



PRÄZISION

Span - um Span - Spitze



ADD-ON zum
Gesamtkatalog

ERWEITERUNG
2024

ERWEITERUNG 2024 DER KATALOG ZUM KATALOG!

Ihr Werkzeug-Update ist da: Der Gesamtkatalog 2016 dient unseren Kunden weiterhin als verlässliche Grundlage für die Werkzeugbeschaffung. Als Ergänzung informieren unsere Erweiterungskataloge Sie regelmäßig über neue Produkte in unserem Programm. So erhalten Sie auch mit der Ausgabe 2024 das vollständige Add-on zum Gesamtkatalog mit allen Neuheiten auf über 300 Seiten. Seien Sie gespannt!



P	M	K	N	S	H	Typ	Schaftform	Bohrtiefe	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperV-Bohrer ohne Innenkühlung

	•		•	○	○	○	SuperV-U	HB	3xD	VHM	TiAlN nano	DIN 6537K	3,000 - 20,000	51673	23
	•			○	○	○	SuperV-S	HA	3xD	VHM	TiAlSiN	DIN 6537K	3,000 - 20,000	51750	25
	•		•	○	○	○	SuperV-U	HB	5xD	VHM	TiAlN nano	DIN 6537L	3,000 - 20,000	51687	27

SuperV-Bohrer mit Innenkühlung

	•	○	•	○	○	○	SuperV-IK-U	HB	3xD	VHM	TiAlN nano	DIN 6537K	3,000 - 20,000	51676	29
		•		○	○		SuperV-VA	HB	3xD	VHM	AlTiN nano	DIN 6537K	3,000 - 20,000	51670	31
	•	○		○	○	○	SuperV-X	HA	3xD	VHM	TiAlN nano	DIN 6537K	3,000 - 20,000	51784	33
	•			○	•	○	SuperV-S	HA	3xD	VHM	TiAlSiN	DIN 6537K	3,000 - 20,000	51752	35
	•			○	•	○	SuperV-S	HE	3xD	VHM	TiAlSiN	DIN 6537K	3,000 - 20,000	51753	37
	•	•	•	○	○	○	SuperV-180	HA	3xD	VHM	TiAlN nano	Werksnorm	3,000 - 20,000	51718	39
			•				SuperV-AI	HA	5xD	VHM	blank	DIN 6537L	3,000 - 20,000	71791	41
	•	○	•	○	○	○	SuperV-IK-U	HB	5xD	VHM	TiAlN nano	DIN 6537L	3,000 - 20,000	51681	43
		•		○	○		SuperV-VA	HB	5xD	VHM	AlTiN nano	DIN 6537L	3,000 - 20,000	51674	45
	•	○		○	○	○	SuperV-X	HA	5xD	VHM	TiAlN nano	DIN 6537L	3,000 - 20,000	51786	47
	•			○	•	○	SuperV-S	HA	5xD	VHM	TiAlSiN	DIN 6537L	3,000 - 20,000	51754	49
	•			○	•	○	SuperV-S	HE	5xD	VHM	TiAlSiN	DIN 6537L	3,000 - 20,000	51755	51

P	M	K	N	S	H	Typ	Schaftform	Bohrtiefe	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperV-Bohrer mit Innenkühlung

	•	○	○	○	○	○	SuperV-X	HA	7xD	VHM	TiAlN nano	Werksnorm	3,000 - 20,000	51791	53
	•	○	○	○	○	○	SuperV-S	HA	7xD	VHM	TiAlSiN	Werksnorm	3,000 - 16,000	51756	55
	•	○	○	○	○	○	SuperV-X	HA	12xD	VHM	TiAlN nano	Werksnorm	3,000 - 20,000	51792	56
	•	•	•	○	○	○	SuperV-T	HA	15xD	VHM	AlTiN	Werksnorm	3,000 - 16,000	51764	58
	•	•	•	○	○	○	SuperV-T-Al	HA	15xD	VHM	blank	Werksnorm	3,000 - 14,000	71764	59
	•	•	•	○	○	○	SuperV-T	HA	20xD	VHM	AlTiN	Werksnorm	3,000 - 16,000	51765	61
	•	•	•	○	○	○	SuperV-T-Al	HA	20xD	VHM	blank	Werksnorm	3,000 - 14,000	71765	62
	•	•	•	○	○	○	SuperV-T	HA	25xD	VHM	AlTiN	Werksnorm	3,000 - 16,000	51766	64
	•	•	•	○	○	○	SuperV-T-Al	HA	25xD	VHM	blank	Werksnorm	3,000 - 14,000	71766	65
	•	•	•	○	○	○	SuperV-T	HA	30xD	VHM	AlTiN	Werksnorm	3,000 - 14,000	51767	67
	•	•	•	○	○	○	SuperV-T	HA	40xD	VHM	AlTiN	Werksnorm	3,000 - 10,000	51768	68

SuperV-M Universal-Kleinstbohrer

	•	•	•	○	○	○	SuperV-M	HA		VHM	AlTiN	Werksnorm	0,100 - 3,000	51720	69
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SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung

	•	•	•	○	○	○	SuperV-IK-NX	HA	5xD	VHM	AlTiN	Werksnorm	1,000 - 3,000	51997	71
	•	•	•	○	○	○	SuperV-IK-NX	HA	8xD	VHM	AlTiN	Werksnorm	1,000 - 3,000	51998	72

P	M	K	N	S	H	Typ	Schaftform	Bohrtiefe	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung



•	•	•	○	○		SuperV-IK-NX	HA	15xD	VHM	AlTiN	Werksnorm	1,000 - 3,000	51999	73
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SuperV-NX U Hochleistungs-Kleinstbohrer mit Innenkühlung



•	•	•	○	○		SuperV-IK-NX-U	~HA	20xD	VHM	AlTiN	Werksnorm	1,000 - 3,000	51980	74
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SuperV-NX VA Hochleistungs-Kleinstbohrer ohne Innenkühlung



○	•	•	○	•		SuperV-NX-VA	HA	3xD	VHM	TiSiN+	Werksnorm	0,500 - 3,000	51970	75
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SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung



○	•	•	○	•		SuperV-NX-VA	HA	3xD	VHM	TiSiN+	Werksnorm	1,000 - 3,000	51971	76
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○	•	•	○	•		SuperV-NX-VA	HA	6xD	VHM	TiSiN+	Werksnorm	1,000 - 3,000	51972	77
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○	•	•	○	•		SuperV-NX-VA	HA	10xD	VHM	TiSiN+	Werksnorm	1,000 - 3,000	51973	78
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○	•	•	○	•		SuperV-NX-VA	HA	15xD	VHM	TiSiN+	Werksnorm	1,000 - 3,000	51974	79
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Spiralbohrer kurz



○	○	○	•	○		N	zyl.	~5xD	VHM	TiAlN nano	Werksnorm	1,000 - 12,000	51290	80
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Spiralbohrer mit verstärktem Zylinderschaft



○	•	○	○	•		H	HA	~3xD	VHM	AlTiN	DIN 6537K	2,600 - 14,100	51146	81
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Einlippenbohrer SuperT-NXL



•	○	•	○	○	○	SuperT-NXL TBM-SEH	GL 800		HM	TiN	Werksnorm	3,000 - 25,000	65030	82
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P	M	K	N	S	H	Typ	Schaftform	Bohrtiefe	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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Einlippenbohrer SuperT-NXL



●	○	●	○	○	○	SuperT-NXL TBM-SEH	GL1200		HM	TiN	Werksnorm	3,000 - 25,000	65031	83
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●	○	●	○	○	○	SuperT-NXL TBM-SEH	GL1600		HM	TiN	Werksnorm	4,000 - 25,000	65032	84
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●	○	●	○	○	○	SuperT-NXL TBM-SEH	GL2000		HM	TiN	Werksnorm	4,000 - 32,000	65033	85
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Karosseriebohrer



●	○	●	○	○	○	N			HSS	dampfbehandelt	Werksnorm	2,000 - 10,000	71660	86
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Spiralbohrer extra kurz



○	●	○	○	○	○	V18	zyl.	~3xD	HSS-Co	AlTiZrN	DIN 1897	1,000 - 13,000	61131	87
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Spiralbohrer kurz



○	●	○	○	○	○	V18	zyl.	~5xD	HSS-Co	AlTiZrN	DIN 338	1,000 - 13,000	61232	89
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V16-Spiralbohrer



●	●	●	○	○	○	V16	zyl.	~5xD	M42	Bronze-VAP	DIN 338	1,000 - 13,000	71018	91
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V16-Spiralbohrer-Sätze



●	●	●	○	○	○	V16	zyl.	~5xD	M42	Bronze-VAP	DIN 338	0,013 - 0,014	71019	93
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P	M	K	N	S	H	Typ	Schaftform	Bohrtiefe	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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V16-Pocket-Satz (Spiralbohrer, Gewindebohrer und Senker)



•	○	○	○			N	zyl.				Werksnorm		71020	94
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Stangenbohrer, Länge 6 inches



•		•	•			N	zyl.		HSS	blank	NAS 907	1,500 - 8,500	71140	95
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•		•	•			N	zyl.		HSS	nitriert	NAS 907	1,500 - 8,000	71142	96
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Stangenbohrer, Länge 12 inches



•		•	•			N	zyl.		HSS	blank	NAS 907	1,500 - 8,500	71141	97
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•		•	•			N	zyl.		HSS	nitriert	NAS 907	1,500 - 8,000	71143	98
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P	M	K	N	S	H	Typ	Form	Toleranz- klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Gewindebohrer für Metrische ISO-Gewinde

	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E	AlTiZrN	~DIN 371/ ~DIN 376	M2 - M42	53733	99
	•	•	○	○	○	Produktiv N-X LH	B	6HX	HSS-E	AlTiZrN	DIN 371/ DIN 376	M2 - M30	53734	100
	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E-PM	AlTiZrN	DIN 371/ DIN 376	M3 - M20	53735	101
	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E-PM	AlTiZrN	DIN 371/ DIN 376	M5 - M30	53736	102
	•	•	○	○	○	Produktiv N-X	B	6H+0,1	HSS-E	AlTiZrN	DIN 371/ DIN 376	M2 - M30	53737	103
	•	•	○	○	○	Produktiv N-X	B	6GX	HSS-E	AlTiZrN	DIN 371/ DIN 376	M2 - M30	53738	104
	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E	AlTiZrN	Werksnorm	M3 - M20	53739	105
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E	TiAlN-H	~DIN 371/ ~DIN 376	M2 - M42	53746	106
	•	•	○	○	○	Intensiv N-X LH	C	6HX	HSS-E	TiAlN-H	DIN 371/ DIN 376	M2 - M30	53747	107
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E-PM	TiAlN-H	DIN 371/ DIN 376	M3 - M20	53748	108
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E-PM	TiAlN-H	DIN 371/ DIN 376	M5 - M30	53749	109
	•	•	○	○	○	Intensiv N-X	E	6HX	HSS-E	TiAlN-H	DIN 371/ DIN 376	M2 - M30	53760	110
	•	•	○	○	○	Intensiv N-X	C	6H+0,1	HSS-E	TiAlN-H	DIN 371/ DIN 376	M2 - M30	53750	111
	•	•	○	○	○	Intensiv N-X	C	6GX	HSS-E	TiAlN-H	DIN 371/ DIN 376	M2 - M30	53751	112
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E	TiAlN-H	Werksnorm	M3 - M20	53752	113
	•	○	○	○	○	Produktiv N	B	ISO2/6H	HSS-E	TiN	DIN 371/ DIN 376	M3 - M20	63033	114

P	M	K	N	S	H	Typ	Form	Toleranz- klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Gewindebohrer für Metrische ISO-Gewinde

	•	•	○	○		H	C	6HX	HSS-E	TiCN	DIN 376	M16 - M39	53646	115
	•	•	○	○		H	C	6HX	HSS-E	TiCN	~DIN 376	M16 - M39	53647	116
	•	○	○	○		Produktiv H	B	ISO2/6H	HSS-E	TiCN	DIN 371/ DIN 376	M2 - M20	53642	117
	•	○	○	○		Produktiv H	B	ISO2/6H	HSS-E-PM	TiCN	DIN 371/ DIN 376	M3 - M16	53640	118
	•	○	○	○		Intensiv H	C	ISO2/6H	HSS-E	nitriert	DIN 371	M3 - M10	73661	119
	•	○	○	○		Intensiv H	C	ISO2/6H	HSS-E	nitriert	DIN 376	M12 - M20	73664	120
	•	○	○	○		Intensiv H	C	ISO2/6H	HSS-E	TiCN	DIN 371/ DIN 376	M2 - M20	53661	121
	≤ 1200	○	○	○		Intensiv H	C	ISO2/6H	HSS-E-PM	TiAlN	DIN 371/ DIN 376	M4 - M20	53664	122
			○			H	D	6HX	HSS-E-PM	TiCN	DIN 371/ DIN 376	M3 - M16	53676	123

Gewindebohrer für Metrische ISO-Feingewinde

	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E	AlTiZrN	DIN 374	M3 x 0,35 - M24 x 2	53778	124
	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E-PM	AlTiZrN	DIN 374	M8 x 1 - M24 x 1,5	53789	125
	•	•	○	○	○	Produktiv N-X	B	6HX	HSS-E-PM	AlTiZrN	DIN 374	M8 x 1 - M24 x 1,5	53790	126
	•	•	○	○	○	Produktiv N-X	B	6GX	HSS-E	AlTiZrN	DIN 374	M6 x 0,75 - M24 x 1,5	53779	127
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E	TiAlN-H	DIN 374	M3 x 0,35 - M24 x 2	53780	128
	•	•	○	○	○	Intensiv N-X	C	6HX	HSS-E-PM	TiAlN-H	DIN 374	M8 x 1 - M24 x 1,5	53791	129

P	M	K	N	S	H	Typ	Form	Toleranz- klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Gewindebohrer für Metrische ISO-Feingewinde

	Intensiv N-X	C	6HX	HSS-E-PM	TiAlN-H	DIN 374	M8 x 1 - M24 x 1,5	53792	130
	Intensiv N-X	E	6HX	HSS-E	TiAlN-H	DIN 374	M6 x 0,75 - M24 x 1,5	53770	131
	Intensiv N-X	C	6GX	HSS-E	TiAlN-H	DIN 374	M6 x 0,75 - M24 x 1,5	53781	132
	Intensiv H	C	ISO2/6H	HSS-E	nitriert	DIN 374	M8 x 0,75 - M24 x 1,5	73647	133

Gewindebohrer für UNC-Gewinde

	Produktiv N-X	B	2BX	HSS-E	AlTiZrN	DIN 371/ DIN 376	2 - 56 - 1 - 8	53782	134
	Intensiv N-X	C	2BX	HSS-E	TiAlN-H	DIN 371/ DIN 376	2 - 56 - 1 - 8	53783	135

Gewindebohrer für UNF-Gewinde

	Produktiv N-X	B	2BX	HSS-E	AlTiZrN	~DIN 371/ ~DIN 374	2 - 64 - 1 - 12	53784	136
	Intensiv N-X	C	2BX	HSS-E	TiAlN-H	~DIN 371/~DIN 374	2 - 64 - 1 - 12	53785	137

Gewindebohrer für BSW-Gewinde

	Produktiv N-X	B		HSS-E	AlTiZrN	~DIN 371	W1/8 - W1	53793	138
	Intensiv N-X	C		HSS-E	TiAlN-H	~DIN 371	W1/8 - W1	53794	139

Gewindebohrer für Whitworth-Rohrgewinde

	Produktiv N-X	B		HSS-E	AlTiZrN	DIN 5156	Rp1/16 - Rp3/4	53795	140
	Intensiv N-X	C		HSS-E	TiAlN-H	DIN 5156	Rp1/16 - Rp3/4	53796	141

P	M	K	N	S	H	Typ	Form	Toleranz- klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Gewindebohrer für Whitworth-Rohrgewinde



•	•	○	○	○		Intensiv N-X	E		HSS-E	TiAlN-H	DIN 5156	G1/16 - G1	53775	142
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Gewindeformer für Metrische ISO-Gewinde



•	•	•	○	•		Durativ N-X	C	4HX/6HX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 376	M1 - M20	53630	143
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•	•	•	○	•		Durativ N-X	C	6GX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 376	M2 - M20	53631	144
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Gewindeformer für Metrische ISO-Feingewinde



•	•	•	○	•		Durativ N-X	C	6HX	HSS-E-PM	TiCN	~DIN 374	M3 x 0,35 - M24 x 2	53632	145
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Gewindeformer für UNC-Gewinde



•	•	•	○	•		Durativ N-X	C	2BX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 376	4 - 40 - 3/4 - 10	53633	146
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Gewindeformer für UNF-Gewinde



•	•	•	○	•		Durativ N-X	C	2BX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 374	4 - 48 - 3/4 - 16	53634	147
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Gewindeformer für Whitworth-Rohrgewinde



•	•	•	○	•		Durativ N-X	C		HSS-E-PM	TiCN	DIN 2189	G1/8 - G1/2	53635	148
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Kühlkanal-Gewindeformer für Metr. ISO-Gewinde



•	•	•	○	•		Durativ N-X	C	6HX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 376	M5 - M20	53610	149
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•	•	•	○	•		Durativ N-X	E	6HX	HSS-E-PM	TiCN	~DIN 371/ ~DIN 376	M2 - M20	53618	150
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P	M	K	N	S	H	Typ	Form	Toleranz-klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Kühlkanal-Gewindeformer für Metr. ISO-Feingewinde

						Durativ N-X	C	6HX	HSS-E-PM	TiCN	~DIN 374	M8 x 1 - M20 x 1,5	53612	151
						Durativ N-X	E	6HX	HSS-E-PM	TiCN	~DIN 374	M8 x 1 - M20 x 1,5	53619	152

Bohrgewindefräser für Metrische ISO-Gewinde

						≤ 66	TMD-NX	VHM	TiSiN+	Werksnorm	M2 - M16	53948	153
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Bohrgewindefräser für UNC-/UNF-Gewinde

						≤ 66	TMD-NX	VHM	TiSiN+	Werksnorm	1 - 72 - 1/2 - 20	53949	154
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Bohrgewindefräser für Rohrgewinde

						≤ 66	TMD-NX	VHM	TiSiN+	Werksnorm		53950	155
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Gewindefräser mit Senkfase für Metrische ISO-Gewinde

							TMC-NX SP	VHM	AlCrN	Werksnorm	M3 - M16 x 1,5	53890	156
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Gewindefräser ohne Senkfase für Metr. ISO-Gewinde

						≤ 55	TM SP	VHM	AlTiZrN	Werksnorm	M6 - M20	53860	157
						≤ 55	TMU SP	VHM	AlTiZrN	Werksnorm	> 10 - > 30	73830	158

Gewindefräser ohne Senkfase für Whitworth-Rohrgewinde

						≤ 55	TM SP	VHM	AlTiZrN	Werksnorm	G1/8 - G3/8	53831	159
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P	M	K	N	S	H	Typ	Form	Toleranz- klasse	Schneidstoff	Oberfläche	Norm	d1	Katalog-Nr.	Progr. Seite
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Mehrbereichsgewindefräser für Whitworth-Rohrgewinde



•	•	•	•	•	•	≤ 55	TMU SP		VHM	AlTiZrN	Werksnorm	≥ 1/4 - ≥ 1	53832	160
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Mikrogewindefräser für Metrische ISO-Gewinde



•	•	•	•	•	•	≤ 55	MTM-NX SP		VHM	AlTiZrN	Werksnorm	M1,6 - M20	53892	161
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•	•	•	•	•	•		TM SP		VHM	AlTiZrN	Werksnorm	M1,6 - M16	53840	162
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•	•	•	•	•	•	○	•	TM SP	VHM	TiSiN+	Werksnorm	M2 - M12	53850	163
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Mikrogewindefräser für Whitworth-Rohrgewinde



•	•	•	•	•	•		TM SP		VHM	AlTiZrN	Werksnorm	G1/8 - G2	53841	164
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperF-UT-Fräser Z



•	•	•	•	•		SuperF-UT Z	HB	VHM	AlTiN+	Werksnorm	3,000 - 20,000	54577	165
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SuperF-UT-Fräser ZS



•	•	•	•	•		SuperF-UT ZS	HB	VHM	AlTiN+	Werksnorm	3,000 - 20,000	54578	166
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•	•	•	○	•		SuperF-UT ZS-r	HB	VHM	AlTiN+	Werksnorm	6,000 - 20,000	54555	167
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•	•	•	○	•		SuperF-UT ZS-7	HB	VHM	AlTiN+	Werksnorm	6,000 - 20,000	54581	168
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SuperF-UT-Fräser N-5



•	•	•	•	•		SuperF-UT N-5	HA	VHM	TiAlN	Werksnorm	4,000 - 20,000	54583	169
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•	•	•	•	•		SuperF-UT N-5	HB	VHM	TiAlN	Werksnorm	4,000 - 20,000	54584	170
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SuperF-UT-Fräser FS²



○	•	○	•	•	○	SuperF-UT FS ²	HB	VHM	TiAlZrN	Werksnorm	8,000 - 20,000	64560	171
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SuperF-UT-Fräser NX-3



•	•	•	•	•		SuperF-UT NX-3	HA	VHM	TiAlSiN	Werksnorm	3,000 - 20,000	54586	172
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•	•	•	•	•		SuperF-UT NX-3	HB	VHM	TiAlSiN	Werksnorm	3,000 - 20,000	54587	173
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SuperF-UT-Fräser NX



•	•	•	•	•		SuperF-UT NX	HB	VHM	TiAlSiN	DIN 6527K	3,000 - 20,000	54589	174
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperF-UT-Fräser NX



•	•	•	•	•		SuperF-UT NX-IK	HB	VHM	TiAlSiN	DIN 6527L	6,000 - 25,000	54585	175
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SuperF-UT-Fräser NX Micro



•	•	•	•	•	○	SuperF-UT NX Micro	zyl.	VHM	TiSiN+	Werksnorm	0,500 - 3,000	54594	176
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•	•	•	•	•	○	SuperF-UT NX Micro	zyl.	VHM	TiSiN+	Werksnorm	0,500 - 3,000	54595	177
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SuperF-UT-Fräser Ti



•	•	•	•	•		SuperF-UT Ti	HA	VHM	ZrN	DIN 6527L	6,000 - 20,000	54560	178
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•	•	•	•	•		SuperF-UT Ti	HB	VHM	ZrN	DIN 6527L	6,000 - 20,000	54561	179
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SuperF-UT-Fräser H-X



○	•	•	•	•		SuperF-UT H-X	HA	VHM	TiAlSiN	DIN 6527L	3,000 - 20,000	54340	180
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○	•	•	•	•		SuperF-UT H-X	HB	VHM	TiAlSiN	DIN 6527L	3,000 - 20,000	54341	181
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SuperF-UT-Fräser S



○	○	○	○	○		SuperF-UT S	HA	VHM	AlTiN nano	DIN 6527L	3,000 - 20,000	54556	182
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SuperF-UT-Fräser N²



•	○	•	○	○	○	SuperF-UT N ²	HB	VHM	TiAlZrN	DIN 6527L	3,000 - 25,000	64552	183
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperF-UT-Fräser NL



•	○	•	○	○	○	SuperF-UT NL	HB	VHM	TiAlN	Werksnorm	6,000 - 25,000	54553	184
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SuperF-UT-Fräser N-r



•	○	•	•	○	○	SuperF-UT N-r	HB	VHM	AlCrN	DIN 6527L	3,000 - 20,000	54550	185
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SuperF-UT-Fräser U



•	•	•	•	•	○	SuperF-UT U	HA	VHM	AlCrN	Werksnorm	1,000 - 20,000	54500	187
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•	•	•	•	•	○	SuperF-UT U	HB	VHM	AlCrN	Werksnorm	4,000 - 20,000	54501	188
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SuperF-UT-Fräser UL



•	•	•	•	•	○	SuperF-UT UL	HA	VHM	AlCrN	Werksnorm	1,000 - 20,000	54502	189
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•	•	•	•	•	○	SuperF-UT UL	HB	VHM	AlCrN	Werksnorm	4,000 - 20,000	54503	190
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SuperF-UT-Fräser VA-X²



