min	End Mill Diameter (mm): 0.1	0.2	0.3	0.4	0.5
						Multiply tool Ø by this factor to calculate depths of cut			fz - mm/tooth				
Medium Carbon Steels	P	●	●	o	Slotting	0.1	-	60	0.0002	0.0003	0.0005	0.0007	0.0009
					Profiling	0.3	0.025	125	0.0005	0.0009	0.0014	0.0018	0.0023
Die / Tool Steels		●	●	o	Slotting	0.1	-	50	0.0002	0.0003	0.0005	0.0007	0.0009
					Profiling	0.3	0.025	110	0.0005	0.0009	0.0014	0.0018	0.0023
Austentic Stainless Steels	M	●	X	o	Slotting	0.1	-	50	0.0002	0.0003	0.0005	0.0007	0.0009
					Profiling	0.3	0.025	95	0.0005	0.0009	0.0014	0.0018	0.0023
Duplex & Super Duplex		●	X	o	Slotting	0.1	-	40	0.0002	0.0003	0.0005	0.0007	0.0009
					Profiling	0.3	0.025	65	0.0005	0.0009	0.0014	0.0018	0.0023
High Temp Alloys	S	●	X	X	Slotting	0.1	-	20	0.0001	0.0003	0.0004	0.0006	0.0007
					Profiling	0.3	0.025	30	0.0004	0.0008	0.0012	0.0016	0.0020
Titanium Alloys		●	X	X	Slotting	0.1	-	50	0.0002	0.0003	0.0005	0.0007	0.0009
					Profiling	0.3	0.025	65	0.0003	0.0006	0.0008	0.0011	0.0014

15xD Neck Length

Workpiece Material Group	ISO	Coolant: Emulsion	Coolant: Air	Coolant: MQL	Application	End Mill Diameter (mm): 0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
						fz - mm/tooth											
Medium Carbon Steels	P	●	●	o	Slotting	0.0010	0.0012	0.0014	0.0015	0.0017	0.0026	0.0034	0.0043	0.0051	0.00680	0.00850	0.01020
					Profiling	0.0028	0.0032	0.0037	0.0041	0.0046	0.0069	0.0092	0.0115	0.0138	0.01840	0.02300	0.02760
Die / Tool Steels		●	●	o	Slotting	0.0010	0.0012	0.0014	0.0015	0.0017	0.0026	0.0034	0.0043	0.0051	0.00680	0.00850	0.01020
					Profiling	0.0028	0.0032	0.0037	0.0041	0.0046	0.0069	0.0092	0.0115	0.0138	0.01840	0.02300	0.02760
Austentic Stainless Steels	M	●	X	o	Slotting	0.0010	0.0012	0.0014	0.0015	0.0017	0.0026	0.0034	0.0043	0.0051	0.0068	0.0085	0.0102
					Profiling	0.0028	0.0032	0.0037	0.0041	0.0046	0.0069	0.0092	0.0115	0.0138	0.0184	0.0230	0.0276
Duplex & Super Duplex		●	X	o	Slotting	0.0010	0.0012	0.0014	0.0015	0.0017	0.0026	0.0034	0.0043	0.0051	0.0068	0.0085	0.0102
					Profiling	0.0028	0.0032	0.0037	0.0041	0.0046	0.0069	0.0092	0.0115	0.0138	0.0184	0.0230	0.0276
High Temp Alloys	S	●	X	X	Slotting	0.0008	0.0010	0.0011	0.0013	0.0014	0.0021	0.0028	0.0035	0.0042	0.0056	0.0070	0.0084
					Profiling	0.0023	0.0027	0.0031	0.0035	0.0039	0.0059	0.0078	0.0098	0.0117	0.0156	0.0195	0.0234
Titanium Alloys		●	X	X	Slotting	0.0010	0.0012	0.0014	0.0015	0.0017	0.0026	0.0034	0.0043	0.0051	0.0068	0.0085	0.0102
					Profiling	0.0017	0.0020	0.0022	0.0025	0.0028	0.0042	0.0056	0.0070	0.0084	0.0112	0.0140	0.0168

Notes

- If the required RPM for the specified Vc is not achievable due to machine limitations, use the machine's maximum RPM and calculate feed using: Feed = Max RPM × Fz × number of teeth.
- The above cutting conditions are for roughing. For semi-finishing, reduce both Ap (axial depth of cut) and Ae (radial width of cut) accordingly.
- For finishing operations, adjust Ap to material stock allowance, depending on neck length. Reduce Vc by 10-15% and Fz by 15–20%.
- Always use helical or straight ramping for entry. Avoid direct plunge in-feed to minimise tool stress and potential damage.
- Use the shortest overhang possible and minimise tool runout by utilising an accurate chucking system.
- It is recommended to use radius tools for roughing and square-end tools for finishing.
- **Please note that these cutting conditions are for guidance only and may need to be adjusted depending on the application, specific material, and surface finish requirements.**

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