○	•	•	○	•	○	SuperF-UT VA-X ²	HB	VHM	TiAlZrN	DIN 6527L	3,000 - 25,000	64553	191
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SuperF-UT-Fräser VA-r



○	•	•	○	•	○	SuperF-UT VA-r	HB	VHM	TiAlSiN	DIN 6527L	3,000 - 20,000	54542	192
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SuperF-UT-Fräser Al



•	•	•	•	•	○	SuperF-UT Al-L	HA	VHM	blank	Werksnorm	5,000 - 20,000	74557	194
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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SuperF-UT-Fräser Al

	•					SuperF-UT Al-L	HB	VHM	blank	Werksnorm	5,000 - 20,000	74556	195
	•					SuperF-UT Al-XL	HA	VHM	blank	Werksnorm	6,000 - 20,000	74559	196
	•					SuperF-UT Al-XL	HB	VHM	blank	Werksnorm	6,000 - 20,000	74558	197
	•					SuperF-UT Al-r	HA	VHM	blank	Werksnorm	6,000 - 25,000	74563	198
	•					SuperF-UT Al-r	HB	VHM	blank	Werksnorm	6,000 - 25,000	74562	199
	•					SuperF-UT Al-X	HA	VHM	DLC	Werksnorm	5,000 - 20,000	54593	200
	•					SuperF-UT Al-X	HB	VHM	DLC	Werksnorm	5,000 - 20,000	54592	201

SuperF-UT-Fräser Z, Sätze



•	•	•	•	•		SuperF-UT Z	HB	VHM	AlTiN+	Werksnorm		78882	202
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SuperF-UT-Fräser N², Sätze



•	○	•	•	○	○	SuperF-UT N ²	HB	VHM	TiAlZrN	DIN 6527L		78883	203
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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Kopierfräser mit Vollradius H B2

	○	●	●	●	●	H B2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54325	204
	○	●	●	●	●	H B2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54326	205

Kopierfräser mit Vollradius H B4

	○	●	●	●	●	H B4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54345	206
	○	●	●	●	●	H B4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54346	207

Kopierfräser mit Vollradius S B2

	●	●	●	○	●	S B2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54425	208
	●	●	●	○	●	S B2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54426	209

Kopierfräser mit Vollradius S B4

	●	●	●	○	●	S B4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54445	210
	●	●	●	○	●	S B4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54446	211

Kopierfräser mit Torusanschiff H T4

	○	●	●	●	●	HT4	HA	VHM	TiSiN+	Werksnorm	1,000 - 12,000	54347	212
	○	●	●	●	●	HT4	HA	VHM	TiSiN+	Werksnorm	1,000 - 12,000	54348	213

P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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Kopierfräser mit Torusanschliiff S T2

						S T2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54427	214
						S T2	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	0,500 - 12,000	54428	215

Kopierfräser mit Torusanschliiff S T4

						S T4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54447	216
						S T4	HA	VHM	TiSiN+/TiAlSiN	Werksnorm	1,000 - 12,000	54448	217

Hartfräser, mehrschneidig H FS6

						H FS6	HA	VHM	TiAlSiN	Werksnorm	3,000 - 20,000	54360	218
						H FS6	HA	VHM	TiAlSiN	Werksnorm	3,000 - 20,000	54361	219
						H FS6	HA	VHM	TiAlSiN	Werksnorm	3,000 - 16,000	54362	220

Kopierfräser mit Torusanschliiff

						H	HA	VHM	TiAlSiN	Werksnorm	1,000 - 16,000	54304	221
						H	HA	VHM	TiAlSiN	Werksnorm	1,000 - 16,000	54305	222
						NH	HA	VHM	TiAlSiN	Werksnorm	0,500 - 12,000	54302	223

Entgratfräser 90°

						SuperAF-90	HB	VHM	TiAlZrN	Werksnorm	6,000 - 20,000	53399	224
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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Entgratfräser 90°, spiralisiert



•	•	○	•	•		Super AFX-90	HA	VHM	TiAlZrN	Werksnorm	6,000 - 20,000	63399	225
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P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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VHM-Hochleistungs-Kopfreibahlen

		SuperR-HS-KS	HA	VHM	AlTiN nano	Werksnorm	14,000 - 42,000	72874	226
		SuperR-HS-KD	HA	VHM	AlTiN nano	Werksnorm	14,000 - 42,000	72875	227
		SuperR-HS-S	HA	VHM	DLC	Werksnorm	4,000 - 20,000	72876	228
		SuperR-HS-D	HA	VHM	DLC	Werksnorm	4,000 - 20,000	72877	229

VHM NC-Maschinen-Reibahlen

			HA	VHM	AlTiN nano	Werksnorm	0,980 - 12,050	52920	230
			HA	VHM	AlTiN nano	Werksnorm	3,000 - 20,000	52930	232

Schrumpfverlängerungen

			~HA		blank	Werksnorm		78719	233
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Kegelsenker 90° V-NX

		V-NX	zyl.	HSCO	AlTiN	DIN 335	6,300 - 40,000	52348	234
		V-NX	3-Flächen	HSCO	AlTiN	DIN 335	6,300 - 40,000	52350	235

P	M	K	N	S	H	Typ	Schaftform	Schneidstoff	Oberfläche	Norm	d1/mm	Katalog-Nr.	Progr. Seite
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Kegelsenkersätze 90° V-NX



•	•	•	○	○		V-NX	zyl.	HSCO	AlTiN	DIN 335		52398	236
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•	•	•	○	○		V-NX	3-Flächen	HSCO	AlTiN	DIN 335		52399	237
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SuperV-Bohrer

SuperV-Bohrer ohne Innenkühlung



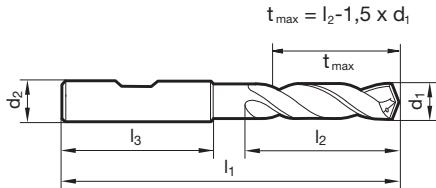
Katalog-Nr. 51673



P	M	K	N	S	H
●		●	○	○	○

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000	6,300	8,000	79,000	34,000	36,000
3,100	6,000	62,000	20,000	36,000	6,350	8,000	79,000	34,000	36,000
3,170	6,000	62,000	20,000	36,000	6,400	8,000	79,000	34,000	36,000
3,200	6,000	62,000	20,000	36,000	6,500	8,000	79,000	34,000	36,000
3,250	6,000	62,000	20,000	36,000	6,530	8,000	79,000	34,000	36,000
3,300	6,000	62,000	20,000	36,000	6,600	8,000	79,000	34,000	36,000
3,400	6,000	62,000	20,000	36,000	6,700	8,000	79,000	34,000	36,000
3,500	6,000	62,000	20,000	36,000	6,750	8,000	79,000	34,000	36,000
3,570	6,000	62,000	20,000	36,000	6,800	8,000	79,000	34,000	36,000
3,600	6,000	62,000	20,000	36,000	6,900	8,000	79,000	34,000	36,000
3,700	6,000	62,000	20,000	36,000	7,000	8,000	79,000	34,000	36,000
3,800	6,000	66,000	24,000	36,000	7,100	8,000	79,000	41,000	36,000
3,900	6,000	66,000	24,000	36,000	7,140	8,000	79,000	41,000	36,000
3,970	6,000	66,000	24,000	36,000	7,200	8,000	79,000	41,000	36,000
4,000	6,000	66,000	24,000	36,000	7,300	8,000	79,000	41,000	36,000
4,040	6,000	66,000	24,000	36,000	7,400	8,000	79,000	41,000	36,000
4,100	6,000	66,000	24,000	36,000	7,500	8,000	79,000	41,000	36,000
4,200	6,000	66,000	24,000	36,000	7,540	8,000	79,000	41,000	36,000
4,300	6,000	66,000	24,000	36,000	7,600	8,000	79,000	41,000	36,000
4,370	6,000	66,000	24,000	36,000	7,700	8,000	79,000	41,000	36,000
4,400	6,000	66,000	24,000	36,000	7,800	8,000	79,000	41,000	36,000
4,500	6,000	66,000	24,000	36,000	7,900	8,000	79,000	41,000	36,000
4,600	6,000	66,000	24,000	36,000	7,940	8,000	79,000	41,000	36,000
4,650	6,000	66,000	24,000	36,000	8,000	8,000	79,000	41,000	36,000
4,700	6,000	66,000	24,000	36,000	8,100	10,000	89,000	47,000	40,000
4,760	6,000	66,000	28,000	36,000	8,200	10,000	89,000	47,000	40,000
4,800	6,000	66,000	28,000	36,000	8,300	10,000	89,000	47,000	40,000
4,900	6,000	66,000	28,000	36,000	8,330	10,000	89,000	47,000	40,000
5,000	6,000	66,000	28,000	36,000	8,400	10,000	89,000	47,000	40,000
5,100	6,000	66,000	28,000	36,000	8,500	10,000	89,000	47,000	40,000
5,110	6,000	66,000	28,000	36,000	8,600	10,000	89,000	47,000	40,000
5,160	6,000	66,000	28,000	36,000	8,700	10,000	89,000	47,000	40,000
5,200	6,000	66,000	28,000	36,000	8,730	10,000	89,000	47,000	40,000
5,250	6,000	66,000	28,000	36,000	8,800	10,000	89,000	47,000	40,000
5,300	6,000	66,000	28,000	36,000	8,900	10,000	89,000	47,000	40,000
5,400	6,000	66,000	28,000	36,000	9,000	10,000	89,000	47,000	40,000
5,410	6,000	66,000	28,000	36,000	9,100	10,000	89,000	47,000	40,000
5,500	6,000	66,000	28,000	36,000	9,130	10,000	89,000	47,000	40,000
5,550	6,000	66,000	28,000	36,000	9,200	10,000	89,000	47,000	40,000
5,560	6,000	66,000	28,000	36,000	9,250	10,000	89,000	47,000	40,000
5,600	6,000	66,000	28,000	36,000	9,300	10,000	89,000	47,000	40,000
5,700	6,000	66,000	28,000	36,000	9,340	10,000	89,000	47,000	40,000
5,800	6,000	66,000	28,000	36,000	9,400	10,000	89,000	47,000	40,000
5,900	6,000	66,000	28,000	36,000	9,500	10,000	89,000	47,000	40,000
5,950	6,000	66,000	28,000	36,000	9,520	10,000	89,000	47,000	40,000
6,000	6,000	66,000	28,000	36,000	9,600	10,000	89,000	47,000	40,000
6,100	8,000	79,000	34,000	36,000	9,700	10,000	89,000	47,000	40,000
6,200	8,000	79,000	34,000	36,000	9,800	10,000	89,000	47,000	40,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
9,900	10,000	89,000	47,000	40,000	14,000	14,000	107,000	60,000	45,000
9,920	10,000	89,000	47,000	40,000	14,100	16,000	115,000	65,000	48,000
10,000	10,000	89,000	47,000	40,000	14,200	16,000	115,000	65,000	48,000
10,100	12,000	102,000	55,000	45,000	14,290	16,000	115,000	65,000	48,000
10,200	12,000	102,000	55,000	45,000	14,300	16,000	115,000	65,000	48,000
10,300	12,000	102,000	55,000	45,000	14,400	16,000	115,000	65,000	48,000
10,320	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
10,400	12,000	102,000	55,000	45,000	14,600	16,000	115,000	65,000	48,000
10,500	12,000	102,000	55,000	45,000	14,680	16,000	115,000	65,000	48,000
10,600	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	14,800	16,000	115,000	65,000	48,000
10,720	12,000	102,000	55,000	45,000	14,900	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	15,080	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	15,100	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
11,110	12,000	102,000	55,000	45,000	15,300	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	15,400	16,000	115,000	65,000	48,000
11,300	12,000	102,000	55,000	45,000	15,480	16,000	115,000	65,000	48,000
11,400	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,500	12,000	102,000	55,000	45,000	15,600	16,000	115,000	65,000	48,000
11,510	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,600	12,000	102,000	55,000	45,000	15,800	16,000	115,000	65,000	48,000
11,700	12,000	102,000	55,000	45,000	15,870	16,000	115,000	65,000	48,000
11,800	12,000	102,000	55,000	45,000	15,900	16,000	115,000	65,000	48,000
11,900	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,910	12,000	102,000	55,000	45,000	16,270	18,000	123,000	73,000	48,000
12,000	12,000	102,000	55,000	45,000	16,500	18,000	123,000	73,000	48,000
12,100	14,000	107,000	60,000	45,000	16,670	18,000	123,000	73,000	48,000
12,200	14,000	107,000	60,000	45,000	17,000	18,000	123,000	73,000	48,000
12,300	14,000	107,000	60,000	45,000	17,070	18,000	123,000	73,000	48,000
12,400	14,000	107,000	60,000	45,000	17,460	18,000	123,000	73,000	48,000
12,500	14,000	107,000	60,000	45,000	17,500	18,000	123,000	73,000	48,000
12,600	14,000	107,000	60,000	45,000	17,860	18,000	123,000	73,000	48,000
12,700	14,000	107,000	60,000	45,000	18,000	18,000	123,000	73,000	48,000
12,800	14,000	107,000	60,000	45,000	18,260	20,000	131,000	79,000	50,000
12,900	14,000	107,000	60,000	45,000	18,500	20,000	131,000	79,000	50,000
13,000	14,000	107,000	60,000	45,000	19,000	20,000	131,000	79,000	50,000
13,100	14,000	107,000	60,000	45,000	19,050	20,000	131,000	79,000	50,000
13,200	14,000	107,000	60,000	45,000	19,250	20,000	131,000	79,000	50,000
13,300	14,000	107,000	60,000	45,000	19,446	20,000	131,000	79,000	50,000
13,400	14,000	107,000	60,000	45,000	19,500	20,000	131,000	79,000	50,000
13,490	14,000	107,000	60,000	45,000	19,840	20,000	131,000	79,000	50,000
13,500	14,000	107,000	60,000	45,000	20,000	20,000	131,000	79,000	50,000
13,600	14,000	107,000	60,000	45,000					
13,700	14,000	107,000	60,000	45,000					
13,800	14,000	107,000	60,000	45,000					
13,900	14,000	107,000	60,000	45,000					

SuperV-Bohrer

SuperV-Bohrer ohne Innenkühlung



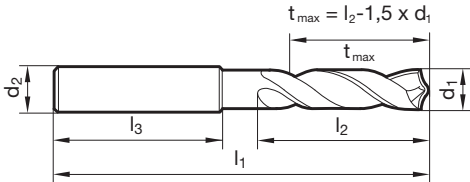
Katalog-Nr. 51750



P	M	K	N	S	H
●				○	○

Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelanschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000
3,100	6,000	62,000	20,000	36,000
3,170	6,000	62,000	20,000	36,000
3,200	6,000	62,000	20,000	36,000
3,250	6,000	62,000	20,000	36,000
3,300	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
3,500	6,000	62,000	20,000	36,000
3,570	6,000	62,000	20,000	36,000
3,600	6,000	62,000	20,000	36,000
3,700	6,000	62,000	20,000	36,000
3,800	6,000	66,000	24,000	36,000
3,900	6,000	66,000	24,000	36,000
3,970	6,000	66,000	24,000	36,000
4,000	6,000	66,000	24,000	36,000
4,100	6,000	66,000	24,000	36,000
4,200	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
4,370	6,000	66,000	24,000	36,000
4,400	6,000	66,000	24,000	36,000
4,500	6,000	66,000	24,000	36,000
4,600	6,000	66,000	24,000	36,000
4,650	6,000	66,000	24,000	36,000
4,700	6,000	66,000	24,000	36,000
4,760	6,000	66,000	28,000	36,000
4,800	6,000	66,000	28,000	36,000
4,900	6,000	66,000	28,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,160	6,000	66,000	28,000	36,000
5,200	6,000	66,000	28,000	36,000
5,300	6,000	66,000	28,000	36,000
5,400	6,000	66,000	28,000	36,000
5,500	6,000	66,000	28,000	36,000
5,550	6,000	66,000	28,000	36,000
5,560	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
5,700	6,000	66,000	28,000	36,000
5,800	6,000	66,000	28,000	36,000
5,900	6,000	66,000	28,000	36,000
5,950	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,100	8,000	79,000	34,000	36,000
6,200	8,000	79,000	34,000	36,000
6,300	8,000	79,000	34,000	36,000
6,350	8,000	79,000	34,000	36,000
6,400	8,000	79,000	34,000	36,000
6,500	8,000	79,000	34,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	79,000	34,000	36,000
6,700	8,000	79,000	34,000	36,000
6,750	8,000	79,000	34,000	36,000
6,800	8,000	79,000	34,000	36,000
6,900	8,000	79,000	34,000	36,000
7,000	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
7,140	8,000	79,000	41,000	36,000
7,200	8,000	79,000	41,000	36,000
7,300	8,000	79,000	41,000	36,000
7,400	8,000	79,000	41,000	36,000
7,500	8,000	79,000	41,000	36,000
7,540	8,000	79,000	41,000	36,000
7,600	8,000	79,000	41,000	36,000
7,700	8,000	79,000	41,000	36,000
7,800	8,000	79,000	41,000	36,000
7,900	8,000	79,000	41,000	36,000
7,940	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000
8,100	10,000	89,000	47,000	40,000
8,200	10,000	89,000	47,000	40,000
8,300	10,000	89,000	47,000	40,000
8,330	10,000	89,000	47,000	40,000
8,400	10,000	89,000	47,000	40,000
8,500	10,000	89,000	47,000	40,000
8,600	10,000	89,000	47,000	40,000
8,700	10,000	89,000	47,000	40,000
8,730	10,000	89,000	47,000	40,000
8,800	10,000	89,000	47,000	40,000
8,900	10,000	89,000	47,000	40,000
9,000	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
9,130	10,000	89,000	47,000	40,000
9,200	10,000	89,000	47,000	40,000
9,250	10,000	89,000	47,000	40,000
9,300	10,000	89,000	47,000	40,000
9,400	10,000	89,000	47,000	40,000
9,500	10,000	89,000	47,000	40,000
9,520	10,000	89,000	47,000	40,000
9,600	10,000	89,000	47,000	40,000
9,700	10,000	89,000	47,000	40,000
9,800	10,000	89,000	47,000	40,000
9,900	10,000	89,000	47,000	40,000
9,920	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,100	12,000	102,000	55,000	45,000
10,200	12,000	102,000	55,000	45,000
10,300	12,000	102,000	55,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	102,000	55,000	45,000	14,290	16,000	115,000	65,000	48,000
10,400	12,000	102,000	55,000	45,000	14,300	16,000	115,000	65,000	48,000
10,500	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
10,600	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	15,300	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,110	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	16,300	18,000	123,000	73,000	48,000
11,300	12,000	102,000	55,000	45,000	16,500	18,000	123,000	73,000	48,000
11,400	12,000	102,000	55,000	45,000	16,900	18,000	123,000	73,000	48,000
11,500	12,000	102,000	55,000	45,000	17,000	18,000	123,000	73,000	48,000
11,600	12,000	102,000	55,000	45,000	17,300	18,000	123,000	73,000	48,000
11,700	12,000	102,000	55,000	45,000	17,500	18,000	123,000	73,000	48,000
11,800	12,000	102,000	55,000	45,000	18,000	18,000	123,000	73,000	48,000
11,900	12,000	102,000	55,000	45,000	18,500	20,000	131,000	79,000	50,000
11,910	12,000	102,000	55,000	45,000	18,900	20,000	131,000	79,000	50,000
12,000	12,000	102,000	55,000	45,000	19,000	20,000	131,000	79,000	50,000
12,200	14,000	107,000	60,000	45,000	19,050	20,000	131,000	79,000	50,000
12,500	14,000	107,000	60,000	45,000	19,300	20,000	131,000	79,000	50,000
12,700	14,000	107,000	60,000	45,000	19,500	20,000	131,000	79,000	50,000
12,800	14,000	107,000	60,000	45,000	20,000	20,000	131,000	79,000	50,000
13,000	14,000	107,000	60,000	45,000					
13,300	14,000	107,000	60,000	45,000					
13,500	14,000	107,000	60,000	45,000					
13,700	14,000	107,000	60,000	45,000					
14,000	14,000	107,000	60,000	45,000					
14,200	16,000	115,000	65,000	48,000					

SuperV-Bohrer

SuperV-Bohrer ohne Innenkühlung



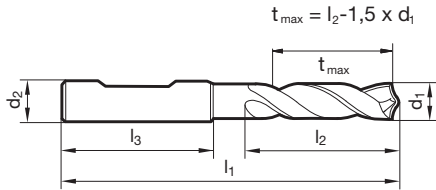
Katalog-Nr. 51687



P	M	K	N	S	H
●		●	○	○	○

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000
3,100	6,000	66,000	28,000	36,000
3,170	6,000	66,000	28,000	36,000
3,200	6,000	66,000	28,000	36,000
3,250	6,000	66,000	28,000	36,000
3,300	6,000	66,000	28,000	36,000
3,400	6,000	66,000	28,000	36,000
3,500	6,000	66,000	28,000	36,000
3,570	6,000	66,000	28,000	36,000
3,600	6,000	66,000	28,000	36,000
3,700	6,000	66,000	28,000	36,000
3,800	6,000	74,000	36,000	36,000
3,900	6,000	74,000	36,000	36,000
3,970	6,000	74,000	36,000	36,000
4,000	6,000	74,000	36,000	36,000
4,100	6,000	74,000	36,000	36,000
4,200	6,000	74,000	36,000	36,000
4,300	6,000	74,000	36,000	36,000
4,370	6,000	74,000	36,000	36,000
4,400	6,000	74,000	36,000	36,000
4,500	6,000	74,000	36,000	36,000
4,600	6,000	74,000	36,000	36,000
4,650	6,000	74,000	36,000	36,000
4,700	6,000	74,000	36,000	36,000
4,760	6,000	82,000	44,000	36,000
4,800	6,000	82,000	44,000	36,000
4,900	6,000	82,000	44,000	36,000
5,000	6,000	82,000	44,000	36,000
5,100	6,000	82,000	44,000	36,000
5,160	6,000	82,000	44,000	36,000
5,200	6,000	82,000	44,000	36,000
5,300	6,000	82,000	44,000	36,000
5,400	6,000	82,000	44,000	36,000
5,500	6,000	82,000	44,000	36,000
5,550	6,000	82,000	44,000	36,000
5,560	6,000	82,000	44,000	36,000
5,600	6,000	82,000	44,000	36,000
5,700	6,000	82,000	44,000	36,000
5,800	6,000	82,000	44,000	36,000
5,900	6,000	82,000	44,000	36,000
5,950	6,000	82,000	44,000	36,000
6,000	6,000	82,000	44,000	36,000
6,100	8,000	91,000	53,000	36,000
6,200	8,000	91,000	53,000	36,000
6,300	8,000	91,000	53,000	36,000
6,350	8,000	91,000	53,000	36,000
6,400	8,000	91,000	53,000	36,000
6,500	8,000	91,000	53,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	91,000	53,000	36,000
6,700	8,000	91,000	53,000	36,000
6,750	8,000	91,000	53,000	36,000
6,800	8,000	91,000	53,000	36,000
6,900	8,000	91,000	53,000	36,000
7,000	8,000	91,000	53,000	36,000
7,100	8,000	91,000	53,000	36,000
7,140	8,000	91,000	53,000	36,000
7,200	8,000	91,000	53,000	36,000
7,300	8,000	91,000	53,000	36,000
7,400	8,000	91,000	53,000	36,000
7,500	8,000	91,000	53,000	36,000
7,540	8,000	91,000	53,000	36,000
7,600	8,000	91,000	53,000	36,000
7,700	8,000	91,000	53,000	36,000
7,800	8,000	91,000	53,000	36,000
7,900	8,000	91,000	53,000	36,000
7,940	8,000	91,000	53,000	36,000
8,000	8,000	91,000	53,000	36,000
8,100	10,000	103,000	61,000	40,000
8,200	10,000	103,000	61,000	40,000
8,300	10,000	103,000	61,000	40,000
8,330	10,000	103,000	61,000	40,000
8,400	10,000	103,000	61,000	40,000
8,500	10,000	103,000	61,000	40,000
8,600	10,000	103,000	61,000	40,000
8,700	10,000	103,000	61,000	40,000
8,730	10,000	103,000	61,000	40,000
8,800	10,000	103,000	61,000	40,000
8,900	10,000	103,000	61,000	40,000
9,000	10,000	103,000	61,000	40,000
9,100	10,000	103,000	61,000	40,000
9,130	10,000	103,000	61,000	40,000
9,200	10,000	103,000	61,000	40,000
9,250	10,000	103,000	61,000	40,000
9,300	10,000	103,000	61,000	40,000
9,400	10,000	103,000	61,000	40,000
9,500	10,000	103,000	61,000	40,000
9,520	10,000	103,000	61,000	40,000
9,600	10,000	103,000	61,000	40,000
9,700	10,000	103,000	61,000	40,000
9,800	10,000	103,000	61,000	40,000
9,900	10,000	103,000	61,000	40,000
9,920	10,000	103,000	61,000	40,000
10,000	10,000	103,000	61,000	40,000
10,100	12,000	118,000	71,000	45,000
10,200	12,000	118,000	71,000	45,000
10,300	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	118,000	71,000	45,000	13,500	14,000	124,000	77,000	45,000
10,400	12,000	118,000	71,000	45,000	13,700	14,000	124,000	77,000	45,000
10,500	12,000	118,000	71,000	45,000	14,000	14,000	124,000	77,000	45,000
10,600	12,000	118,000	71,000	45,000	14,200	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,500	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	18,500	20,000	153,000	101,000	50,000
11,900	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
11,910	12,000	118,000	71,000	45,000	19,500	20,000	153,000	101,000	50,000
12,000	12,000	118,000	71,000	45,000	20,000	20,000	153,000	101,000	50,000
12,200	14,000	124,000	77,000	45,000					
12,500	14,000	124,000	77,000	45,000					
12,700	14,000	124,000	77,000	45,000					
13,000	14,000	124,000	77,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



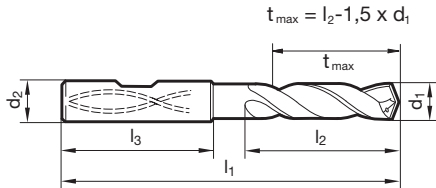
Katalog-Nr. 51676



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000	6,100	8,000	79,000	34,000	36,000
3,100	6,000	62,000	20,000	36,000	6,200	8,000	79,000	34,000	36,000
3,170	6,000	62,000	20,000	36,000	6,300	8,000	79,000	34,000	36,000
3,200	6,000	62,000	20,000	36,000	6,350	8,000	79,000	34,000	36,000
3,250	6,000	62,000	20,000	36,000	6,400	8,000	79,000	34,000	36,000
3,300	6,000	62,000	20,000	36,000	6,500	8,000	79,000	34,000	36,000
3,400	6,000	62,000	20,000	36,000	6,530	8,000	79,000	34,000	36,000
3,500	6,000	62,000	20,000	36,000	6,600	8,000	79,000	34,000	36,000
3,570	6,000	62,000	20,000	36,000	6,700	8,000	79,000	34,000	36,000
3,600	6,000	62,000	20,000	36,000	6,750	8,000	79,000	34,000	36,000
3,700	6,000	62,000	20,000	36,000	6,800	8,000	79,000	34,000	36,000
3,800	6,000	66,000	24,000	36,000	6,900	8,000	79,000	34,000	36,000
3,900	6,000	66,000	24,000	36,000	7,000	8,000	79,000	34,000	36,000
3,970	6,000	66,000	24,000	36,000	7,100	8,000	79,000	41,000	36,000
4,000	6,000	66,000	24,000	36,000	7,140	8,000	79,000	41,000	36,000
4,040	6,000	66,000	24,000	36,000	7,200	8,000	79,000	41,000	36,000
4,100	6,000	66,000	24,000	36,000	7,300	8,000	79,000	41,000	36,000
4,200	6,000	66,000	24,000	36,000	7,400	8,000	79,000	41,000	36,000
4,300	6,000	66,000	24,000	36,000	7,450	8,000	79,000	41,000	36,000
4,370	6,000	66,000	24,000	36,000	7,500	8,000	79,000	41,000	36,000
4,400	6,000	66,000	24,000	36,000	7,540	8,000	79,000	41,000	36,000
4,500	6,000	66,000	24,000	36,000	7,600	8,000	79,000	41,000	36,000
4,600	6,000	66,000	24,000	36,000	7,700	8,000	79,000	41,000	36,000
4,650	6,000	66,000	24,000	36,000	7,800	8,000	79,000	41,000	36,000
4,700	6,000	66,000	24,000	36,000	7,900	8,000	79,000	41,000	36,000
4,760	6,000	66,000	28,000	36,000	7,940	8,000	79,000	41,000	36,000
4,800	6,000	66,000	28,000	36,000	8,000	8,000	79,000	41,000	36,000
4,900	6,000	66,000	28,000	36,000	8,100	10,000	89,000	47,000	40,000
5,000	6,000	66,000	28,000	36,000	8,200	10,000	89,000	47,000	40,000
5,100	6,000	66,000	28,000	36,000	8,300	10,000	89,000	47,000	40,000
5,110	6,000	66,000	28,000	36,000	8,330	10,000	89,000	47,000	40,000
5,160	6,000	66,000	28,000	36,000	8,400	10,000	89,000	47,000	40,000
5,200	6,000	66,000	28,000	36,000	8,500	10,000	89,000	47,000	40,000
5,250	6,000	66,000	28,000	36,000	8,550	10,000	89,000	47,000	40,000
5,300	6,000	66,000	28,000	36,000	8,600	10,000	89,000	47,000	40,000
5,400	6,000	66,000	28,000	36,000	8,700	10,000	89,000	47,000	40,000
5,410	6,000	66,000	28,000	36,000	8,730	10,000	89,000	47,000	40,000
5,500	6,000	66,000	28,000	36,000	8,800	10,000	89,000	47,000	40,000
5,550	6,000	66,000	28,000	36,000	8,900	10,000	89,000	47,000	40,000
5,560	6,000	66,000	28,000	36,000	9,000	10,000	89,000	47,000	40,000
5,600	6,000	66,000	28,000	36,000	9,100	10,000	89,000	47,000	40,000
5,650	6,000	66,000	28,000	36,000	9,130	10,000	89,000	47,000	40,000
5,700	6,000	66,000	28,000	36,000	9,200	10,000	89,000	47,000	40,000
5,750	6,000	66,000	28,000	36,000	9,250	10,000	89,000	47,000	40,000
5,800	6,000	66,000	28,000	36,000	9,300	10,000	89,000	47,000	40,000
5,900	6,000	66,000	28,000	36,000	9,340	10,000	89,000	47,000	40,000
5,950	6,000	66,000	28,000	36,000	9,400	10,000	89,000	47,000	40,000
6,000	6,000	66,000	28,000	36,000	9,500	10,000	89,000	47,000	40,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



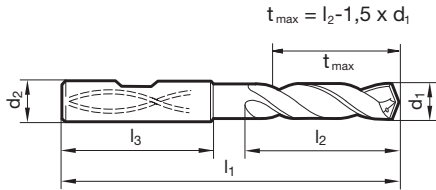
Katalog-Nr. 51670



P	M	K	N	S	H
	•			○	

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie
- besonders geeignet für rostfreie Stähle



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000
3,100	6,000	62,000	20,000	36,000
3,170	6,000	62,000	20,000	36,000
3,200	6,000	62,000	20,000	36,000
3,250	6,000	62,000	20,000	36,000
3,300	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
3,500	6,000	62,000	20,000	36,000
3,570	6,000	62,000	20,000	36,000
3,600	6,000	62,000	20,000	36,000
3,700	6,000	62,000	20,000	36,000
3,800	6,000	66,000	24,000	36,000
3,900	6,000	66,000	24,000	36,000
3,970	6,000	66,000	24,000	36,000
4,000	6,000	66,000	24,000	36,000
4,100	6,000	66,000	24,000	36,000
4,200	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
4,370	6,000	66,000	24,000	36,000
4,400	6,000	66,000	24,000	36,000
4,500	6,000	66,000	24,000	36,000
4,600	6,000	66,000	24,000	36,000
4,650	6,000	66,000	24,000	36,000
4,700	6,000	66,000	24,000	36,000
4,760	6,000	66,000	28,000	36,000
4,800	6,000	66,000	28,000	36,000
4,900	6,000	66,000	28,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,160	6,000	66,000	28,000	36,000
5,200	6,000	66,000	28,000	36,000
5,300	6,000	66,000	28,000	36,000
5,400	6,000	66,000	28,000	36,000
5,500	6,000	66,000	28,000	36,000
5,550	6,000	66,000	28,000	36,000
5,560	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
5,700	6,000	66,000	28,000	36,000
5,800	6,000	66,000	28,000	36,000
5,900	6,000	66,000	28,000	36,000
5,950	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,100	8,000	79,000	34,000	36,000
6,200	8,000	79,000	34,000	36,000
6,300	8,000	79,000	34,000	36,000
6,350	8,000	79,000	34,000	36,000
6,400	8,000	79,000	34,000	36,000
6,500	8,000	79,000	34,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	79,000	34,000	36,000
6,700	8,000	79,000	34,000	36,000
6,750	8,000	79,000	34,000	36,000
6,800	8,000	79,000	34,000	36,000
6,900	8,000	79,000	34,000	36,000
7,000	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
7,140	8,000	79,000	41,000	36,000
7,200	8,000	79,000	41,000	36,000
7,300	8,000	79,000	41,000	36,000
7,400	8,000	79,000	41,000	36,000
7,500	8,000	79,000	41,000	36,000
7,540	8,000	79,000	41,000	36,000
7,600	8,000	79,000	41,000	36,000
7,700	8,000	79,000	41,000	36,000
7,800	8,000	79,000	41,000	36,000
7,900	8,000	79,000	41,000	36,000
7,940	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000
8,100	10,000	89,000	47,000	40,000
8,200	10,000	89,000	47,000	40,000
8,300	10,000	89,000	47,000	40,000
8,330	10,000	89,000	47,000	40,000
8,400	10,000	89,000	47,000	40,000
8,500	10,000	89,000	47,000	40,000
8,600	10,000	89,000	47,000	40,000
8,700	10,000	89,000	47,000	40,000
8,730	10,000	89,000	47,000	40,000
8,800	10,000	89,000	47,000	40,000
8,900	10,000	89,000	47,000	40,000
9,000	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
9,130	10,000	89,000	47,000	40,000
9,200	10,000	89,000	47,000	40,000
9,250	10,000	89,000	47,000	40,000
9,300	10,000	89,000	47,000	40,000
9,400	10,000	89,000	47,000	40,000
9,500	10,000	89,000	47,000	40,000
9,520	10,000	89,000	47,000	40,000
9,600	10,000	89,000	47,000	40,000
9,700	10,000	89,000	47,000	40,000
9,800	10,000	89,000	47,000	40,000
9,900	10,000	89,000	47,000	40,000
9,920	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,100	12,000	102,000	55,000	45,000
10,200	12,000	102,000	55,000	45,000
10,300	12,000	102,000	55,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	102,000	55,000	45,000	13,500	14,000	107,000	60,000	45,000
10,400	12,000	102,000	55,000	45,000	13,700	14,000	107,000	60,000	45,000
10,500	12,000	102,000	55,000	45,000	14,000	14,000	107,000	60,000	45,000
10,600	12,000	102,000	55,000	45,000	14,200	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	14,290	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
11,110	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,300	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,400	12,000	102,000	55,000	45,000	16,500	18,000	123,000	73,000	48,000
11,500	12,000	102,000	55,000	45,000	17,000	18,000	123,000	73,000	48,000
11,600	12,000	102,000	55,000	45,000	17,500	18,000	123,000	73,000	48,000
11,700	12,000	102,000	55,000	45,000	18,000	18,000	123,000	73,000	48,000
11,800	12,000	102,000	55,000	45,000	18,500	20,000	131,000	79,000	50,000
11,900	12,000	102,000	55,000	45,000	19,000	20,000	131,000	79,000	50,000
11,910	12,000	102,000	55,000	45,000	19,500	20,000	131,000	79,000	50,000
12,000	12,000	102,000	55,000	45,000	20,000	20,000	131,000	79,000	50,000
12,200	14,000	107,000	60,000	45,000					
12,500	14,000	107,000	60,000	45,000					
12,700	14,000	107,000	60,000	45,000					
13,000	14,000	107,000	60,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



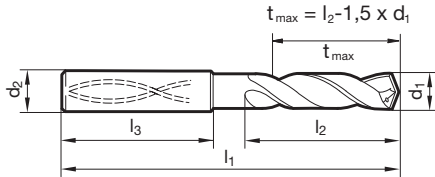
Katalog-Nr. 51784



P	M	K	N	S	H
●	○	○	○	○	○

Arbeitsrichtwerte
Seite 244

- Kegelmantelanschliff
- Hauptschneidenform konkav
- optimierte Schneidengeometrie
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000
3,100	6,000	62,000	20,000	36,000
3,170	6,000	62,000	20,000	36,000
3,200	6,000	62,000	20,000	36,000
3,250	6,000	62,000	20,000	36,000
3,300	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
3,500	6,000	62,000	20,000	36,000
3,570	6,000	62,000	20,000	36,000
3,600	6,000	62,000	20,000	36,000
3,700	6,000	62,000	20,000	36,000
3,800	6,000	66,000	24,000	36,000
3,900	6,000	66,000	24,000	36,000
3,970	6,000	66,000	24,000	36,000
4,000	6,000	66,000	24,000	36,000
4,040	6,000	66,000	24,000	36,000
4,100	6,000	66,000	24,000	36,000
4,200	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
4,370	6,000	66,000	24,000	36,000
4,400	6,000	66,000	24,000	36,000
4,500	6,000	66,000	24,000	36,000
4,600	6,000	66,000	24,000	36,000
4,650	6,000	66,000	24,000	36,000
4,700	6,000	66,000	24,000	36,000
4,760	6,000	66,000	28,000	36,000
4,800	6,000	66,000	28,000	36,000
4,900	6,000	66,000	28,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,110	6,000	66,000	28,000	36,000
5,160	6,000	66,000	28,000	36,000
5,200	6,000	66,000	28,000	36,000
5,300	6,000	66,000	28,000	36,000
5,400	6,000	66,000	28,000	36,000
5,410	6,000	66,000	28,000	36,000
5,500	6,000	66,000	28,000	36,000
5,550	6,000	66,000	28,000	36,000
5,560	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
5,700	6,000	66,000	28,000	36,000
5,800	6,000	66,000	28,000	36,000
5,900	6,000	66,000	28,000	36,000
5,950	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,100	8,000	79,000	34,000	36,000
6,200	8,000	79,000	34,000	36,000
6,300	8,000	79,000	34,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,350	8,000	79,000	34,000	36,000
6,400	8,000	79,000	34,000	36,000
6,500	8,000	79,000	34,000	36,000
6,530	8,000	79,000	34,000	36,000
6,550	8,000	79,000	34,000	36,000
6,600	8,000	79,000	34,000	36,000
6,700	8,000	79,000	34,000	36,000
6,750	8,000	79,000	34,000	36,000
6,800	8,000	79,000	34,000	36,000
6,900	8,000	79,000	34,000	36,000
7,000	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
7,140	8,000	79,000	41,000	36,000
7,200	8,000	79,000	41,000	36,000
7,300	8,000	79,000	41,000	36,000
7,400	8,000	79,000	41,000	36,000
7,500	8,000	79,000	41,000	36,000
7,540	8,000	79,000	41,000	36,000
7,550	8,000	79,000	41,000	36,000
7,600	8,000	79,000	41,000	36,000
7,650	8,000	79,000	41,000	36,000
7,700	8,000	79,000	41,000	36,000
7,800	8,000	79,000	41,000	36,000
7,900	8,000	79,000	41,000	36,000
7,940	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000
8,100	10,000	89,000	47,000	40,000
8,200	10,000	89,000	47,000	40,000
8,300	10,000	89,000	47,000	40,000
8,330	10,000	89,000	47,000	40,000
8,400	10,000	89,000	47,000	40,000
8,500	10,000	89,000	47,000	40,000
8,600	10,000	89,000	47,000	40,000
8,700	10,000	89,000	47,000	40,000
8,730	10,000	89,000	47,000	40,000
8,800	10,000	89,000	47,000	40,000
8,900	10,000	89,000	47,000	40,000
9,000	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
9,130	10,000	89,000	47,000	40,000
9,200	10,000	89,000	47,000	40,000
9,250	10,000	89,000	47,000	40,000
9,300	10,000	89,000	47,000	40,000
9,340	10,000	89,000	47,000	40,000
9,400	10,000	89,000	47,000	40,000
9,500	10,000	89,000	47,000	40,000
9,520	10,000	89,000	47,000	40,000
9,550	10,000	89,000	47,000	40,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



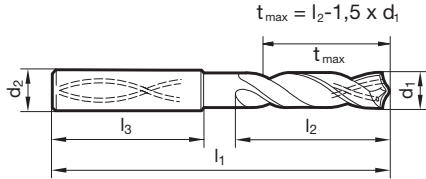
Katalog-Nr. 51752



P	M	K	N	S	H
●				●	○

Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \text{Ø } 3,000$
- Kegelmantelanschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000	6,600	8,000	79,000	34,000	36,000
3,100	6,000	62,000	20,000	36,000	6,700	8,000	79,000	34,000	36,000
3,170	6,000	62,000	20,000	36,000	6,750	8,000	79,000	34,000	36,000
3,200	6,000	62,000	20,000	36,000	6,800	8,000	79,000	34,000	36,000
3,250	6,000	62,000	20,000	36,000	6,900	8,000	79,000	34,000	36,000
3,300	6,000	62,000	20,000	36,000	7,000	8,000	79,000	34,000	36,000
3,400	6,000	62,000	20,000	36,000	7,100	8,000	79,000	41,000	36,000
3,500	6,000	62,000	20,000	36,000	7,140	8,000	79,000	41,000	36,000
3,570	6,000	62,000	20,000	36,000	7,200	8,000	79,000	41,000	36,000
3,600	6,000	62,000	20,000	36,000	7,300	8,000	79,000	41,000	36,000
3,700	6,000	62,000	20,000	36,000	7,400	8,000	79,000	41,000	36,000
3,800	6,000	66,000	24,000	36,000	7,500	8,000	79,000	41,000	36,000
3,900	6,000	66,000	24,000	36,000	7,540	8,000	79,000	41,000	36,000
3,970	6,000	66,000	24,000	36,000	7,600	8,000	79,000	41,000	36,000
4,000	6,000	66,000	24,000	36,000	7,700	8,000	79,000	41,000	36,000
4,100	6,000	66,000	24,000	36,000	7,800	8,000	79,000	41,000	36,000
4,200	6,000	66,000	24,000	36,000	7,900	8,000	79,000	41,000	36,000
4,300	6,000	66,000	24,000	36,000	7,940	8,000	79,000	41,000	36,000
4,370	6,000	66,000	24,000	36,000	8,000	8,000	79,000	41,000	36,000
4,400	6,000	66,000	24,000	36,000	8,100	10,000	89,000	47,000	40,000
4,500	6,000	66,000	24,000	36,000	8,200	10,000	89,000	47,000	40,000
4,600	6,000	66,000	24,000	36,000	8,300	10,000	89,000	47,000	40,000
4,650	6,000	66,000	24,000	36,000	8,330	10,000	89,000	47,000	40,000
4,700	6,000	66,000	24,000	36,000	8,400	10,000	89,000	47,000	40,000
4,760	6,000	66,000	28,000	36,000	8,500	10,000	89,000	47,000	40,000
4,800	6,000	66,000	28,000	36,000	8,600	10,000	89,000	47,000	40,000
4,900	6,000	66,000	28,000	36,000	8,700	10,000	89,000	47,000	40,000
5,000	6,000	66,000	28,000	36,000	8,730	10,000	89,000	47,000	40,000
5,100	6,000	66,000	28,000	36,000	8,800	10,000	89,000	47,000	40,000
5,160	6,000	66,000	28,000	36,000	8,900	10,000	89,000	47,000	40,000
5,200	6,000	66,000	28,000	36,000	9,000	10,000	89,000	47,000	40,000
5,300	6,000	66,000	28,000	36,000	9,100	10,000	89,000	47,000	40,000
5,400	6,000	66,000	28,000	36,000	9,130	10,000	89,000	47,000	40,000
5,500	6,000	66,000	28,000	36,000	9,200	10,000	89,000	47,000	40,000
5,550	6,000	66,000	28,000	36,000	9,250	10,000	89,000	47,000	40,000
5,560	6,000	66,000	28,000	36,000	9,300	10,000	89,000	47,000	40,000
5,600	6,000	66,000	28,000	36,000	9,400	10,000	89,000	47,000	40,000
5,700	6,000	66,000	28,000	36,000	9,500	10,000	89,000	47,000	40,000
5,800	6,000	66,000	28,000	36,000	9,520	10,000	89,000	47,000	40,000
5,900	6,000	66,000	28,000	36,000	9,600	10,000	89,000	47,000	40,000
5,950	6,000	66,000	28,000	36,000	9,700	10,000	89,000	47,000	40,000
6,000	6,000	66,000	28,000	36,000	9,800	10,000	89,000	47,000	40,000
6,100	8,000	79,000	34,000	36,000	9,900	10,000	89,000	47,000	40,000
6,200	8,000	79,000	34,000	36,000	9,920	10,000	89,000	47,000	40,000
6,300	8,000	79,000	34,000	36,000	10,000	10,000	89,000	47,000	40,000
6,350	8,000	79,000	34,000	36,000	10,100	12,000	102,000	55,000	45,000
6,400	8,000	79,000	34,000	36,000	10,200	12,000	102,000	55,000	45,000
6,500	8,000	79,000	34,000	36,000	10,300	12,000	102,000	55,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	102,000	55,000	45,000	13,500	14,000	107,000	60,000	45,000
10,400	12,000	102,000	55,000	45,000	13,700	14,000	107,000	60,000	45,000
10,500	12,000	102,000	55,000	45,000	14,000	14,000	107,000	60,000	45,000
10,600	12,000	102,000	55,000	45,000	14,200	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	14,290	16,000	115,000	65,000	48,000
10,720	12,000	102,000	55,000	45,000	14,300	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
11,110	12,000	102,000	55,000	45,000	15,300	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,300	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,400	12,000	102,000	55,000	45,000	15,870	16,000	115,000	65,000	48,000
11,500	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,510	12,000	102,000	55,000	45,000	16,300	18,000	123,000	73,000	48,000
11,600	12,000	102,000	55,000	45,000	16,500	18,000	123,000	73,000	48,000
11,700	12,000	102,000	55,000	45,000	16,900	18,000	123,000	73,000	48,000
11,800	12,000	102,000	55,000	45,000	17,000	18,000	123,000	73,000	48,000
11,900	12,000	102,000	55,000	45,000	17,300	18,000	123,000	73,000	48,000
11,910	12,000	102,000	55,000	45,000	17,500	18,000	123,000	73,000	48,000
12,000	12,000	102,000	55,000	45,000	18,000	18,000	123,000	73,000	48,000
12,200	14,000	107,000	60,000	45,000	18,500	20,000	131,000	79,000	50,000
12,300	14,000	107,000	60,000	45,000	18,900	20,000	131,000	79,000	50,000
12,500	14,000	107,000	60,000	45,000	19,000	20,000	131,000	79,000	50,000
12,700	14,000	107,000	60,000	45,000	19,050	20,000	131,000	79,000	50,000
12,800	14,000	107,000	60,000	45,000	19,300	20,000	131,000	79,000	50,000
13,000	14,000	107,000	60,000	45,000	19,500	20,000	131,000	79,000	50,000
13,300	14,000	107,000	60,000	45,000	20,000	20,000	131,000	79,000	50,000
13,490	14,000	107,000	60,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



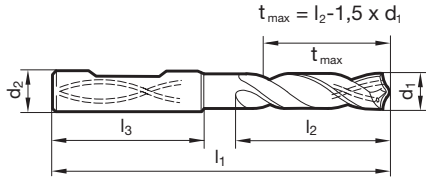
Katalog-Nr. 51753



P	M	K	N	S	H
●				●	○

Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelanschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000	6,600	8,000	79,000	34,000	36,000
3,100	6,000	62,000	20,000	36,000	6,700	8,000	79,000	34,000	36,000
3,170	6,000	62,000	20,000	36,000	6,750	8,000	79,000	34,000	36,000
3,200	6,000	62,000	20,000	36,000	6,800	8,000	79,000	34,000	36,000
3,250	6,000	62,000	20,000	36,000	6,900	8,000	79,000	34,000	36,000
3,300	6,000	62,000	20,000	36,000	7,000	8,000	79,000	34,000	36,000
3,400	6,000	62,000	20,000	36,000	7,100	8,000	79,000	41,000	36,000
3,500	6,000	62,000	20,000	36,000	7,140	8,000	79,000	41,000	36,000
3,570	6,000	62,000	20,000	36,000	7,200	8,000	79,000	41,000	36,000
3,600	6,000	62,000	20,000	36,000	7,300	8,000	79,000	41,000	36,000
3,700	6,000	62,000	20,000	36,000	7,400	8,000	79,000	41,000	36,000
3,800	6,000	66,000	24,000	36,000	7,500	8,000	79,000	41,000	36,000
3,900	6,000	66,000	24,000	36,000	7,540	8,000	79,000	41,000	36,000
3,970	6,000	66,000	24,000	36,000	7,600	8,000	79,000	41,000	36,000
4,000	6,000	66,000	24,000	36,000	7,700	8,000	79,000	41,000	36,000
4,100	6,000	66,000	24,000	36,000	7,800	8,000	79,000	41,000	36,000
4,200	6,000	66,000	24,000	36,000	7,900	8,000	79,000	41,000	36,000
4,300	6,000	66,000	24,000	36,000	7,940	8,000	79,000	41,000	36,000
4,370	6,000	66,000	24,000	36,000	8,000	8,000	79,000	41,000	36,000
4,400	6,000	66,000	24,000	36,000	8,100	10,000	89,000	47,000	40,000
4,500	6,000	66,000	24,000	36,000	8,200	10,000	89,000	47,000	40,000
4,600	6,000	66,000	24,000	36,000	8,300	10,000	89,000	47,000	40,000
4,650	6,000	66,000	24,000	36,000	8,330	10,000	89,000	47,000	40,000
4,700	6,000	66,000	24,000	36,000	8,400	10,000	89,000	47,000	40,000
4,760	6,000	66,000	28,000	36,000	8,500	10,000	89,000	47,000	40,000
4,800	6,000	66,000	28,000	36,000	8,600	10,000	89,000	47,000	40,000
4,900	6,000	66,000	28,000	36,000	8,700	10,000	89,000	47,000	40,000
5,000	6,000	66,000	28,000	36,000	8,730	10,000	89,000	47,000	40,000
5,100	6,000	66,000	28,000	36,000	8,800	10,000	89,000	47,000	40,000
5,160	6,000	66,000	28,000	36,000	8,900	10,000	89,000	47,000	40,000
5,200	6,000	66,000	28,000	36,000	9,000	10,000	89,000	47,000	40,000
5,300	6,000	66,000	28,000	36,000	9,100	10,000	89,000	47,000	40,000
5,400	6,000	66,000	28,000	36,000	9,130	10,000	89,000	47,000	40,000
5,500	6,000	66,000	28,000	36,000	9,200	10,000	89,000	47,000	40,000
5,550	6,000	66,000	28,000	36,000	9,250	10,000	89,000	47,000	40,000
5,560	6,000	66,000	28,000	36,000	9,300	10,000	89,000	47,000	40,000
5,600	6,000	66,000	28,000	36,000	9,400	10,000	89,000	47,000	40,000
5,700	6,000	66,000	28,000	36,000	9,500	10,000	89,000	47,000	40,000
5,800	6,000	66,000	28,000	36,000	9,520	10,000	89,000	47,000	40,000
5,900	6,000	66,000	28,000	36,000	9,600	10,000	89,000	47,000	40,000
5,950	6,000	66,000	28,000	36,000	9,700	10,000	89,000	47,000	40,000
6,000	6,000	66,000	28,000	36,000	9,800	10,000	89,000	47,000	40,000
6,100	8,000	79,000	34,000	36,000	9,900	10,000	89,000	47,000	40,000
6,200	8,000	79,000	34,000	36,000	9,920	10,000	89,000	47,000	40,000
6,300	8,000	79,000	34,000	36,000	10,000	10,000	89,000	47,000	40,000
6,350	8,000	79,000	34,000	36,000	10,100	12,000	102,000	55,000	45,000
6,400	8,000	79,000	34,000	36,000	10,200	12,000	102,000	55,000	45,000
6,500	8,000	79,000	34,000	36,000	10,300	12,000	102,000	55,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	102,000	55,000	45,000	14,290	16,000	115,000	65,000	48,000
10,400	12,000	102,000	55,000	45,000	14,300	16,000	115,000	65,000	48,000
10,500	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
10,600	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	15,300	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,110	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	16,300	18,000	123,000	73,000	48,000
11,300	12,000	102,000	55,000	45,000	16,500	18,000	123,000	73,000	48,000
11,400	12,000	102,000	55,000	45,000	16,900	18,000	123,000	73,000	48,000
11,500	12,000	102,000	55,000	45,000	17,000	18,000	123,000	73,000	48,000
11,600	12,000	102,000	55,000	45,000	17,300	18,000	123,000	73,000	48,000
11,700	12,000	102,000	55,000	45,000	17,500	18,000	123,000	73,000	48,000
11,800	12,000	102,000	55,000	45,000	18,000	18,000	123,000	73,000	48,000
11,900	12,000	102,000	55,000	45,000	18,500	20,000	131,000	79,000	50,000
11,910	12,000	102,000	55,000	45,000	18,900	20,000	131,000	79,000	50,000
12,000	12,000	102,000	55,000	45,000	19,000	20,000	131,000	79,000	50,000
12,200	14,000	107,000	60,000	45,000	19,050	20,000	131,000	79,000	50,000
12,500	14,000	107,000	60,000	45,000	19,300	20,000	131,000	79,000	50,000
12,700	14,000	107,000	60,000	45,000	19,500	20,000	131,000	79,000	50,000
12,800	14,000	107,000	60,000	45,000	20,000	20,000	131,000	79,000	50,000
13,000	14,000	107,000	60,000	45,000					
13,300	14,000	107,000	60,000	45,000					
13,500	14,000	107,000	60,000	45,000					
13,700	14,000	107,000	60,000	45,000					
14,000	14,000	107,000	60,000	45,000					
14,200	16,000	115,000	65,000	48,000					

SuperV-Bohrer

Pilotbohrer mit Kühlkanälen



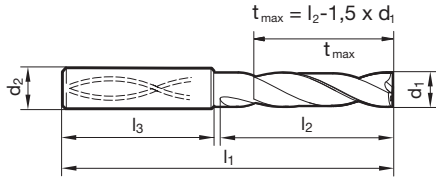
Katalog-Nr. 51718



P	M	K	N	S	H
●	●	●	○	○	○

Arbeitsrichtwerte
Seite 244

- 180° Spitzenanschliff für ebenen Bohrungsgrund
- zum Pilotieren, Bohren, Anspiegeln
- geringe Gratbildung
- Pilotieren in allen Lagen und Werkstoffen



d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	61,000	16,000	36,000
3,100		6,000	61,000	16,000	36,000
3,170	1/8	6,000	61,000	16,000	36,000
3,200		6,000	61,000	16,000	36,000
3,250		6,000	61,000	16,000	36,000
3,300		6,000	61,000	16,000	36,000
3,400		6,000	61,000	16,000	36,000
3,500		6,000	61,000	16,000	36,000
3,570	9/64	6,000	61,000	16,000	36,000
3,600		6,000	61,000	16,000	36,000
3,700		6,000	61,000	16,000	36,000
3,800		6,000	65,000	18,000	36,000
3,900		6,000	65,000	18,000	36,000
3,970	5/32	6,000	65,000	18,000	36,000
4,000		6,000	65,000	18,000	36,000
4,040		6,000	65,000	18,000	36,000
4,100		6,000	65,000	18,000	36,000
4,200		6,000	65,000	18,000	36,000
4,300		6,000	65,000	21,000	36,000
4,370	11/64	6,000	65,000	21,000	36,000
4,400		6,000	65,000	21,000	36,000
4,500		6,000	65,000	21,000	36,000
4,600		6,000	65,000	21,000	36,000
4,650		6,000	65,000	21,000	36,000
4,700		6,000	65,000	21,000	36,000
4,760	3/16	6,000	65,000	26,000	36,000
4,800		6,000	65,000	26,000	36,000
4,900		6,000	65,000	26,000	36,000
5,000		6,000	65,000	26,000	36,000
5,100		6,000	65,000	26,000	36,000
5,110		6,000	65,000	26,000	36,000
5,160	13/64	6,000	65,000	26,000	36,000
5,200		6,000	65,000	26,000	36,000
5,300		6,000	65,000	26,000	36,000
5,400		6,000	65,000	26,000	36,000
5,410		6,000	65,000	26,000	36,000
5,500		6,000	65,000	26,000	36,000
5,550		6,000	65,000	26,000	36,000
5,560	7/32	6,000	65,000	26,000	36,000
5,600		6,000	65,000	26,000	36,000
5,700		6,000	65,000	26,000	36,000
5,800		6,000	65,000	26,000	36,000
5,900		6,000	65,000	26,000	36,000
5,950	15/64	6,000	65,000	26,000	36,000
6,000		6,000	65,000	26,000	36,000
6,100		8,000	78,000	31,000	36,000
6,200		8,000	78,000	31,000	36,000
6,300		8,000	78,000	31,000	36,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
6,350	1/4	8,000	78,000	31,000	36,000
6,400		8,000	78,000	31,000	36,000
6,500		8,000	78,000	31,000	36,000
6,530		8,000	78,000	31,000	36,000
6,550		8,000	78,000	31,000	36,000
6,600		8,000	78,000	31,000	36,000
6,700		8,000	78,000	31,000	36,000
6,750	17/64	8,000	78,000	31,000	36,000
6,800		8,000	78,000	31,000	36,000
6,900		8,000	78,000	31,000	36,000
7,000		8,000	78,000	31,000	36,000
7,100		8,000	78,000	35,000	36,000
7,140	9/32	8,000	78,000	35,000	36,000
7,200		8,000	78,000	35,000	36,000
7,300		8,000	78,000	35,000	36,000
7,400		8,000	78,000	35,000	36,000
7,500		8,000	78,000	35,000	36,000
7,540	19/64	8,000	78,000	35,000	36,000
7,550		8,000	78,000	35,000	36,000
7,600		8,000	78,000	35,000	36,000
7,650		8,000	78,000	35,000	36,000
7,700		8,000	78,000	35,000	36,000
7,800		8,000	78,000	35,000	36,000
7,900		8,000	78,000	35,000	36,000
7,940	5/16	8,000	78,000	35,000	36,000
8,000		8,000	78,000	35,000	36,000
8,100		10,000	87,000	43,000	40,000
8,200		10,000	87,000	43,000	40,000
8,300		10,000	87,000	43,000	40,000
8,330	21/64	10,000	87,000	43,000	40,000
8,400		10,000	87,000	43,000	40,000
8,500		10,000	87,000	43,000	40,000
8,600		10,000	87,000	43,000	40,000
8,700		10,000	87,000	43,000	40,000
8,730	11/32	10,000	87,000	43,000	40,000
8,800		10,000	87,000	43,000	40,000
8,900		10,000	87,000	43,000	40,000
9,000		10,000	87,000	43,000	40,000
9,100		10,000	87,000	43,000	40,000
9,130	23/64	10,000	87,000	43,000	40,000
9,200		10,000	87,000	43,000	40,000
9,250		10,000	87,000	43,000	40,000
9,300		10,000	87,000	43,000	40,000
9,340		10,000	87,000	43,000	40,000
9,400		10,000	87,000	43,000	40,000
9,500		10,000	87,000	43,000	40,000
9,520	3/8	10,000	87,000	43,000	40,000
9,550		10,000	87,000	43,000	40,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
9,600		10,000	87,000	43,000	40,000	14,600		16,000	112,000	62,000	48,000
9,700		10,000	87,000	43,000	40,000	14,680	37/64	16,000	112,000	62,000	48,000
9,800		10,000	87,000	43,000	40,000	14,700		16,000	112,000	62,000	48,000
9,900		10,000	87,000	43,000	40,000	14,800		16,000	112,000	62,000	48,000
9,920	25/64	10,000	87,000	43,000	40,000	14,900		16,000	112,000	62,000	48,000
10,000		10,000	87,000	43,000	40,000	15,000		16,000	112,000	62,000	48,000
10,100		12,000	100,000	52,000	45,000	15,080	19/32	16,000	112,000	62,000	48,000
10,200		12,000	100,000	52,000	45,000	15,100		16,000	112,000	62,000	48,000
10,300		12,000	100,000	52,000	45,000	15,200		16,000	112,000	62,000	48,000
10,320	13/32	12,000	100,000	52,000	45,000	15,300		16,000	112,000	62,000	48,000
10,400		12,000	100,000	52,000	45,000	15,400		16,000	112,000	62,000	48,000
10,500		12,000	100,000	52,000	45,000	15,480	39/64	16,000	112,000	62,000	48,000
10,600		12,000	100,000	52,000	45,000	15,500		16,000	112,000	62,000	48,000
10,700		12,000	100,000	52,000	45,000	15,550		16,000	112,000	62,000	48,000
10,720	27/64	12,000	100,000	52,000	45,000	15,600		16,000	112,000	62,000	48,000
10,800		12,000	100,000	52,000	45,000	15,700		16,000	112,000	62,000	48,000
10,900		12,000	100,000	52,000	45,000	15,800		16,000	112,000	62,000	48,000
11,000		12,000	100,000	52,000	45,000	15,870	5/8	16,000	112,000	62,000	48,000
11,100		12,000	100,000	52,000	45,000	15,900		16,000	112,000	62,000	48,000
11,110	7/16	12,000	100,000	52,000	45,000	16,000		16,000	112,000	62,000	48,000
11,200		12,000	100,000	52,000	45,000	16,270	41/64	18,000	120,000	70,000	48,000
11,300		12,000	100,000	52,000	45,000	16,300		18,000	120,000	70,000	48,000
11,400		12,000	100,000	52,000	45,000	16,500		18,000	120,000	70,000	48,000
11,500		12,000	100,000	52,000	45,000	16,670	21/32	18,000	120,000	70,000	48,000
11,510	29/64	12,000	100,000	52,000	45,000	16,700		18,000	120,000	70,000	48,000
11,550		12,000	100,000	52,000	45,000	16,900		18,000	120,000	70,000	48,000
11,600		12,000	100,000	52,000	45,000	17,000		18,000	120,000	70,000	48,000
11,700		12,000	100,000	52,000	45,000	17,070	43/64	18,000	120,000	70,000	48,000
11,800		12,000	100,000	52,000	45,000	17,460	11/16	18,000	120,000	70,000	48,000
11,900		12,000	100,000	52,000	45,000	17,500		18,000	120,000	70,000	48,000
11,910	15/32	12,000	100,000	52,000	45,000	17,550		18,000	120,000	70,000	48,000
12,000		12,000	100,000	52,000	45,000	17,700		18,000	120,000	70,000	48,000
12,100		14,000	104,000	57,000	45,000	17,860	45/64	18,000	120,000	70,000	48,000
12,200		14,000	104,000	57,000	45,000	18,000		18,000	120,000	70,000	48,000
12,300	31/64	14,000	104,000	57,000	45,000	18,260	23/32	20,000	128,000	76,000	50,000
12,400		14,000	104,000	57,000	45,000	18,500		20,000	128,000	76,000	50,000
12,500		14,000	104,000	57,000	45,000	18,700		20,000	128,000	76,000	50,000
12,600		14,000	104,000	57,000	45,000	18,900		20,000	128,000	76,000	50,000
12,700	1/2	14,000	104,000	57,000	45,000	19,000		20,000	128,000	76,000	50,000
12,800		14,000	104,000	57,000	45,000	19,050	3/4	20,000	128,000	76,000	50,000
12,900		14,000	104,000	57,000	45,000	19,250		20,000	128,000	76,000	50,000
13,000		14,000	104,000	57,000	45,000	19,300		20,000	128,000	76,000	50,000
13,100	33/64	14,000	104,000	57,000	45,000	19,450	49/64	20,000	128,000	76,000	50,000
13,200		14,000	104,000	57,000	45,000	19,500		20,000	128,000	76,000	50,000
13,300		14,000	104,000	57,000	45,000	19,550		20,000	128,000	76,000	50,000
13,400		14,000	104,000	57,000	45,000	19,700		20,000	128,000	76,000	50,000
13,490	17/32	14,000	104,000	57,000	45,000	19,800		20,000	128,000	76,000	50,000
13,500		14,000	104,000	57,000	45,000	19,840	25/32	20,000	128,000	76,000	50,000
13,600		14,000	104,000	57,000	45,000	20,000		20,000	128,000	76,000	50,000
13,700		14,000	104,000	57,000	45,000						
13,800		14,000	104,000	57,000	45,000						
13,890	35/64	14,000	104,000	57,000	45,000						
13,900		14,000	104,000	57,000	45,000						
14,000		14,000	104,000	57,000	45,000						
14,100		16,000	112,000	62,000	48,000						
14,200		16,000	112,000	62,000	48,000						
14,290	9/16	16,000	112,000	62,000	48,000						
14,300		16,000	112,000	62,000	48,000						
14,400		16,000	112,000	62,000	48,000						
14,500		16,000	112,000	62,000	48,000						

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung

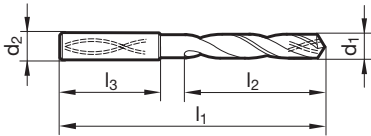


Katalog-Nr. 71791



Arbeitsrichtwerte
Seite 240

- Kegelmantelanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie
- scharfes Schnittverhalten



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	6,600	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	6,700	8,000	91,000	53,000	36,000
3,170	6,000	66,000	28,000	36,000	6,750	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	6,800	8,000	91,000	53,000	36,000
3,250	6,000	66,000	28,000	36,000	6,900	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	7,000	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	7,100	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	7,140	8,000	91,000	53,000	36,000
3,570	6,000	66,000	28,000	36,000	7,200	8,000	91,000	53,000	36,000
3,600	6,000	66,000	28,000	36,000	7,300	8,000	91,000	53,000	36,000
3,700	6,000	66,000	28,000	36,000	7,400	8,000	91,000	53,000	36,000
3,800	6,000	74,000	36,000	36,000	7,500	8,000	91,000	53,000	36,000
3,900	6,000	74,000	36,000	36,000	7,540	8,000	91,000	53,000	36,000
3,970	6,000	74,000	36,000	36,000	7,600	8,000	91,000	53,000	36,000
4,000	6,000	74,000	36,000	36,000	7,700	8,000	91,000	53,000	36,000
4,100	6,000	74,000	36,000	36,000	7,800	8,000	91,000	53,000	36,000
4,200	6,000	74,000	36,000	36,000	7,900	8,000	91,000	53,000	36,000
4,300	6,000	74,000	36,000	36,000	7,940	8,000	91,000	53,000	36,000
4,370	6,000	74,000	36,000	36,000	8,000	8,000	91,000	53,000	36,000
4,400	6,000	74,000	36,000	36,000	8,100	10,000	103,000	61,000	40,000
4,500	6,000	74,000	36,000	36,000	8,200	10,000	103,000	61,000	40,000
4,600	6,000	74,000	36,000	36,000	8,300	10,000	103,000	61,000	40,000
4,650	6,000	74,000	36,000	36,000	8,330	10,000	103,000	61,000	40,000
4,700	6,000	74,000	36,000	36,000	8,400	10,000	103,000	61,000	40,000
4,760	6,000	82,000	44,000	36,000	8,500	10,000	103,000	61,000	40,000
4,800	6,000	82,000	44,000	36,000	8,600	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	8,700	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	8,730	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	8,800	10,000	103,000	61,000	40,000
5,160	6,000	82,000	44,000	36,000	8,900	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	9,000	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	9,100	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	9,130	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	9,200	10,000	103,000	61,000	40,000
5,550	6,000	82,000	44,000	36,000	9,250	10,000	103,000	61,000	40,000
5,560	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
5,600	6,000	82,000	44,000	36,000	9,340	10,000	103,000	61,000	40,000
5,700	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
5,800	6,000	82,000	44,000	36,000	9,500	10,000	103,000	61,000	40,000
5,900	6,000	82,000	44,000	36,000	9,520	10,000	103,000	61,000	40,000
5,950	6,000	82,000	44,000	36,000	9,600	10,000	103,000	61,000	40,000
6,000	6,000	82,000	44,000	36,000	9,700	10,000	103,000	61,000	40,000
6,100	8,000	91,000	53,000	36,000	9,800	10,000	103,000	61,000	40,000
6,200	8,000	91,000	53,000	36,000	9,900	10,000	103,000	61,000	40,000
6,300	8,000	91,000	53,000	36,000	9,920	10,000	103,000	61,000	40,000
6,350	8,000	91,000	53,000	36,000	10,000	10,000	103,000	61,000	40,000
6,400	8,000	91,000	53,000	36,000	10,100	12,000	118,000	71,000	45,000
6,500	8,000	91,000	53,000	36,000	10,200	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,300	12,000	118,000	71,000	45,000	14,100	16,000	133,000	83,000	48,000
10,320	12,000	118,000	71,000	45,000	14,200	16,000	133,000	83,000	48,000
10,400	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,500	12,000	118,000	71,000	45,000	14,300	16,000	133,000	83,000	48,000
10,600	12,000	118,000	71,000	45,000	14,400	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	14,800	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,100	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,300	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,500	12,000	118,000	71,000	45,000	15,800	16,000	133,000	83,000	48,000
11,600	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,700	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	16,700	18,000	143,000	93,000	48,000
11,900	12,000	118,000	71,000	45,000	16,900	18,000	143,000	93,000	48,000
11,910	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
12,000	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
12,100	14,000	124,000	77,000	45,000	17,700	18,000	143,000	93,000	48,000
12,200	14,000	124,000	77,000	45,000	18,000	18,000	143,000	93,000	48,000
12,500	14,000	124,000	77,000	45,000	18,500	20,000	153,000	101,000	50,000
12,600	14,000	124,000	77,000	45,000	18,900	20,000	153,000	101,000	50,000
12,700	14,000	124,000	77,000	45,000	19,000	20,000	153,000	101,000	50,000
12,800	14,000	124,000	77,000	45,000	19,050	20,000	153,000	101,000	50,000
12,900	14,000	124,000	77,000	45,000	19,300	20,000	153,000	101,000	50,000
13,000	14,000	124,000	77,000	45,000	19,500	20,000	153,000	101,000	50,000
13,100	14,000	124,000	77,000	45,000	20,000	20,000	153,000	101,000	50,000
13,300	14,000	124,000	77,000	45,000					
13,400	14,000	124,000	77,000	45,000					
13,500	14,000	124,000	77,000	45,000					
13,700	14,000	124,000	77,000	45,000					
13,800	14,000	124,000	77,000	45,000					
14,000	14,000	124,000	77,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



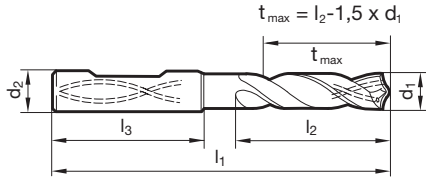
Katalog-Nr. 51681



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	6,600	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	6,700	8,000	91,000	53,000	36,000
3,170	6,000	66,000	28,000	36,000	6,750	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	6,800	8,000	91,000	53,000	36,000
3,250	6,000	66,000	28,000	36,000	6,900	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	7,000	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	7,100	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	7,140	8,000	91,000	53,000	36,000
3,570	6,000	66,000	28,000	36,000	7,200	8,000	91,000	53,000	36,000
3,600	6,000	66,000	28,000	36,000	7,300	8,000	91,000	53,000	36,000
3,700	6,000	66,000	28,000	36,000	7,400	8,000	91,000	53,000	36,000
3,800	6,000	74,000	36,000	36,000	7,500	8,000	91,000	53,000	36,000
3,900	6,000	74,000	36,000	36,000	7,540	8,000	91,000	53,000	36,000
3,970	6,000	74,000	36,000	36,000	7,600	8,000	91,000	53,000	36,000
4,000	6,000	74,000	36,000	36,000	7,700	8,000	91,000	53,000	36,000
4,100	6,000	74,000	36,000	36,000	7,800	8,000	91,000	53,000	36,000
4,200	6,000	74,000	36,000	36,000	7,900	8,000	91,000	53,000	36,000
4,300	6,000	74,000	36,000	36,000	7,940	8,000	91,000	53,000	36,000
4,370	6,000	74,000	36,000	36,000	8,000	8,000	91,000	53,000	36,000
4,400	6,000	74,000	36,000	36,000	8,100	10,000	103,000	61,000	40,000
4,500	6,000	74,000	36,000	36,000	8,200	10,000	103,000	61,000	40,000
4,600	6,000	74,000	36,000	36,000	8,300	10,000	103,000	61,000	40,000
4,650	6,000	74,000	36,000	36,000	8,330	10,000	103,000	61,000	40,000
4,700	6,000	74,000	36,000	36,000	8,400	10,000	103,000	61,000	40,000
4,760	6,000	82,000	44,000	36,000	8,500	10,000	103,000	61,000	40,000
4,800	6,000	82,000	44,000	36,000	8,600	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	8,700	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	8,730	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	8,800	10,000	103,000	61,000	40,000
5,160	6,000	82,000	44,000	36,000	8,900	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	9,000	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	9,100	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	9,130	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	9,200	10,000	103,000	61,000	40,000
5,550	6,000	82,000	44,000	36,000	9,250	10,000	103,000	61,000	40,000
5,560	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
5,600	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
5,700	6,000	82,000	44,000	36,000	9,500	10,000	103,000	61,000	40,000
5,800	6,000	82,000	44,000	36,000	9,520	10,000	103,000	61,000	40,000
5,900	6,000	82,000	44,000	36,000	9,600	10,000	103,000	61,000	40,000
5,950	6,000	82,000	44,000	36,000	9,700	10,000	103,000	61,000	40,000
6,000	6,000	82,000	44,000	36,000	9,800	10,000	103,000	61,000	40,000
6,100	8,000	91,000	53,000	36,000	9,900	10,000	103,000	61,000	40,000
6,200	8,000	91,000	53,000	36,000	9,920	10,000	103,000	61,000	40,000
6,300	8,000	91,000	53,000	36,000	10,000	10,000	103,000	61,000	40,000
6,350	8,000	91,000	53,000	36,000	10,100	12,000	118,000	71,000	45,000
6,400	8,000	91,000	53,000	36,000	10,200	12,000	118,000	71,000	45,000
6,500	8,000	91,000	53,000	36,000	10,300	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	118,000	71,000	45,000	13,500	14,000	124,000	77,000	45,000
10,400	12,000	118,000	71,000	45,000	13,700	14,000	124,000	77,000	45,000
10,500	12,000	118,000	71,000	45,000	14,000	14,000	124,000	77,000	45,000
10,600	12,000	118,000	71,000	45,000	14,200	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,500	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	18,500	20,000	153,000	101,000	50,000
11,900	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
11,910	12,000	118,000	71,000	45,000	19,050	20,000	153,000	101,000	50,000
12,000	12,000	118,000	71,000	45,000	19,500	20,000	153,000	101,000	50,000
12,200	14,000	124,000	77,000	45,000	20,000	20,000	153,000	101,000	50,000
12,500	14,000	124,000	77,000	45,000					
12,700	14,000	124,000	77,000	45,000					
13,000	14,000	124,000	77,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



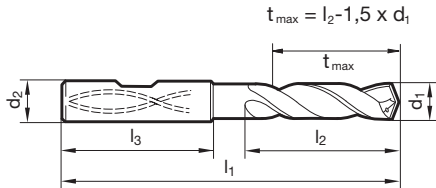
Katalog-Nr. 51674



P	M	K	N	S	H
	•			○	

Arbeitsrichtwerte
Seite 240

- Flächenanschliff
- Hauptschneidenform gerade
- optimierte Schneidengeometrie
- besonders geeignet für rostfreie Stähle



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000
3,100	6,000	66,000	28,000	36,000
3,170	6,000	66,000	28,000	36,000
3,200	6,000	66,000	28,000	36,000
3,250	6,000	66,000	28,000	36,000
3,300	6,000	66,000	28,000	36,000
3,400	6,000	66,000	28,000	36,000
3,500	6,000	66,000	28,000	36,000
3,570	6,000	66,000	28,000	36,000
3,600	6,000	66,000	28,000	36,000
3,700	6,000	66,000	28,000	36,000
3,800	6,000	74,000	36,000	36,000
3,900	6,000	74,000	36,000	36,000
3,970	6,000	74,000	36,000	36,000
4,000	6,000	74,000	36,000	36,000
4,100	6,000	74,000	36,000	36,000
4,200	6,000	74,000	36,000	36,000
4,300	6,000	74,000	36,000	36,000
4,370	6,000	74,000	36,000	36,000
4,400	6,000	74,000	36,000	36,000
4,500	6,000	74,000	36,000	36,000
4,600	6,000	74,000	36,000	36,000
4,650	6,000	74,000	36,000	36,000
4,700	6,000	74,000	36,000	36,000
4,760	6,000	82,000	44,000	36,000
4,800	6,000	82,000	44,000	36,000
4,900	6,000	82,000	44,000	36,000
5,000	6,000	82,000	44,000	36,000
5,100	6,000	82,000	44,000	36,000
5,160	6,000	82,000	44,000	36,000
5,200	6,000	82,000	44,000	36,000
5,300	6,000	82,000	44,000	36,000
5,400	6,000	82,000	44,000	36,000
5,500	6,000	82,000	44,000	36,000
5,550	6,000	82,000	44,000	36,000
5,560	6,000	82,000	44,000	36,000
5,600	6,000	82,000	44,000	36,000
5,700	6,000	82,000	44,000	36,000
5,800	6,000	82,000	44,000	36,000
5,900	6,000	82,000	44,000	36,000
5,950	6,000	82,000	44,000	36,000
6,000	6,000	82,000	44,000	36,000
6,100	8,000	91,000	53,000	36,000
6,200	8,000	91,000	53,000	36,000
6,300	8,000	91,000	53,000	36,000
6,350	8,000	91,000	53,000	36,000
6,400	8,000	91,000	53,000	36,000
6,500	8,000	91,000	53,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	91,000	53,000	36,000
6,700	8,000	91,000	53,000	36,000
6,750	8,000	91,000	53,000	36,000
6,800	8,000	91,000	53,000	36,000
6,900	8,000	91,000	53,000	36,000
7,000	8,000	91,000	53,000	36,000
7,100	8,000	91,000	53,000	36,000
7,140	8,000	91,000	53,000	36,000
7,200	8,000	91,000	53,000	36,000
7,300	8,000	91,000	53,000	36,000
7,400	8,000	91,000	53,000	36,000
7,500	8,000	91,000	53,000	36,000
7,540	8,000	91,000	53,000	36,000
7,600	8,000	91,000	53,000	36,000
7,700	8,000	91,000	53,000	36,000
7,800	8,000	91,000	53,000	36,000
7,900	8,000	91,000	53,000	36,000
7,940	8,000	91,000	53,000	36,000
8,000	8,000	91,000	53,000	36,000
8,100	10,000	103,000	61,000	40,000
8,200	10,000	103,000	61,000	40,000
8,300	10,000	103,000	61,000	40,000
8,330	10,000	103,000	61,000	40,000
8,400	10,000	103,000	61,000	40,000
8,500	10,000	103,000	61,000	40,000
8,600	10,000	103,000	61,000	40,000
8,700	10,000	103,000	61,000	40,000
8,730	10,000	103,000	61,000	40,000
8,800	10,000	103,000	61,000	40,000
8,900	10,000	103,000	61,000	40,000
9,000	10,000	103,000	61,000	40,000
9,100	10,000	103,000	61,000	40,000
9,130	10,000	103,000	61,000	40,000
9,200	10,000	103,000	61,000	40,000
9,250	10,000	103,000	61,000	40,000
9,300	10,000	103,000	61,000	40,000
9,400	10,000	103,000	61,000	40,000
9,500	10,000	103,000	61,000	40,000
9,520	10,000	103,000	61,000	40,000
9,600	10,000	103,000	61,000	40,000
9,700	10,000	103,000	61,000	40,000
9,800	10,000	103,000	61,000	40,000
9,900	10,000	103,000	61,000	40,000
9,920	10,000	103,000	61,000	40,000
10,000	10,000	103,000	61,000	40,000
10,100	12,000	118,000	71,000	45,000
10,200	12,000	118,000	71,000	45,000
10,300	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	118,000	71,000	45,000	13,500	14,000	124,000	77,000	45,000
10,400	12,000	118,000	71,000	45,000	13,700	14,000	124,000	77,000	45,000
10,500	12,000	118,000	71,000	45,000	14,000	14,000	124,000	77,000	45,000
10,600	12,000	118,000	71,000	45,000	14,200	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,500	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	18,500	20,000	153,000	101,000	50,000
11,900	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
11,910	12,000	118,000	71,000	45,000	19,500	20,000	153,000	101,000	50,000
12,000	12,000	118,000	71,000	45,000	20,000	20,000	153,000	101,000	50,000
12,200	14,000	124,000	77,000	45,000					
12,500	14,000	124,000	77,000	45,000					
12,700	14,000	124,000	77,000	45,000					
13,000	14,000	124,000	77,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



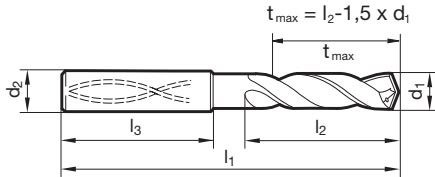
Katalog-Nr. 51786



P	M	K	N	S	H
●	○	○	○	○	○

Arbeitsrichtwerte
Seite 244

- Kegelmantelanschliff
- Hauptschneidenform konkav
- optimierte Schneidengeometrie
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	6,350	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	6,400	8,000	91,000	53,000	36,000
3,170	6,000	66,000	28,000	36,000	6,500	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	6,530	8,000	91,000	53,000	36,000
3,250	6,000	66,000	28,000	36,000	6,550	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	6,600	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	6,700	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	6,750	8,000	91,000	53,000	36,000
3,570	6,000	66,000	28,000	36,000	6,800	8,000	91,000	53,000	36,000
3,600	6,000	66,000	28,000	36,000	6,900	8,000	91,000	53,000	36,000
3,700	6,000	66,000	28,000	36,000	7,000	8,000	91,000	53,000	36,000
3,800	6,000	74,000	36,000	36,000	7,100	8,000	91,000	53,000	36,000
3,900	6,000	74,000	36,000	36,000	7,140	8,000	91,000	53,000	36,000
3,970	6,000	74,000	36,000	36,000	7,200	8,000	91,000	53,000	36,000
4,000	6,000	74,000	36,000	36,000	7,300	8,000	91,000	53,000	36,000
4,040	6,000	74,000	36,000	36,000	7,400	8,000	91,000	53,000	36,000
4,100	6,000	74,000	36,000	36,000	7,500	8,000	91,000	53,000	36,000
4,200	6,000	74,000	36,000	36,000	7,540	8,000	91,000	53,000	36,000
4,300	6,000	74,000	36,000	36,000	7,550	8,000	91,000	53,000	36,000
4,370	6,000	74,000	36,000	36,000	7,600	8,000	91,000	53,000	36,000
4,400	6,000	74,000	36,000	36,000	7,650	8,000	91,000	53,000	36,000
4,500	6,000	74,000	36,000	36,000	7,700	8,000	91,000	53,000	36,000
4,600	6,000	74,000	36,000	36,000	7,800	8,000	91,000	53,000	36,000
4,650	6,000	74,000	36,000	36,000	7,900	8,000	91,000	53,000	36,000
4,700	6,000	74,000	36,000	36,000	7,940	8,000	91,000	53,000	36,000
4,760	6,000	82,000	44,000	36,000	8,000	8,000	91,000	53,000	36,000
4,800	6,000	82,000	44,000	36,000	8,100	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	8,200	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	8,300	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	8,330	10,000	103,000	61,000	40,000
5,110	6,000	82,000	44,000	36,000	8,400	10,000	103,000	61,000	40,000
5,160	6,000	82,000	44,000	36,000	8,500	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	8,600	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	8,700	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	8,730	10,000	103,000	61,000	40,000
5,410	6,000	82,000	44,000	36,000	8,800	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	8,900	10,000	103,000	61,000	40,000
5,550	6,000	82,000	44,000	36,000	9,000	10,000	103,000	61,000	40,000
5,560	6,000	82,000	44,000	36,000	9,100	10,000	103,000	61,000	40,000
5,600	6,000	82,000	44,000	36,000	9,130	10,000	103,000	61,000	40,000
5,700	6,000	82,000	44,000	36,000	9,200	10,000	103,000	61,000	40,000
5,800	6,000	82,000	44,000	36,000	9,250	10,000	103,000	61,000	40,000
5,900	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
5,950	6,000	82,000	44,000	36,000	9,340	10,000	103,000	61,000	40,000
6,000	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
6,100	8,000	91,000	53,000	36,000	9,500	10,000	103,000	61,000	40,000
6,200	8,000	91,000	53,000	36,000	9,520	10,000	103,000	61,000	40,000
6,300	8,000	91,000	53,000	36,000	9,550	10,000	103,000	61,000	40,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



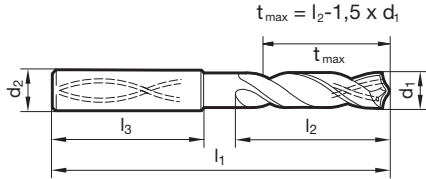
Katalog-Nr. 51754



P	M	K	N	S	H
●				●	○

Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \text{Ø } 3,000$
- Kegelmantelanschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	6,600	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	6,700	8,000	91,000	53,000	36,000
3,170	6,000	66,000	28,000	36,000	6,750	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	6,800	8,000	91,000	53,000	36,000
3,250	6,000	66,000	28,000	36,000	6,900	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	7,000	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	7,100	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	7,140	8,000	91,000	53,000	36,000
3,570	6,000	66,000	28,000	36,000	7,200	8,000	91,000	53,000	36,000
3,600	6,000	66,000	28,000	36,000	7,300	8,000	91,000	53,000	36,000
3,700	6,000	66,000	28,000	36,000	7,400	8,000	91,000	53,000	36,000
3,800	6,000	74,000	36,000	36,000	7,500	8,000	91,000	53,000	36,000
3,900	6,000	74,000	36,000	36,000	7,540	8,000	91,000	53,000	36,000
3,970	6,000	74,000	36,000	36,000	7,600	8,000	91,000	53,000	36,000
4,000	6,000	74,000	36,000	36,000	7,700	8,000	91,000	53,000	36,000
4,100	6,000	74,000	36,000	36,000	7,800	8,000	91,000	53,000	36,000
4,200	6,000	74,000	36,000	36,000	7,900	8,000	91,000	53,000	36,000
4,300	6,000	74,000	36,000	36,000	7,940	8,000	91,000	53,000	36,000
4,370	6,000	74,000	36,000	36,000	8,000	8,000	91,000	53,000	36,000
4,400	6,000	74,000	36,000	36,000	8,100	10,000	103,000	61,000	40,000
4,500	6,000	74,000	36,000	36,000	8,200	10,000	103,000	61,000	40,000
4,600	6,000	74,000	36,000	36,000	8,300	10,000	103,000	61,000	40,000
4,650	6,000	74,000	36,000	36,000	8,330	10,000	103,000	61,000	40,000
4,700	6,000	74,000	36,000	36,000	8,400	10,000	103,000	61,000	40,000
4,760	6,000	82,000	44,000	36,000	8,500	10,000	103,000	61,000	40,000
4,800	6,000	82,000	44,000	36,000	8,600	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	8,700	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	8,730	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	8,800	10,000	103,000	61,000	40,000
5,160	6,000	82,000	44,000	36,000	8,900	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	9,000	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	9,100	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	9,130	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	9,200	10,000	103,000	61,000	40,000
5,550	6,000	82,000	44,000	36,000	9,250	10,000	103,000	61,000	40,000
5,560	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
5,600	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
5,700	6,000	82,000	44,000	36,000	9,500	10,000	103,000	61,000	40,000
5,800	6,000	82,000	44,000	36,000	9,520	10,000	103,000	61,000	40,000
5,900	6,000	82,000	44,000	36,000	9,600	10,000	103,000	61,000	40,000
5,950	6,000	82,000	44,000	36,000	9,700	10,000	103,000	61,000	40,000
6,000	6,000	82,000	44,000	36,000	9,800	10,000	103,000	61,000	40,000
6,100	8,000	91,000	53,000	36,000	9,900	10,000	103,000	61,000	40,000
6,200	8,000	91,000	53,000	36,000	9,920	10,000	103,000	61,000	40,000
6,300	8,000	91,000	53,000	36,000	10,000	10,000	103,000	61,000	40,000
6,350	8,000	91,000	53,000	36,000	10,100	12,000	118,000	71,000	45,000
6,400	8,000	91,000	53,000	36,000	10,200	12,000	118,000	71,000	45,000
6,500	8,000	91,000	53,000	36,000	10,300	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	118,000	71,000	45,000	13,500	14,000	124,000	77,000	45,000
10,400	12,000	118,000	71,000	45,000	13,700	14,000	124,000	77,000	45,000
10,500	12,000	118,000	71,000	45,000	14,000	14,000	124,000	77,000	45,000
10,600	12,000	118,000	71,000	45,000	14,200	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,720	12,000	118,000	71,000	45,000	14,300	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	15,300	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	15,870	16,000	133,000	83,000	48,000
11,500	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,510	12,000	118,000	71,000	45,000	16,300	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	16,900	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,900	12,000	118,000	71,000	45,000	17,300	18,000	143,000	93,000	48,000
11,910	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
12,000	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
12,200	14,000	124,000	77,000	45,000	18,500	20,000	153,000	101,000	50,000
12,300	14,000	124,000	77,000	45,000	18,900	20,000	153,000	101,000	50,000
12,500	14,000	124,000	77,000	45,000	19,000	20,000	153,000	101,000	50,000
12,700	14,000	124,000	77,000	45,000	19,050	20,000	153,000	101,000	50,000
12,800	14,000	124,000	77,000	45,000	19,300	20,000	153,000	101,000	50,000
13,000	14,000	124,000	77,000	45,000	19,500	20,000	153,000	101,000	50,000
13,300	14,000	124,000	77,000	45,000	20,000	20,000	153,000	101,000	50,000
13,490	14,000	124,000	77,000	45,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



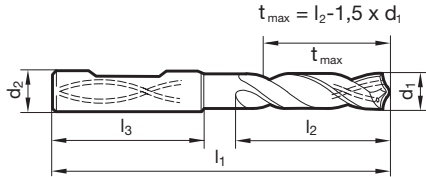
Katalog-Nr. 51755



P	M	K	N	S	H
●				●	○

Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelanschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	6,600	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	6,700	8,000	91,000	53,000	36,000
3,170	6,000	66,000	28,000	36,000	6,750	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	6,800	8,000	91,000	53,000	36,000
3,250	6,000	66,000	28,000	36,000	6,900	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	7,000	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	7,100	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	7,140	8,000	91,000	53,000	36,000
3,570	6,000	66,000	28,000	36,000	7,200	8,000	91,000	53,000	36,000
3,600	6,000	66,000	28,000	36,000	7,300	8,000	91,000	53,000	36,000
3,700	6,000	66,000	28,000	36,000	7,400	8,000	91,000	53,000	36,000
3,800	6,000	74,000	36,000	36,000	7,500	8,000	91,000	53,000	36,000
3,900	6,000	74,000	36,000	36,000	7,540	8,000	91,000	53,000	36,000
3,970	6,000	74,000	36,000	36,000	7,600	8,000	91,000	53,000	36,000
4,000	6,000	74,000	36,000	36,000	7,700	8,000	91,000	53,000	36,000
4,100	6,000	74,000	36,000	36,000	7,800	8,000	91,000	53,000	36,000
4,200	6,000	74,000	36,000	36,000	7,900	8,000	91,000	53,000	36,000
4,300	6,000	74,000	36,000	36,000	7,940	8,000	91,000	53,000	36,000
4,370	6,000	74,000	36,000	36,000	8,000	8,000	91,000	53,000	36,000
4,400	6,000	74,000	36,000	36,000	8,100	10,000	103,000	61,000	40,000
4,500	6,000	74,000	36,000	36,000	8,200	10,000	103,000	61,000	40,000
4,600	6,000	74,000	36,000	36,000	8,300	10,000	103,000	61,000	40,000
4,650	6,000	74,000	36,000	36,000	8,330	10,000	103,000	61,000	40,000
4,700	6,000	74,000	36,000	36,000	8,400	10,000	103,000	61,000	40,000
4,760	6,000	82,000	44,000	36,000	8,500	10,000	103,000	61,000	40,000
4,800	6,000	82,000	44,000	36,000	8,600	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	8,700	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	8,730	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	8,800	10,000	103,000	61,000	40,000
5,160	6,000	82,000	44,000	36,000	8,900	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	9,000	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	9,100	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	9,130	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	9,200	10,000	103,000	61,000	40,000
5,550	6,000	82,000	44,000	36,000	9,250	10,000	103,000	61,000	40,000
5,560	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
5,600	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
5,700	6,000	82,000	44,000	36,000	9,500	10,000	103,000	61,000	40,000
5,800	6,000	82,000	44,000	36,000	9,520	10,000	103,000	61,000	40,000
5,900	6,000	82,000	44,000	36,000	9,600	10,000	103,000	61,000	40,000
5,950	6,000	82,000	44,000	36,000	9,700	10,000	103,000	61,000	40,000
6,000	6,000	82,000	44,000	36,000	9,800	10,000	103,000	61,000	40,000
6,100	8,000	91,000	53,000	36,000	9,900	10,000	103,000	61,000	40,000
6,200	8,000	91,000	53,000	36,000	9,920	10,000	103,000	61,000	40,000
6,300	8,000	91,000	53,000	36,000	10,000	10,000	103,000	61,000	40,000
6,350	8,000	91,000	53,000	36,000	10,100	12,000	118,000	71,000	45,000
6,400	8,000	91,000	53,000	36,000	10,200	12,000	118,000	71,000	45,000
6,500	8,000	91,000	53,000	36,000	10,300	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,320	12,000	118,000	71,000	45,000	14,290	16,000	133,000	83,000	48,000
10,400	12,000	118,000	71,000	45,000	14,300	16,000	133,000	83,000	48,000
10,500	12,000	118,000	71,000	45,000	14,500	16,000	133,000	83,000	48,000
10,600	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
10,700	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
10,800	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	15,300	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,110	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	16,300	18,000	143,000	93,000	48,000
11,300	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,400	12,000	118,000	71,000	45,000	16,900	18,000	143,000	93,000	48,000
11,500	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	17,300	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
11,900	12,000	118,000	71,000	45,000	18,500	20,000	153,000	101,000	50,000
11,910	12,000	118,000	71,000	45,000	18,900	20,000	153,000	101,000	50,000
12,000	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
12,200	14,000	124,000	77,000	45,000	19,050	20,000	153,000	101,000	50,000
12,500	14,000	124,000	77,000	45,000	19,300	20,000	153,000	101,000	50,000
12,700	14,000	124,000	77,000	45,000	19,500	20,000	153,000	101,000	50,000
12,800	14,000	124,000	77,000	45,000	20,000	20,000	153,000	101,000	50,000
13,000	14,000	124,000	77,000	45,000					
13,300	14,000	124,000	77,000	45,000					
13,500	14,000	124,000	77,000	45,000					
13,700	14,000	124,000	77,000	45,000					
14,000	14,000	124,000	77,000	45,000					
14,200	16,000	133,000	83,000	48,000					

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



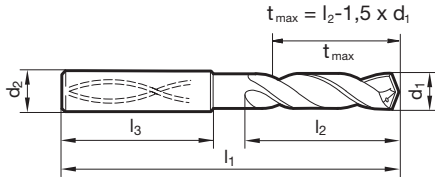
Katalog-Nr. 51791



P	M	K	N	S	H
●	○	○	○	○	○

Arbeitsrichtwerte
Seite 244

- Kegelmantelschliff
- Hauptschneidenform konkav
- optimierte Schneidengeometrie
- vier Führungsfasen



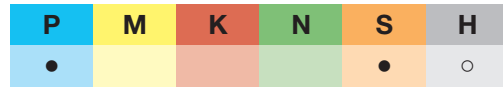
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	70,000	30,000	36,000	6,350	8,000	106,000	66,000	36,000
3,100	6,000	70,000	30,000	36,000	6,400	8,000	106,000	66,000	36,000
3,170	6,000	70,000	30,000	36,000	6,500	8,000	106,000	66,000	36,000
3,200	6,000	70,000	30,000	36,000	6,530	8,000	106,000	66,000	36,000
3,250	6,000	70,000	30,000	36,000	6,550	8,000	106,000	66,000	36,000
3,300	6,000	70,000	30,000	36,000	6,600	8,000	106,000	66,000	36,000
3,400	6,000	75,000	35,500	36,000	6,700	8,000	106,000	66,000	36,000
3,500	6,000	75,000	35,500	36,000	6,750	8,000	106,000	66,000	36,000
3,570	6,000	75,000	35,500	36,000	6,800	8,000	106,000	66,000	36,000
3,600	6,000	75,000	35,500	36,000	6,900	8,000	116,000	76,000	36,000
3,700	6,000	75,000	35,500	36,000	7,000	8,000	116,000	76,000	36,000
3,800	6,000	75,000	37,500	36,000	7,100	8,000	116,000	76,000	36,000
3,900	6,000	75,000	37,500	36,000	7,140	8,000	116,000	76,000	36,000
3,970	6,000	75,000	37,500	36,000	7,200	8,000	116,000	76,000	36,000
4,000	6,000	75,000	37,500	36,000	7,300	8,000	116,000	76,000	36,000
4,040	6,000	75,000	37,500	36,000	7,400	8,000	116,000	76,000	36,000
4,100	6,000	75,000	37,500	36,000	7,500	8,000	116,000	76,000	36,000
4,200	6,000	75,000	37,500	36,000	7,540	8,000	116,000	76,000	36,000
4,300	6,000	85,000	45,000	36,000	7,550	8,000	116,000	76,000	36,000
4,370	6,000	85,000	45,000	36,000	7,600	8,000	116,000	76,000	36,000
4,400	6,000	85,000	45,000	36,000	7,650	8,000	116,000	76,000	36,000
4,500	6,000	85,000	45,000	36,000	7,700	8,000	116,000	76,000	36,000
4,600	6,000	85,000	45,000	36,000	7,800	8,000	116,000	76,000	36,000
4,650	6,000	85,000	45,000	36,000	7,900	8,000	116,000	76,000	36,000
4,700	6,000	85,000	45,000	36,000	7,940	8,000	116,000	76,000	36,000
4,760	6,000	90,000	50,000	36,000	8,000	8,000	116,000	76,000	36,000
4,800	6,000	90,000	50,000	36,000	8,100	10,000	131,000	87,000	40,000
4,900	6,000	90,000	50,000	36,000	8,200	10,000	131,000	87,000	40,000
5,000	6,000	90,000	50,000	36,000	8,300	10,000	131,000	87,000	40,000
5,100	6,000	90,000	50,000	36,000	8,330	10,000	131,000	87,000	40,000
5,110	6,000	90,000	50,000	36,000	8,400	10,000	131,000	87,000	40,000
5,160	6,000	90,000	50,000	36,000	8,500	10,000	131,000	87,000	40,000
5,200	6,000	90,000	50,000	36,000	8,600	10,000	131,000	87,000	40,000
5,300	6,000	90,000	50,000	36,000	8,700	10,000	131,000	87,000	40,000
5,400	6,000	97,000	57,000	36,000	8,730	10,000	131,000	87,000	40,000
5,410	6,000	97,000	57,000	36,000	8,800	10,000	131,000	87,000	40,000
5,500	6,000	97,000	57,000	36,000	8,900	10,000	131,000	87,000	40,000
5,550	6,000	97,000	57,000	36,000	9,000	10,000	131,000	87,000	40,000
5,560	6,000	97,000	57,000	36,000	9,100	10,000	139,000	95,000	40,000
5,600	6,000	97,000	57,000	36,000	9,130	10,000	139,000	95,000	40,000
5,700	6,000	97,000	57,000	36,000	9,200	10,000	139,000	95,000	40,000
5,800	6,000	97,000	57,000	36,000	9,250	10,000	139,000	95,000	40,000
5,900	6,000	97,000	57,000	36,000	9,300	10,000	139,000	95,000	40,000
5,950	6,000	97,000	57,000	36,000	9,340	10,000	139,000	95,000	40,000
6,000	6,000	97,000	57,000	36,000	9,400	10,000	139,000	95,000	40,000
6,100	8,000	106,000	66,000	36,000	9,500	10,000	139,000	95,000	40,000
6,200	8,000	106,000	66,000	36,000	9,520	10,000	139,000	95,000	40,000
6,300	8,000	106,000	66,000	36,000	9,550	10,000	139,000	95,000	40,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung

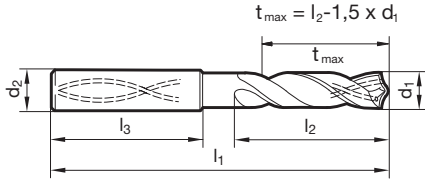


Katalog-Nr. 51756



Arbeitsrichtwerte
Seite 242

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelschliff
- Hauptschneidenform konkav
- sehr harte Beschichtung
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	70,000	30,000	36,000
3,170	6,000	70,000	30,000	36,000
3,250	6,000	70,000	30,000	36,000
3,300	6,000	70,000	30,000	36,000
3,400	6,000	75,000	35,500	36,000
3,500	6,000	75,000	35,500	36,000
3,570	6,000	75,000	35,500	36,000
3,700	6,000	75,000	35,500	36,000
3,970	6,000	75,000	37,500	36,000
4,000	6,000	75,000	37,500	36,000
4,200	6,000	75,000	37,500	36,000
4,300	6,000	85,000	45,000	36,000
4,370	6,000	85,000	45,000	36,000
4,500	6,000	85,000	45,000	36,000
4,650	6,000	85,000	45,000	36,000
4,760	6,000	90,000	50,000	36,000
5,000	6,000	90,000	50,000	36,000
5,100	6,000	90,000	50,000	36,000
5,160	6,000	90,000	50,000	36,000
5,200	6,000	90,000	50,000	36,000
5,500	6,000	97,000	57,000	36,000
5,550	6,000	97,000	57,000	36,000
5,560	6,000	97,000	57,000	36,000
5,950	6,000	97,000	57,000	36,000
6,000	6,000	97,000	57,000	36,000
6,350	8,000	106,000	66,000	36,000
6,500	8,000	106,000	66,000	36,000
6,530	8,000	106,000	66,000	36,000
6,750	8,000	106,000	66,000	36,000
6,800	8,000	106,000	66,000	36,000
6,900	8,000	116,000	76,000	36,000
7,000	8,000	116,000	76,000	36,000
7,140	8,000	116,000	76,000	36,000
7,400	8,000	116,000	76,000	36,000
7,500	8,000	116,000	76,000	36,000
7,540	8,000	116,000	76,000	36,000
7,800	8,000	116,000	76,000	36,000
7,940	8,000	116,000	76,000	36,000
8,000	8,000	116,000	76,000	36,000
8,330	10,000	131,000	87,000	40,000
8,500	10,000	131,000	87,000	40,000
8,600	10,000	131,000	87,000	40,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,730	10,000	131,000	87,000	40,000
8,800	10,000	131,000	87,000	40,000
9,000	10,000	131,000	87,000	40,000
9,130	10,000	139,000	95,000	40,000
9,250	10,000	139,000	95,000	40,000
9,340	10,000	139,000	95,000	40,000
9,400	10,000	139,000	95,000	40,000
9,500	10,000	139,000	95,000	40,000
9,520	10,000	139,000	95,000	40,000
9,920	10,000	139,000	95,000	40,000
10,000	10,000	139,000	95,000	40,000
10,200	12,000	155,000	106,000	45,000
10,320	12,000	155,000	106,000	45,000
10,400	12,000	155,000	106,000	45,000
10,500	12,000	155,000	106,000	45,000
10,720	12,000	155,000	106,000	45,000
10,800	12,000	155,000	106,000	45,000
11,000	12,000	155,000	106,000	45,000
11,110	12,000	163,000	114,000	45,000
11,300	12,000	163,000	114,000	45,000
11,400	12,000	163,000	114,000	45,000
11,500	12,000	163,000	114,000	45,000
11,510	12,000	163,000	114,000	45,000
11,910	12,000	163,000	114,000	45,000
12,000	12,000	163,000	114,000	45,000
12,300	14,000	182,000	133,000	45,000
12,500	14,000	182,000	133,000	45,000
12,700	14,000	182,000	133,000	45,000
13,000	14,000	182,000	133,000	45,000
13,100	14,000	182,000	133,000	45,000
13,490	14,000	182,000	133,000	45,000
13,500	14,000	182,000	133,000	45,000
14,000	14,000	182,000	133,000	45,000
14,500	16,000	204,000	152,000	48,000
15,000	16,000	204,000	152,000	48,000
15,100	16,000	204,000	152,000	48,000
15,500	16,000	204,000	152,000	48,000
15,870	16,000	204,000	152,000	48,000
16,000	16,000	204,000	152,000	48,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



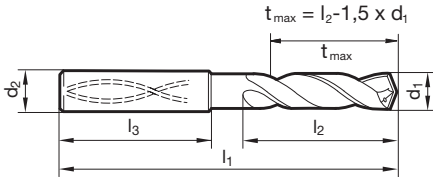
Katalog-Nr. 51792



P	M	K	N	S	H
●	○	○	○	○	○

 Arbeitsrichtwerte
Seite 244

- Kegelmantelschliff
- Hauptschneidenform konkav
- optimierte Schneidengeometrie
- vier Führungsfasen



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	95,000	55,000	36,000
3,100	6,000	95,000	55,000	36,000
3,170	6,000	95,000	55,000	36,000
3,200	6,000	95,000	55,000	36,000
3,250	6,000	95,000	55,000	36,000
3,300	6,000	95,000	55,000	36,000
3,400	6,000	95,000	55,000	36,000
3,500	6,000	102,000	62,000	36,000
3,570	6,000	102,000	62,000	36,000
3,600	6,000	102,000	62,000	36,000
3,700	6,000	102,000	62,000	36,000
3,800	6,000	102,000	62,000	36,000
3,900	6,000	102,000	62,000	36,000
3,970	6,000	102,000	62,000	36,000
4,000	6,000	102,000	62,000	36,000
4,040	6,000	109,000	69,000	36,000
4,100	6,000	109,000	69,000	36,000
4,200	6,000	109,000	69,000	36,000
4,300	6,000	109,000	69,000	36,000
4,370	6,000	109,000	69,000	36,000
4,400	6,000	109,000	69,000	36,000
4,500	6,000	116,000	76,000	36,000
4,600	6,000	116,000	76,000	36,000
4,650	6,000	116,000	76,000	36,000
4,700	6,000	116,000	76,000	36,000
4,760	6,000	116,000	76,000	36,000
4,800	6,000	116,000	76,000	36,000
4,900	6,000	116,000	76,000	36,000
5,000	6,000	116,000	76,000	36,000
5,100	6,000	123,000	83,000	36,000
5,110	6,000	123,000	83,000	36,000
5,160	6,000	123,000	83,000	36,000
5,200	6,000	123,000	83,000	36,000
5,300	6,000	123,000	83,000	36,000
5,400	6,000	123,000	83,000	36,000
5,410	6,000	123,000	83,000	36,000
5,500	6,000	130,000	90,000	36,000
5,550	6,000	130,000	90,000	36,000
5,560	6,000	130,000	90,000	36,000
5,600	6,000	130,000	90,000	36,000
5,700	6,000	130,000	90,000	36,000
5,800	6,000	130,000	90,000	36,000
5,900	6,000	130,000	90,000	36,000
5,950	6,000	130,000	90,000	36,000
6,000	6,000	130,000	90,000	36,000
6,100	8,000	158,000	118,000	36,000
6,200	8,000	158,000	118,000	36,000
6,300	8,000	158,000	118,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,350	8,000	158,000	118,000	36,000
6,400	8,000	158,000	118,000	36,000
6,500	8,000	158,000	118,000	36,000
6,530	8,000	158,000	118,000	36,000
6,550	8,000	158,000	118,000	36,000
6,600	8,000	158,000	118,000	36,000
6,700	8,000	158,000	118,000	36,000
6,750	8,000	158,000	118,000	36,000
6,800	8,000	158,000	118,000	36,000
6,900	8,000	158,000	118,000	36,000
7,000	8,000	158,000	118,000	36,000
7,100	8,000	158,000	118,000	36,000
7,140	8,000	158,000	118,000	36,000
7,200	8,000	158,000	118,000	36,000
7,300	8,000	158,000	118,000	36,000
7,400	8,000	158,000	118,000	36,000
7,500	8,000	158,000	118,000	36,000
7,540	8,000	158,000	118,000	36,000
7,550	8,000	158,000	118,000	36,000
7,600	8,000	158,000	118,000	36,000
7,650	8,000	158,000	118,000	36,000
7,700	8,000	158,000	118,000	36,000
7,800	8,000	158,000	118,000	36,000
7,900	8,000	158,000	118,000	36,000
7,940	8,000	158,000	118,000	36,000
8,000	8,000	158,000	118,000	36,000
8,100	10,000	190,000	146,000	40,000
8,200	10,000	190,000	146,000	40,000
8,300	10,000	190,000	146,000	40,000
8,330	10,000	190,000	146,000	40,000
8,400	10,000	190,000	146,000	40,000
8,500	10,000	190,000	146,000	40,000
8,600	10,000	190,000	146,000	40,000
8,700	10,000	190,000	146,000	40,000
8,730	10,000	190,000	146,000	40,000
8,800	10,000	190,000	146,000	40,000
8,900	10,000	190,000	146,000	40,000
9,000	10,000	190,000	146,000	40,000
9,100	10,000	190,000	146,000	40,000
9,130	10,000	190,000	146,000	40,000
9,200	10,000	190,000	146,000	40,000
9,250	10,000	190,000	146,000	40,000
9,300	10,000	190,000	146,000	40,000
9,340	10,000	190,000	146,000	40,000
9,400	10,000	190,000	146,000	40,000
9,500	10,000	190,000	146,000	40,000
9,520	10,000	190,000	146,000	40,000
9,550	10,000	190,000	146,000	40,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



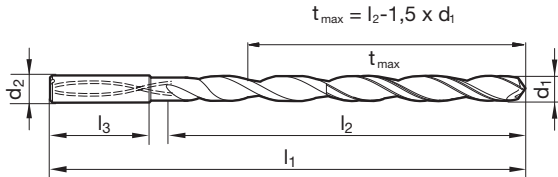
Katalog-Nr. 51764



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 246

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelschliff
- Kopfbeschichtung
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- Einsatz im Hydraulik-Dehnspannfutter
- vier Führungsfasen
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	95,000	55,000	36,000
3,100	6,000	106,000	66,000	36,000
3,170	6,000	106,000	66,000	36,000
3,200	6,000	106,000	66,000	36,000
3,300	6,000	106,000	66,000	36,000
3,500	6,000	116,000	76,000	36,000
3,570	6,000	116,000	76,000	36,000
3,700	6,000	116,000	76,000	36,000
3,800	6,000	116,000	76,000	36,000
3,970	6,000	116,000	76,000	36,000
4,000	6,000	116,000	76,000	36,000
4,100	6,000	133,000	93,000	36,000
4,200	6,000	133,000	93,000	36,000
4,300	6,000	133,000	93,000	36,000
4,370	6,000	133,000	93,000	36,000
4,500	6,000	133,000	93,000	36,000
4,600	6,000	133,000	93,000	36,000
4,760	6,000	133,000	93,000	36,000
4,800	6,000	133,000	93,000	36,000
5,000	6,000	133,000	93,000	36,000
5,100	6,000	150,000	110,000	36,000
5,160	6,000	150,000	110,000	36,000
5,410	6,000	150,000	110,000	36,000
5,500	6,000	150,000	110,000	36,000
5,560	6,000	150,000	110,000	36,000
5,600	6,000	150,000	110,000	36,000
5,800	6,000	150,000	110,000	36,000
5,950	6,000	150,000	110,000	36,000
6,000	6,000	150,000	110,000	36,000
6,300	8,000	167,000	127,000	36,000
6,350	8,000	167,000	127,000	36,000
6,500	8,000	167,000	127,000	36,000
6,750	8,000	167,000	127,000	36,000
6,800	8,000	167,000	127,000	36,000
7,000	8,000	167,000	127,000	36,000
7,140	8,000	183,000	143,000	36,000
7,500	8,000	183,000	143,000	36,000
7,540	8,000	183,000	143,000	36,000
7,800	8,000	183,000	143,000	36,000
7,940	8,000	183,000	143,000	36,000
8,000	8,000	183,000	143,000	36,000
8,330	10,000	204,000	160,000	40,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,500	10,000	204,000	160,000	40,000
8,730	10,000	204,000	160,000	40,000
8,800	10,000	204,000	160,000	40,000
9,000	10,000	204,000	160,000	40,000
9,130	10,000	221,000	177,000	40,000
9,500	10,000	221,000	177,000	40,000
9,520	10,000	221,000	177,000	40,000
9,800	10,000	221,000	177,000	40,000
9,920	10,000	221,000	177,000	40,000
10,000	10,000	221,000	177,000	40,000
10,200	12,000	247,000	198,000	45,000
10,320	12,000	247,000	198,000	45,000
10,500	12,000	247,000	198,000	45,000
10,720	12,000	247,000	198,000	45,000
11,000	12,000	247,000	198,000	45,000
11,110	12,000	263,000	214,000	45,000
11,510	12,000	263,000	214,000	45,000
11,800	12,000	263,000	214,000	45,000
11,910	12,000	263,000	214,000	45,000
12,000	12,000	263,000	214,000	45,000
12,300	14,000	297,000	248,000	45,000
12,500	14,000	297,000	248,000	45,000
12,700	14,000	297,000	248,000	45,000
13,000	14,000	297,000	248,000	45,000
13,100	14,000	297,000	248,000	45,000
13,490	14,000	297,000	248,000	45,000
13,890	14,000	297,000	248,000	45,000
14,000	14,000	297,000	248,000	45,000
14,290	16,000	333,000	281,000	48,000
15,000	16,000	333,000	281,000	48,000
15,870	16,000	333,000	281,000	48,000
16,000	16,000	333,000	281,000	48,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



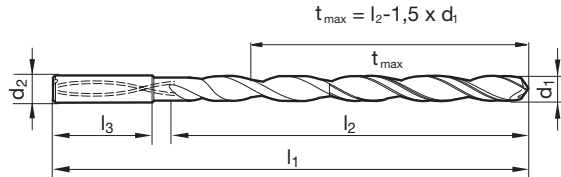
Katalog-Nr. 71764



P	M	K	N	S	H
			•		

Arbeitsrichtwerte
Seite 248

- Flächenanschliff
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- Kühlmitteldruck beachten
- zum Pilotieren empfehlen wir den SuperV-AL/Artikel-Nr. 71791 oder SuperV-180/ Artikel-Nr. 51718



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	95,000	55,000	36,000
3,100	6,000	106,000	66,000	36,000
3,170	6,000	106,000	66,000	36,000
3,200	6,000	106,000	66,000	36,000
3,250	6,000	106,000	66,000	36,000
3,300	6,000	106,000	66,000	36,000
3,400	6,000	106,000	66,000	36,000
3,500	6,000	116,000	76,000	36,000
3,570	6,000	116,000	76,000	36,000
3,600	6,000	116,000	76,000	36,000
3,700	6,000	116,000	76,000	36,000
3,800	6,000	116,000	76,000	36,000
3,900	6,000	116,000	76,000	36,000
3,970	6,000	116,000	76,000	36,000
4,000	6,000	116,000	76,000	36,000
4,100	6,000	133,000	93,000	36,000
4,200	6,000	133,000	93,000	36,000
4,300	6,000	133,000	93,000	36,000
4,370	6,000	133,000	93,000	36,000
4,400	6,000	133,000	93,000	36,000
4,500	6,000	133,000	93,000	36,000
4,600	6,000	133,000	93,000	36,000
4,650	6,000	133,000	93,000	36,000
4,700	6,000	133,000	93,000	36,000
4,760	6,000	133,000	93,000	36,000
4,800	6,000	133,000	93,000	36,000
4,900	6,000	133,000	93,000	36,000
5,000	6,000	133,000	93,000	36,000
5,100	6,000	150,000	110,000	36,000
5,160	6,000	150,000	110,000	36,000
5,200	6,000	150,000	110,000	36,000
5,300	6,000	150,000	110,000	36,000
5,400	6,000	150,000	110,000	36,000
5,500	6,000	150,000	110,000	36,000
5,550	6,000	150,000	110,000	36,000
5,560	6,000	150,000	110,000	36,000
5,600	6,000	150,000	110,000	36,000
5,700	6,000	150,000	110,000	36,000
5,800	6,000	150,000	110,000	36,000
5,900	6,000	150,000	110,000	36,000
5,950	6,000	150,000	110,000	36,000
6,000	6,000	150,000	110,000	36,000
6,100	8,000	167,000	127,000	36,000
6,200	8,000	167,000	127,000	36,000
6,300	8,000	167,000	127,000	36,000
6,350	8,000	167,000	127,000	36,000
6,400	8,000	167,000	127,000	36,000
6,500	8,000	167,000	127,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	167,000	127,000	36,000
6,700	8,000	167,000	127,000	36,000
6,750	8,000	167,000	127,000	36,000
6,800	8,000	167,000	127,000	36,000
6,900	8,000	167,000	127,000	36,000
7,000	8,000	167,000	127,000	36,000
7,100	8,000	183,000	143,000	36,000
7,140	8,000	183,000	143,000	36,000
7,200	8,000	183,000	143,000	36,000
7,300	8,000	183,000	143,000	36,000
7,400	8,000	183,000	143,000	36,000
7,500	8,000	183,000	143,000	36,000
7,540	8,000	183,000	143,000	36,000
7,600	8,000	183,000	143,000	36,000
7,700	8,000	183,000	143,000	36,000
7,800	8,000	183,000	143,000	36,000
7,900	8,000	183,000	143,000	36,000
7,940	8,000	183,000	143,000	36,000
8,000	8,000	183,000	143,000	36,000
8,100	10,000	204,000	160,000	40,000
8,200	10,000	204,000	160,000	40,000
8,300	10,000	204,000	160,000	40,000
8,330	10,000	204,000	160,000	40,000
8,400	10,000	204,000	160,000	40,000
8,500	10,000	204,000	160,000	40,000
8,600	10,000	204,000	160,000	40,000
8,700	10,000	204,000	160,000	40,000
8,730	10,000	204,000	160,000	40,000
8,800	10,000	204,000	160,000	40,000
8,900	10,000	204,000	160,000	40,000
9,000	10,000	204,000	160,000	40,000
9,100	10,000	221,000	177,000	40,000
9,130	10,000	221,000	177,000	40,000
9,200	10,000	221,000	177,000	40,000
9,250	10,000	221,000	177,000	40,000
9,300	10,000	221,000	177,000	40,000
9,340	10,000	221,000	177,000	40,000
9,400	10,000	221,000	177,000	40,000
9,500	10,000	221,000	177,000	40,000
9,520	10,000	221,000	177,000	40,000
9,600	10,000	221,000	177,000	40,000
9,700	10,000	221,000	177,000	40,000
9,800	10,000	221,000	177,000	40,000
9,900	10,000	221,000	177,000	40,000
9,920	10,000	221,000	177,000	40,000
10,000	10,000	221,000	177,000	40,000
10,100	12,000	247,000	198,000	45,000
10,200	12,000	247,000	198,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,300	12,000	247,000	198,000	45,000	11,900	12,000	263,000	214,000	45,000
10,320	12,000	247,000	198,000	45,000	11,910	12,000	263,000	214,000	45,000
10,400	12,000	247,000	198,000	45,000	12,000	12,000	263,000	214,000	45,000
10,500	12,000	247,000	198,000	45,000	12,100	14,000	297,000	248,000	45,000
10,600	12,000	247,000	198,000	45,000	12,200	14,000	297,000	248,000	45,000
10,700	12,000	247,000	198,000	45,000	12,500	14,000	297,000	248,000	45,000
10,800	12,000	247,000	198,000	45,000	12,600	14,000	297,000	248,000	45,000
10,900	12,000	247,000	198,000	45,000	12,700	14,000	297,000	248,000	45,000
11,000	12,000	247,000	198,000	45,000	12,800	14,000	297,000	248,000	45,000
11,100	12,000	263,000	214,000	45,000	12,900	14,000	297,000	248,000	45,000
11,110	12,000	263,000	214,000	45,000	13,000	14,000	297,000	248,000	45,000
11,200	12,000	263,000	214,000	45,000	13,100	14,000	297,000	248,000	45,000
11,300	12,000	263,000	214,000	45,000	13,300	14,000	297,000	248,000	45,000
11,400	12,000	263,000	214,000	45,000	13,400	14,000	297,000	248,000	45,000
11,500	12,000	263,000	214,000	45,000	13,500	14,000	297,000	248,000	45,000
11,600	12,000	263,000	214,000	45,000	13,700	14,000	297,000	248,000	45,000
11,700	12,000	263,000	214,000	45,000	13,800	14,000	297,000	248,000	45,000
11,800	12,000	263,000	214,000	45,000	14,000	14,000	297,000	248,000	45,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



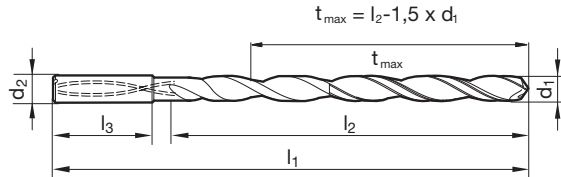
Katalog-Nr. 51765



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 246

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelanschliff
- Kopfbeschichtung
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- vier Führungsfasen
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	110,000	70,000	36,000
3,100	6,000	123,000	83,000	36,000
3,170	6,000	123,000	83,000	36,000
3,200	6,000	123,000	83,000	36,000
3,300	6,000	123,000	83,000	36,000
3,500	6,000	136,000	96,000	36,000
3,570	6,000	136,000	96,000	36,000
3,700	6,000	136,000	96,000	36,000
3,800	6,000	136,000	96,000	36,000
3,970	6,000	136,000	96,000	36,000
4,000	6,000	136,000	96,000	36,000
4,200	6,000	158,000	118,000	36,000
4,300	6,000	158,000	118,000	36,000
4,370	6,000	158,000	118,000	36,000
4,500	6,000	158,000	118,000	36,000
4,600	6,000	158,000	118,000	36,000
4,760	6,000	158,000	118,000	36,000
4,800	6,000	158,000	118,000	36,000
5,000	6,000	158,000	118,000	36,000
5,100	6,000	180,000	140,000	36,000
5,160	6,000	180,000	140,000	36,000
5,410	6,000	180,000	140,000	36,000
5,500	6,000	180,000	140,000	36,000
5,560	6,000	180,000	140,000	36,000
5,800	6,000	180,000	140,000	36,000
5,950	6,000	180,000	140,000	36,000
6,000	6,000	180,000	140,000	36,000
6,300	8,000	202,000	162,000	36,000
6,350	8,000	202,000	162,000	36,000
6,500	8,000	202,000	162,000	36,000
6,750	8,000	202,000	162,000	36,000
6,800	8,000	202,000	162,000	36,000
7,000	8,000	202,000	162,000	36,000
7,140	8,000	223,000	183,000	36,000
7,500	8,000	223,000	183,000	36,000
7,540	8,000	223,000	183,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
7,800	8,000	223,000	183,000	36,000
7,940	8,000	223,000	183,000	36,000
8,000	8,000	223,000	183,000	36,000
8,330	10,000	249,000	205,000	40,000
8,500	10,000	249,000	205,000	40,000
8,730	10,000	249,000	205,000	40,000
8,800	10,000	249,000	205,000	40,000
9,000	10,000	249,000	205,000	40,000
9,130	10,000	271,000	227,000	40,000
9,520	10,000	271,000	227,000	40,000
9,920	10,000	271,000	227,000	40,000
10,000	10,000	271,000	227,000	40,000
10,200	12,000	302,000	253,000	45,000
10,320	12,000	302,000	253,000	45,000
10,500	12,000	302,000	253,000	45,000
10,720	12,000	302,000	253,000	45,000
11,000	12,000	302,000	253,000	45,000
11,110	12,000	323,000	274,000	45,000
11,510	12,000	323,000	274,000	45,000
11,800	12,000	323,000	274,000	45,000
11,910	12,000	323,000	274,000	45,000
12,000	12,000	323,000	274,000	45,000
12,300	14,000	367,000	318,000	45,000
12,500	14,000	367,000	318,000	45,000
12,700	14,000	367,000	318,000	45,000
13,000	14,000	367,000	318,000	45,000
13,100	14,000	367,000	318,000	45,000
13,490	14,000	367,000	318,000	45,000
13,890	14,000	367,000	318,000	45,000
14,000	14,000	367,000	318,000	45,000
14,290	16,000	413,000	361,000	48,000
15,000	16,000	413,000	361,000	48,000
15,870	16,000	413,000	361,000	48,000
16,000	16,000	413,000	361,000	48,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung

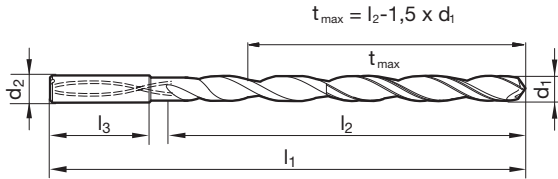


Katalog-Nr. 71765



Arbeitsrichtwerte
Seite 248

- Flächenanschliff
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- Kühlmitteldruck beachten
- zum Pilotieren empfehlen wir den SuperV-AL/Artikel-Nr. 71791 oder SuperV-180/ Artikel-Nr. 51718



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	110,000	70,000	36,000
3,100	6,000	123,000	83,000	36,000
3,170	6,000	123,000	83,000	36,000
3,200	6,000	123,000	83,000	36,000
3,250	6,000	123,000	83,000	36,000
3,300	6,000	123,000	83,000	36,000
3,400	6,000	123,000	83,000	36,000
3,500	6,000	136,000	96,000	36,000
3,570	6,000	136,000	96,000	36,000
3,600	6,000	136,000	96,000	36,000
3,700	6,000	136,000	96,000	36,000
3,800	6,000	136,000	96,000	36,000
3,900	6,000	136,000	96,000	36,000
3,970	6,000	136,000	96,000	36,000
4,000	6,000	136,000	96,000	36,000
4,100	6,000	158,000	118,000	36,000
4,200	6,000	158,000	118,000	36,000
4,300	6,000	158,000	118,000	36,000
4,370	6,000	158,000	118,000	36,000
4,400	6,000	158,000	118,000	36,000
4,500	6,000	158,000	118,000	36,000
4,600	6,000	158,000	118,000	36,000
4,650	6,000	158,000	118,000	36,000
4,700	6,000	158,000	118,000	36,000
4,760	6,000	158,000	118,000	36,000
4,800	6,000	158,000	118,000	36,000
4,900	6,000	158,000	118,000	36,000
5,000	6,000	158,000	118,000	36,000
5,100	6,000	180,000	140,000	36,000
5,160	6,000	180,000	140,000	36,000
5,200	6,000	180,000	140,000	36,000
5,300	6,000	180,000	140,000	36,000
5,400	6,000	180,000	140,000	36,000
5,500	6,000	180,000	140,000	36,000
5,550	6,000	180,000	140,000	36,000
5,560	6,000	180,000	140,000	36,000
5,600	6,000	180,000	140,000	36,000
5,700	6,000	180,000	140,000	36,000
5,800	6,000	180,000	140,000	36,000
5,900	6,000	180,000	140,000	36,000
5,950	6,000	180,000	140,000	36,000
6,000	6,000	180,000	140,000	36,000
6,100	8,000	202,000	162,000	36,000
6,200	8,000	202,000	162,000	36,000
6,300	8,000	202,000	162,000	36,000
6,350	8,000	202,000	162,000	36,000
6,400	8,000	202,000	162,000	36,000
6,500	8,000	202,000	162,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	202,000	162,000	36,000
6,700	8,000	202,000	162,000	36,000
6,750	8,000	202,000	162,000	36,000
6,800	8,000	202,000	162,000	36,000
6,900	8,000	202,000	162,000	36,000
7,000	8,000	202,000	162,000	36,000
7,100	8,000	223,000	183,000	36,000
7,140	8,000	223,000	183,000	36,000
7,200	8,000	223,000	183,000	36,000
7,300	8,000	223,000	183,000	36,000
7,400	8,000	223,000	183,000	36,000
7,500	8,000	223,000	183,000	36,000
7,540	8,000	223,000	183,000	36,000
7,600	8,000	223,000	183,000	36,000
7,700	8,000	223,000	183,000	36,000
7,800	8,000	223,000	183,000	36,000
7,900	8,000	223,000	183,000	36,000
7,940	8,000	223,000	183,000	36,000
8,000	8,000	223,000	183,000	36,000
8,100	10,000	249,000	205,000	40,000
8,200	10,000	249,000	205,000	40,000
8,300	10,000	249,000	205,000	40,000
8,330	10,000	249,000	205,000	40,000
8,400	10,000	249,000	205,000	40,000
8,500	10,000	249,000	205,000	40,000
8,600	10,000	249,000	205,000	40,000
8,700	10,000	249,000	205,000	40,000
8,730	10,000	249,000	205,000	40,000
8,800	10,000	249,000	205,000	40,000
8,900	10,000	249,000	205,000	40,000
9,000	10,000	249,000	205,000	40,000
9,100	10,000	271,000	227,000	40,000
9,130	10,000	271,000	227,000	40,000
9,200	10,000	271,000	227,000	40,000
9,250	10,000	271,000	227,000	40,000
9,300	10,000	271,000	227,000	40,000
9,340	10,000	271,000	227,000	40,000
9,400	10,000	271,000	227,000	40,000
9,500	10,000	271,000	227,000	40,000
9,520	10,000	271,000	227,000	40,000
9,600	10,000	271,000	227,000	40,000
9,700	10,000	271,000	227,000	40,000
9,800	10,000	271,000	227,000	40,000
9,900	10,000	271,000	227,000	40,000
9,920	10,000	271,000	227,000	40,000
10,000	10,000	271,000	227,000	40,000
10,100	12,000	302,000	253,000	45,000
10,200	12,000	302,000	253,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,300	12,000	302,000	253,000	45,000	11,900	12,000	323,000	274,000	45,000
10,320	12,000	302,000	253,000	45,000	11,910	12,000	323,000	274,000	45,000
10,400	12,000	302,000	253,000	45,000	12,000	12,000	323,000	274,000	45,000
10,500	12,000	302,000	253,000	45,000	12,100	14,000	367,000	318,000	45,000
10,600	12,000	302,000	253,000	45,000	12,200	14,000	367,000	318,000	45,000
10,700	12,000	302,000	253,000	45,000	12,500	14,000	367,000	318,000	45,000
10,800	12,000	302,000	253,000	45,000	12,600	14,000	367,000	318,000	45,000
10,900	12,000	302,000	253,000	45,000	12,700	14,000	367,000	318,000	45,000
11,000	12,000	302,000	253,000	45,000	12,800	14,000	367,000	318,000	45,000
11,100	12,000	323,000	274,000	45,000	12,900	14,000	367,000	318,000	45,000
11,110	12,000	323,000	274,000	45,000	13,000	14,000	367,000	318,000	45,000
11,200	12,000	323,000	274,000	45,000	13,100	14,000	367,000	318,000	45,000
11,300	12,000	323,000	274,000	45,000	13,300	14,000	367,000	318,000	45,000
11,400	12,000	323,000	274,000	45,000	13,400	14,000	367,000	318,000	45,000
11,500	12,000	323,000	274,000	45,000	13,500	14,000	367,000	318,000	45,000
11,600	12,000	323,000	274,000	45,000	13,700	14,000	367,000	318,000	45,000
11,700	12,000	323,000	274,000	45,000	13,800	14,000	367,000	318,000	45,000
11,800	12,000	323,000	274,000	45,000	14,000	14,000	367,000	318,000	45,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung

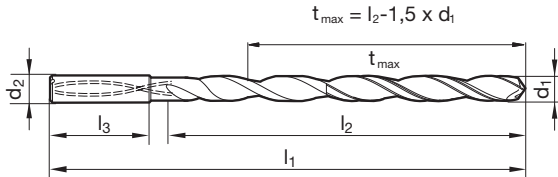


Katalog-Nr. 51766



P	M	K	N	S	H	Arbeitsrichtwerte Seite 246
●	●	●	○	○		

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelschliff
- Kopfbeschichtung
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- vier Führungsfasen
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittelpfehlungen“)



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	125,000	85,000	36,000
3,100	6,000	141,000	101,000	36,000
3,170	6,000	141,000	101,000	36,000
3,200	6,000	141,000	101,000	36,000
3,300	6,000	141,000	101,000	36,000
3,500	6,000	156,000	116,000	36,000
3,570	6,000	156,000	116,000	36,000
3,700	6,000	156,000	116,000	36,000
3,800	6,000	156,000	116,000	36,000
3,970	6,000	156,000	116,000	36,000
4,000	6,000	156,000	116,000	36,000
4,100	6,000	183,000	143,000	36,000
4,200	6,000	183,000	143,000	36,000
4,300	6,000	183,000	143,000	36,000
4,370	6,000	183,000	143,000	36,000
4,500	6,000	183,000	143,000	36,000
4,600	6,000	183,000	143,000	36,000
4,760	6,000	183,000	143,000	36,000
4,800	6,000	183,000	143,000	36,000
5,000	6,000	183,000	143,000	36,000
5,100	6,000	210,000	170,000	36,000
5,160	6,000	210,000	170,000	36,000
5,410	6,000	210,000	170,000	36,000
5,500	6,000	210,000	170,000	36,000
5,560	6,000	210,000	170,000	36,000
5,800	6,000	210,000	170,000	36,000
5,950	6,000	210,000	170,000	36,000
6,000	6,000	210,000	170,000	36,000
6,300	8,000	237,000	197,000	36,000
6,350	8,000	237,000	197,000	36,000
6,500	8,000	237,000	197,000	36,000
6,750	8,000	237,000	197,000	36,000
6,800	8,000	237,000	197,000	36,000
7,000	8,000	237,000	197,000	36,000
7,140	8,000	263,000	223,000	36,000
7,500	8,000	263,000	223,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
7,540	8,000	263,000	223,000	36,000
7,940	8,000	263,000	223,000	36,000
8,000	8,000	263,000	223,000	36,000
8,330	10,000	294,000	250,000	40,000
8,500	10,000	294,000	250,000	40,000
8,730	10,000	294,000	250,000	40,000
8,800	10,000	294,000	250,000	40,000
9,000	10,000	294,000	250,000	40,000
9,130	10,000	321,000	277,000	40,000
9,520	10,000	321,000	277,000	40,000
9,920	10,000	321,000	277,000	40,000
10,000	10,000	321,000	277,000	40,000
10,320	12,000	359,000	310,000	45,000
10,720	12,000	359,000	310,000	45,000
11,000	12,000	359,000	310,000	45,000
11,110	12,000	386,000	337,000	45,000
11,510	12,000	386,000	337,000	45,000
11,910	12,000	386,000	337,000	45,000
12,000	12,000	386,000	337,000	45,000
12,300	14,000	437,000	388,000	45,000
12,700	14,000	437,000	388,000	45,000
13,000	14,000	437,000	388,000	45,000
13,100	14,000	437,000	388,000	45,000
13,490	14,000	437,000	388,000	45,000
13,890	14,000	437,000	388,000	45,000
14,000	14,000	437,000	388,000	45,000
14,290	16,000	493,000	441,000	48,000
15,000	16,000	493,000	441,000	48,000
15,870	16,000	493,000	441,000	48,000
16,000	16,000	493,000	441,000	48,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



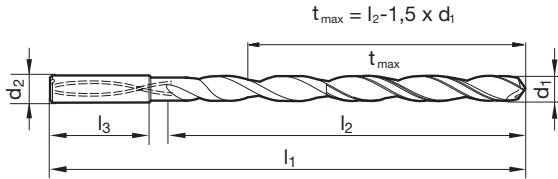
Katalog-Nr. 71766



P	M	K	N	S	H
			•		

Arbeitsrichtwerte
Seite 248

- Flächenanschliff
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- Kühlmitteldruck beachten
- zum Pilotieren empfehlen wir den SuperV-AL/Katalog-Nr. 71791 oder SuperV-180/ Katalog-Nr. 51718



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	125,000	85,000	36,000
3,100	6,000	141,000	101,000	36,000
3,170	6,000	141,000	101,000	36,000
3,200	6,000	141,000	101,000	36,000
3,250	6,000	141,000	101,000	36,000
3,300	6,000	141,000	101,000	36,000
3,400	6,000	141,000	101,000	36,000
3,500	6,000	156,000	116,000	36,000
3,570	6,000	156,000	116,000	36,000
3,600	6,000	156,000	116,000	36,000
3,700	6,000	156,000	116,000	36,000
3,800	6,000	156,000	116,000	36,000
3,900	6,000	156,000	116,000	36,000
3,970	6,000	156,000	116,000	36,000
4,000	6,000	156,000	116,000	36,000
4,100	6,000	183,000	143,000	36,000
4,200	6,000	183,000	143,000	36,000
4,300	6,000	183,000	143,000	36,000
4,370	6,000	183,000	143,000	36,000
4,400	6,000	183,000	143,000	36,000
4,500	6,000	183,000	143,000	36,000
4,600	6,000	183,000	143,000	36,000
4,650	6,000	183,000	143,000	36,000
4,700	6,000	183,000	143,000	36,000
4,760	6,000	183,000	143,000	36,000
4,800	6,000	183,000	143,000	36,000
4,900	6,000	183,000	143,000	36,000
5,000	6,000	183,000	143,000	36,000
5,100	6,000	210,000	170,000	36,000
5,160	6,000	210,000	170,000	36,000
5,200	6,000	210,000	170,000	36,000
5,300	6,000	210,000	170,000	36,000
5,400	6,000	210,000	170,000	36,000
5,500	6,000	210,000	170,000	36,000
5,550	6,000	210,000	170,000	36,000
5,560	6,000	210,000	170,000	36,000
5,600	6,000	210,000	170,000	36,000
5,700	6,000	210,000	170,000	36,000
5,800	6,000	210,000	170,000	36,000
5,900	6,000	210,000	170,000	36,000
5,950	6,000	210,000	170,000	36,000
6,000	6,000	210,000	170,000	36,000
6,100	8,000	237,000	197,000	36,000
6,200	8,000	237,000	197,000	36,000
6,300	8,000	237,000	197,000	36,000
6,350	8,000	237,000	197,000	36,000
6,400	8,000	237,000	197,000	36,000
6,500	8,000	237,000	197,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,600	8,000	237,000	197,000	36,000
6,700	8,000	237,000	197,000	36,000
6,750	8,000	237,000	197,000	36,000
6,800	8,000	237,000	197,000	36,000
6,900	8,000	237,000	197,000	36,000
7,000	8,000	237,000	197,000	36,000
7,100	8,000	263,000	223,000	36,000
7,140	8,000	263,000	223,000	36,000
7,200	8,000	263,000	223,000	36,000
7,300	8,000	263,000	223,000	36,000
7,400	8,000	263,000	223,000	36,000
7,500	8,000	263,000	223,000	36,000
7,540	8,000	263,000	223,000	36,000
7,600	8,000	263,000	223,000	36,000
7,700	8,000	263,000	223,000	36,000
7,800	8,000	263,000	223,000	36,000
7,900	8,000	263,000	223,000	36,000
7,940	8,000	263,000	223,000	36,000
8,000	8,000	263,000	223,000	36,000
8,100	10,000	294,000	250,000	40,000
8,200	10,000	294,000	250,000	40,000
8,300	10,000	294,000	250,000	40,000
8,330	10,000	294,000	250,000	40,000
8,400	10,000	294,000	250,000	40,000
8,500	10,000	294,000	250,000	40,000
8,600	10,000	294,000	250,000	40,000
8,700	10,000	294,000	250,000	40,000
8,730	10,000	294,000	250,000	40,000
8,800	10,000	294,000	250,000	40,000
8,900	10,000	294,000	250,000	40,000
9,000	10,000	294,000	250,000	40,000
9,100	10,000	321,000	277,000	40,000
9,130	10,000	321,000	277,000	40,000
9,200	10,000	321,000	277,000	40,000
9,250	10,000	321,000	277,000	40,000
9,300	10,000	321,000	277,000	40,000
9,340	10,000	321,000	277,000	40,000
9,400	10,000	321,000	277,000	40,000
9,500	10,000	321,000	277,000	40,000
9,520	10,000	321,000	277,000	40,000
9,600	10,000	321,000	277,000	40,000
9,700	10,000	321,000	277,000	40,000
9,800	10,000	321,000	277,000	40,000
9,900	10,000	321,000	277,000	40,000
9,920	10,000	321,000	277,000	40,000
10,000	10,000	321,000	277,000	40,000
10,100	12,000	359,000	310,000	45,000
10,200	12,000	359,000	310,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,300	12,000	359,000	310,000	45,000	11,900	12,000	386,000	337,000	45,000
10,320	12,000	359,000	310,000	45,000	11,910	12,000	386,000	337,000	45,000
10,400	12,000	359,000	310,000	45,000	12,000	12,000	386,000	337,000	45,000
10,500	12,000	359,000	310,000	45,000	12,100	14,000	437,000	388,000	45,000
10,600	12,000	359,000	310,000	45,000	12,200	14,000	437,000	388,000	45,000
10,700	12,000	359,000	310,000	45,000	12,500	14,000	437,000	388,000	45,000
10,800	12,000	359,000	310,000	45,000	12,600	14,000	437,000	388,000	45,000
10,900	12,000	359,000	310,000	45,000	12,700	14,000	437,000	388,000	45,000
11,000	12,000	359,000	310,000	45,000	12,800	14,000	437,000	388,000	45,000
11,100	12,000	386,000	337,000	45,000	12,900	14,000	437,000	388,000	45,000
11,110	12,000	386,000	337,000	45,000	13,000	14,000	437,000	388,000	45,000
11,200	12,000	386,000	337,000	45,000	13,100	14,000	437,000	388,000	45,000
11,300	12,000	386,000	337,000	45,000	13,300	14,000	437,000	388,000	45,000
11,400	12,000	386,000	337,000	45,000	13,400	14,000	437,000	388,000	45,000
11,500	12,000	386,000	337,000	45,000	13,500	14,000	437,000	388,000	45,000
11,600	12,000	386,000	337,000	45,000	13,700	14,000	437,000	388,000	45,000
11,700	12,000	386,000	337,000	45,000	13,800	14,000	437,000	388,000	45,000
11,800	12,000	386,000	337,000	45,000	14,000	14,000	437,000	388,000	45,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



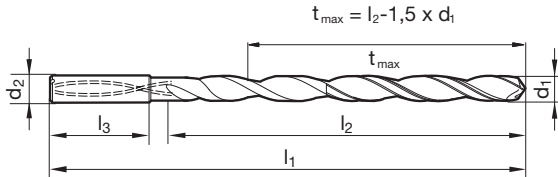
Katalog-Nr. 51767



P	M	K	N	S	H
●	●	●	○	○	○

Arbeitsrichtwerte
Seite 246

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelanschiff
- Kopfbeschichtung
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- vier Führungsfasen
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	140,000	100,000	36,000
3,100	6,000	158,000	118,000	36,000
3,170	6,000	158,000	118,000	36,000
3,200	6,000	158,000	118,000	36,000
3,300	6,000	158,000	118,000	36,000
3,500	6,000	176,000	136,000	36,000
3,570	6,000	176,000	136,000	36,000
3,700	6,000	176,000	136,000	36,000
3,800	6,000	176,000	136,000	36,000
3,970	6,000	176,000	136,000	36,000
4,000	6,000	176,000	136,000	36,000
4,100	6,000	208,000	168,000	36,000
4,200	6,000	208,000	168,000	36,000
4,370	6,000	208,000	168,000	36,000
4,500	6,000	208,000	168,000	36,000
4,760	6,000	208,000	168,000	36,000
5,000	6,000	208,000	168,000	36,000
5,100	6,000	240,000	200,000	36,000
5,160	6,000	240,000	200,000	36,000
5,410	6,000	240,000	200,000	36,000
5,500	6,000	240,000	200,000	36,000
5,560	6,000	240,000	200,000	36,000
5,950	6,000	240,000	200,000	36,000
6,000	6,000	240,000	200,000	36,000
6,300	8,000	272,000	232,000	36,000
6,350	8,000	272,000	232,000	36,000
6,500	8,000	272,000	232,000	36,000
6,750	8,000	272,000	232,000	36,000
6,800	8,000	272,000	232,000	36,000
7,000	8,000	272,000	232,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
7,140	8,000	303,000	263,000	36,000
7,500	8,000	303,000	263,000	36,000
7,540	8,000	303,000	263,000	36,000
7,940	8,000	303,000	263,000	36,000
8,000	8,000	303,000	263,000	36,000
8,330	10,000	339,000	295,000	40,000
8,500	10,000	339,000	295,000	40,000
8,730	10,000	339,000	295,000	40,000
8,800	10,000	339,000	295,000	40,000
9,000	10,000	339,000	295,000	40,000
9,130	10,000	371,000	327,000	40,000
9,520	10,000	371,000	327,000	40,000
9,920	10,000	371,000	327,000	40,000
10,000	10,000	371,000	327,000	40,000
10,320	12,000	412,000	363,000	45,000
10,720	12,000	412,000	363,000	45,000
11,000	12,000	412,000	363,000	45,000
11,110	12,000	443,000	394,000	45,000
11,510	12,000	443,000	394,000	45,000
11,910	12,000	443,000	394,000	45,000
12,000	12,000	443,000	394,000	45,000
12,300	14,000	507,000	458,000	45,000
12,700	14,000	507,000	458,000	45,000
13,000	14,000	507,000	458,000	45,000
13,100	14,000	507,000	458,000	45,000
13,490	14,000	507,000	458,000	45,000
13,890	14,000	507,000	458,000	45,000
14,000	14,000	507,000	458,000	45,000

SuperV-Bohrer

SuperV-Bohrer mit Innenkühlung



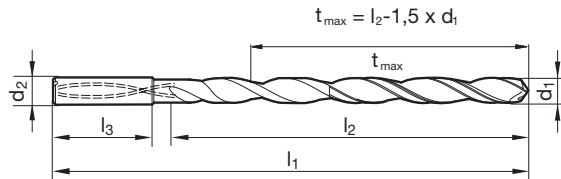
Katalog-Nr. 51768



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 246

- Ausspitzung $\geq \varnothing 3,000$
- Kegelmantelschliff
- Kopfbeschichtung
- Hauptschneidenform konkav
- optimierter Nutquerschnitt
- maximaler Kühlkanalquerschnitt
- vier Führungsfasen
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	170,000	130,000	36,000
3,100	6,000	193,000	153,000	36,000
3,170	6,000	193,000	153,000	36,000
3,200	6,000	193,000	153,000	36,000
3,300	6,000	193,000	153,000	36,000
3,500	6,000	193,000	153,000	36,000
3,570	6,000	216,000	176,000	36,000
3,800	6,000	216,000	176,000	36,000
3,970	6,000	216,000	176,000	36,000
4,000	6,000	216,000	176,000	36,000
4,200	6,000	238,000	198,000	36,000
4,370	6,000	238,000	198,000	36,000
4,500	6,000	238,000	198,000	36,000
4,760	6,000	258,000	218,000	36,000
5,000	6,000	258,000	218,000	36,000
5,100	6,000	280,000	240,000	36,000
5,160	6,000	280,000	240,000	36,000
5,410	6,000	280,000	240,000	36,000

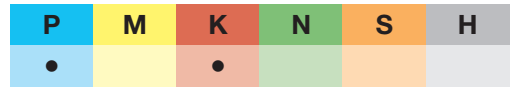
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
5,500	6,000	280,000	240,000	36,000
5,560	6,000	300,000	260,000	36,000
5,950	6,000	300,000	260,000	36,000
6,000	6,000	300,000	260,000	36,000
6,300	8,000	322,000	282,000	36,000
6,350	8,000	322,000	282,000	36,000
6,500	8,000	322,000	282,000	36,000
6,750	8,000	342,000	302,000	36,000
6,800	8,000	342,000	302,000	36,000
7,000	8,000	342,000	302,000	36,000
7,140	8,000	363,000	323,000	36,000
7,500	8,000	363,000	323,000	36,000
7,540	8,000	383,000	343,000	36,000
7,940	8,000	383,000	343,000	36,000
8,000	8,000	383,000	343,000	36,000
8,500	10,000	409,000	365,000	40,000
9,000	10,000	429,000	386,000	40,000
10,000	10,000	471,000	427,000	40,000

SuperV-Bohrer

SuperV-M Universal-Kleinstbohrer

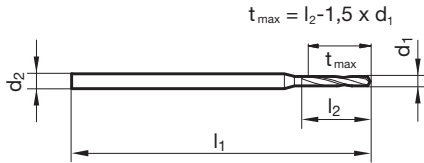


Katalog-Nr. 51720



Arbeitsrichtwerte
Seite 250

- Ausspitzung $\geq \varnothing 0,800$
- Flächenanschliff
- Hauptschneidenform gerade



d1 mm	inch	d2 mm	l1 mm	l2 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm
0,100		3,000	38,000	1,200	0,580		3,000	38,000	7,000
0,110		3,000	38,000	1,200	0,590		3,000	38,000	7,000
0,120		3,000	38,000	1,400	0,600		3,000	38,000	7,000
0,130		3,000	38,000	1,400	0,610		3,000	38,000	7,000
0,140		3,000	38,000	1,400	0,620		3,000	38,000	7,000
0,150		3,000	38,000	2,000	0,630		3,000	38,000	7,000
0,160		3,000	38,000	2,000	0,640		3,000	38,000	7,000
0,170		3,000	38,000	2,000	0,650		3,000	38,000	7,000
0,180		3,000	38,000	2,000	0,660		3,000	38,000	7,000
0,190		3,000	38,000	2,000	0,670		3,000	38,000	7,000
0,200		3,000	38,000	2,500	0,680		3,000	38,000	7,000
0,210		3,000	38,000	2,500	0,690		3,000	38,000	7,000
0,220		3,000	38,000	2,500	0,700		3,000	38,000	8,000
0,230		3,000	38,000	2,500	0,710		3,000	38,000	8,000
0,240		3,000	38,000	2,500	0,720		3,000	38,000	8,000
0,250		3,000	38,000	3,000	0,730		3,000	38,000	8,000
0,260		3,000	38,000	3,000	0,740		3,000	38,000	8,000
0,270		3,000	38,000	3,000	0,750		3,000	38,000	8,000
0,280		3,000	38,000	3,000	0,760		3,000	38,000	8,000
0,290		3,000	38,000	3,000	0,770		3,000	38,000	8,000
0,300		3,000	38,000	5,000	0,780		3,000	38,000	8,000
0,310		3,000	38,000	5,000	0,790	1/32	3,000	38,000	8,000
0,320		3,000	38,000	5,000	0,800		3,000	38,000	10,000
0,330		3,000	38,000	5,000	0,810		3,000	38,000	10,000
0,340		3,000	38,000	5,000	0,820		3,000	38,000	10,000
0,350		3,000	38,000	6,000	0,830		3,000	38,000	10,000
0,360		3,000	38,000	6,000	0,840		3,000	38,000	10,000
0,370		3,000	38,000	6,000	0,850		3,000	38,000	10,000
0,380		3,000	38,000	6,000	0,860		3,000	38,000	10,000
0,390		3,000	38,000	6,000	0,870		3,000	38,000	10,000
0,400		3,000	38,000	7,000	0,880		3,000	38,000	10,000
0,410		3,000	38,000	7,000	0,890		3,000	38,000	10,000
0,420		3,000	38,000	7,000	0,900		3,000	38,000	10,000
0,430		3,000	38,000	7,000	0,910		3,000	38,000	10,000
0,440		3,000	38,000	7,000	0,920		3,000	38,000	10,000
0,450		3,000	38,000	7,000	0,930		3,000	38,000	10,000
0,460		3,000	38,000	7,000	0,940		3,000	38,000	10,000
0,470		3,000	38,000	7,000	0,950		3,000	38,000	10,000
0,480		3,000	38,000	7,000	0,960		3,000	38,000	10,000
0,490		3,000	38,000	7,000	0,970		3,000	38,000	10,000
0,500		3,000	38,000	7,000	0,980		3,000	38,000	10,000
0,510		3,000	38,000	7,000	0,990		3,000	38,000	10,000
0,520		3,000	38,000	7,000	1,000		3,000	38,000	10,000
0,530		3,000	38,000	7,000	1,010		3,000	38,000	10,000
0,540		3,000	38,000	7,000	1,020		3,000	38,000	10,000
0,550		3,000	38,000	7,000	1,030		3,000	38,000	10,000
0,560		3,000	38,000	7,000	1,040		3,000	38,000	10,000
0,570		3,000	38,000	7,000	1,050		3,000	38,000	10,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm
1,060		3,000	38,000	10,000	1,660		3,000	38,000	12,000
1,070		3,000	38,000	10,000	1,670		3,000	38,000	12,000
1,080		3,000	38,000	10,000	1,680		3,000	38,000	12,000
1,090		3,000	38,000	10,000	1,690		3,000	38,000	12,000
1,100		3,000	38,000	10,000	1,700		3,000	38,000	12,000
1,110		3,000	38,000	10,000	1,710		3,000	38,000	12,000
1,120		3,000	38,000	10,000	1,720		3,000	38,000	12,000
1,130		3,000	38,000	10,000	1,730		3,000	38,000	12,000
1,140		3,000	38,000	10,000	1,740		3,000	38,000	12,000
1,150		3,000	38,000	10,000	1,750		3,000	38,000	12,000
1,160		3,000	38,000	10,000	1,760		3,000	38,000	12,000
1,170		3,000	38,000	10,000	1,770		3,000	38,000	12,000
1,180		3,000	38,000	10,000	1,780		3,000	38,000	12,000
1,190		3,000	38,000	10,000	1,790		3,000	38,000	12,000
1,200		3,000	38,000	10,000	1,800		3,000	38,000	12,000
1,210		3,000	38,000	10,000	1,810		3,000	38,000	12,000
1,220		3,000	38,000	10,000	1,820		3,000	38,000	12,000
1,230		3,000	38,000	10,000	1,830		3,000	38,000	12,000
1,240		3,000	38,000	10,000	1,840		3,000	38,000	12,000
1,250		3,000	38,000	10,000	1,850		3,000	38,000	12,000
1,260		3,000	38,000	10,000	1,860		3,000	38,000	12,000
1,270		3,000	38,000	10,000	1,870		3,000	38,000	12,000
1,280		3,000	38,000	10,000	1,880		3,000	38,000	12,000
1,290		3,000	38,000	10,000	1,890		3,000	38,000	12,000
1,300		3,000	38,000	10,000	1,900		3,000	38,000	12,000
1,310		3,000	38,000	10,000	1,910		3,000	38,000	12,000
1,320		3,000	38,000	10,000	1,920		3,000	38,000	12,000
1,330		3,000	38,000	10,000	1,930		3,000	38,000	12,000
1,340		3,000	38,000	10,000	1,940		3,000	38,000	12,000
1,350		3,000	38,000	10,000	1,950		3,000	38,000	12,000
1,360		3,000	38,000	10,000	1,960		3,000	38,000	12,000
1,370		3,000	38,000	10,000	1,970		3,000	38,000	12,000
1,380		3,000	38,000	10,000	1,980	5/64	3,000	38,000	12,000
1,390		3,000	38,000	10,000	1,990		3,000	38,000	12,000
1,400		3,000	38,000	10,000	2,000		3,000	38,000	12,000
1,410		3,000	38,000	10,000	2,050		3,000	38,000	12,000
1,420		3,000	38,000	10,000	2,100		3,000	38,000	12,000
1,430		3,000	38,000	10,000	2,150		3,000	38,000	12,000
1,440		3,000	38,000	10,000	2,200		3,000	38,000	12,000
1,450		3,000	38,000	10,000	2,250		3,000	38,000	12,000
1,460		3,000	38,000	10,000	2,300		3,000	38,000	12,000
1,470		3,000	38,000	10,000	2,350		3,000	38,000	12,000
1,480		3,000	38,000	10,000	2,400		3,000	38,000	12,000
1,490		3,000	38,000	10,000	2,450		3,000	38,000	12,000
1,500		3,000	38,000	10,000	2,500		3,000	38,000	12,000
1,510		3,000	38,000	10,000	2,550		3,000	38,000	12,000
1,520		3,000	38,000	10,000	2,600		3,000	38,000	12,000
1,530		3,000	38,000	10,000	2,700		3,000	38,000	12,000
1,540		3,000	38,000	10,000	2,750		3,000	38,000	12,000
1,550		3,000	38,000	10,000	2,800		3,000	38,000	12,000
1,560		3,000	38,000	10,000	2,900		3,000	38,000	12,000
1,570		3,000	38,000	10,000	2,950		3,000	38,000	12,000
1,580		3,000	38,000	10,000	3,000		3,000	38,000	12,000
1,590		3,000	38,000	10,000					
1,600		3,000	38,000	12,000					
1,610		3,000	38,000	12,000					
1,620		3,000	38,000	12,000					
1,630		3,000	38,000	12,000					
1,640		3,000	38,000	12,000					
1,650		3,000	38,000	12,000					

SuperV-Bohrer

SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung

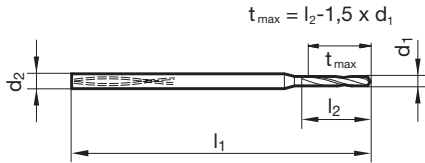


Katalog-Nr. 51997



P	M	K	N	S	H	Arbeitsrichtwerte Seite 250
●	●	●	○	○		

- Ausspitzung $\geq \varnothing 1,400$
- Flächenanschliff
- Hauptschneidenform gerade
- geschliffener Schneidenabzug
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	inch	d2 mm	l1 mm	l2 mm
1,000		3,000	48,000	8,000
1,020		3,000	48,000	8,500
1,050		3,000	48,000	8,500
1,100		3,000	48,000	9,000
1,150		3,000	48,000	9,500
1,180		3,000	48,000	9,500
1,190		3,000	48,000	10,000
1,200		3,000	48,000	10,000
1,250		3,000	48,000	10,000
1,280		3,000	48,000	10,500
1,300		3,000	48,000	10,500
1,350		3,000	48,000	11,000
1,400		4,000	52,000	11,000
1,450		4,000	52,000	12,000
1,500		4,000	52,000	12,000
1,550	1/16	4,000	52,000	12,000
1,590		4,000	52,000	13,000
1,600		4,000	52,000	13,000
1,650		4,000	52,000	13,000
1,700		4,000	56,000	14,000
1,750		4,000	56,000	14,000
1,800		4,000	56,000	14,000
1,850		4,000	56,000	15,000
1,900		4,000	56,000	15,000
1,950	5/64	4,000	56,000	16,000
1,980		4,000	56,000	16,000
2,000		4,000	56,000	16,000
2,050		4,000	56,000	16,000
2,100		4,000	62,000	17,000
2,150		4,000	62,000	17,000

d1 mm	inch	d2 mm	l1 mm	l2 mm
2,200		4,000	62,000	18,000
2,250		4,000	62,000	18,000
2,300		4,000	62,000	18,000
2,350	3/32	4,000	62,000	19,000
2,380		4,000	62,000	19,000
2,400		4,000	62,000	19,000
2,450		4,000	62,000	20,000
2,500		4,000	62,000	20,000
2,550		4,000	62,000	20,000
2,600		4,000	66,000	21,000
2,650		4,000	66,000	21,000
2,700		4,000	66,000	22,000
2,750	7/64	4,000	66,000	22,000
2,780		4,000	66,000	22,000
2,800		4,000	66,000	22,000
2,850		4,000	66,000	23,000
2,900		4,000	66,000	23,000
2,950		4,000	66,000	24,000
3,000		4,000	66,000	24,000

SuperV-Bohrer

SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung

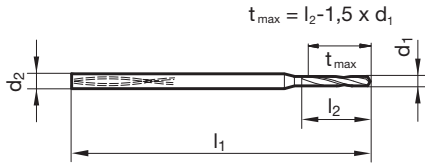


Katalog-Nr. 51998



P	M	K	N	S	H	Arbeitsrichtwerte Seite 250
●	●	●	○	○		

- Ausspitzung $\geq \varnothing 1,400$
- Flächenanschliff
- Hauptschneidenform gerade
- geschliffener Schneidenabzug
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	inch	d2 mm	l1 mm	l2 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm
1,000		3,000	48,000	11,000	2,200		4,000	62,000	24,000
1,020		3,000	48,000	11,500	2,250		4,000	62,000	25,000
1,050		3,000	48,000	12,000	2,300		4,000	62,000	25,000
1,100		3,000	48,000	12,500	2,350		4,000	62,000	26,000
1,150		3,000	48,000	13,000	2,380	3/32	4,000	62,000	26,000
1,180		3,000	48,000	13,000	2,400		4,000	62,000	26,000
1,190		3,000	48,000	13,500	2,450		4,000	62,000	27,000
1,200		3,000	48,000	13,500	2,500		4,000	62,000	28,000
1,250		3,000	48,000	14,000	2,550		4,000	62,000	28,000
1,280		3,000	48,000	14,500	2,600		4,000	66,000	29,000
1,300		3,000	48,000	14,500	2,650		4,000	66,000	29,000
1,350		3,000	48,000	15,000	2,700		4,000	66,000	30,000
1,400		4,000	52,000	15,000	2,750		4,000	66,000	30,000
1,450		4,000	52,000	16,000	2,780	7/64	4,000	66,000	31,000
1,500		4,000	52,000	17,000	2,800		4,000	66,000	31,000
1,550		4,000	52,000	17,000	2,850		4,000	66,000	31,000
1,590	1/16	4,000	52,000	18,000	2,900		4,000	66,000	32,000
1,600		4,000	52,000	18,000	2,950		4,000	66,000	32,000
1,650		4,000	52,000	18,000	3,000		4,000	66,000	33,000
1,700		4,000	56,000	19,000					
1,750		4,000	56,000	19,000					
1,800		4,000	56,000	20,000					
1,850		4,000	56,000	20,000					
1,900		4,000	56,000	21,000					
1,950		4,000	56,000	21,000					
1,980	5/64	4,000	56,000	22,000					
2,000		4,000	56,000	22,000					
2,050		4,000	56,000	23,000					
2,100		4,000	62,000	23,000					
2,150		4,000	62,000	24,000					

SuperV-Bohrer

SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung

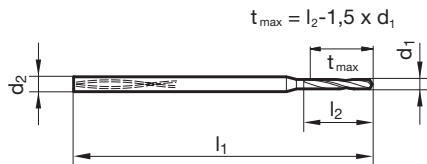


Katalog-Nr. 51999



P	M	K	N	S	H	Arbeitsrichtwerte Seite 250
●	●	●	○	○		

- Ausspitzung $\geq \varnothing 1,400$
- Flächenanschliff
- Kopfbeschichtung
- Hauptschneidenform gerade
- geschliffener Schneidenabzug
- Kühlmitteldruck beachten (s. Diagramm „Kühlmittlempfehlungen“)



d1 mm	inch	d2 mm	l1 mm	l2 mm
1,000		3,000	56,000	18,000
1,020		3,000	56,000	18,500
1,050		3,000	56,000	19,000
1,100		3,000	56,000	20,000
1,150		3,000	56,000	21,000
1,180		3,000	56,000	21,500
1,190		3,000	56,000	21,500
1,200		3,000	56,000	22,000
1,250		3,000	56,000	22,500
1,280		3,000	56,000	23,500
1,300		3,000	56,000	23,500
1,350		3,000	56,000	24,500
1,400		4,000	62,000	25,000
1,500		4,000	62,000	27,000
1,590	1/16	4,000	62,000	29,000
1,600		4,000	62,000	29,000
1,700		4,000	70,000	31,000
1,800		4,000	70,000	32,000

d1 mm	inch	d2 mm	l1 mm	l2 mm
1,900		4,000	70,000	34,000
1,980	5/64	4,000	70,000	36,000
2,000		4,000	70,000	36,000
2,100		4,000	78,000	38,000
2,200		4,000	78,000	40,000
2,300		4,000	78,000	42,000
2,380	3/32	4,000	78,000	44,000
2,400		4,000	78,000	44,000
2,500		4,000	78,000	45,000
2,600		4,000	87,000	47,000
2,700		4,000	87,000	48,000
2,780	7/64	4,000	87,000	50,000
2,800		4,000	87,000	50,000
2,900		4,000	87,000	52,000
3,000		4,000	87,000	54,000

SuperV-Bohrer

SuperV-NX U Hochleistungs-Kleinstbohrer mit Innenkühlung



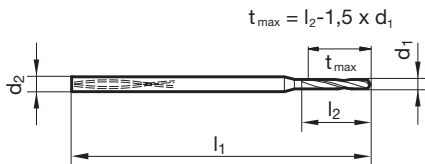
Katalog-Nr. 51980



P	M	K	N	S	H
●	●	●	○	○	○

 Arbeitsrichtwerte
Seite 250

- Ausspitzung $\geq \varnothing 1,000$
- Flächenanschliff
- Hauptschneidenform gerade
- mit Hauptschneidenabzug
- Kopfbeschichtung



d1 mm	d2 mm	l1 mm	l2 mm
1,000	3,000	59,000	23,000
1,050	3,000	59,000	24,200
1,100	3,000	59,000	25,300
1,150	3,000	63,000	26,500
1,190	3,000	63,000	27,400
1,200	3,000	63,000	27,600
1,250	3,000	63,000	28,800
1,300	3,000	68,000	29,900
1,350	3,000	68,000	31,100
1,400	4,000	70,000	32,200
1,450	4,000	70,000	33,400
1,500	4,000	70,000	34,500
1,550	4,000	70,000	35,700
1,590	4,000	70,000	36,600
1,600	4,000	70,000	36,800
1,650	4,000	70,000	38,000
1,700	4,000	79,000	39,400
1,750	4,000	79,000	40,300
1,800	4,000	79,000	41,400
1,850	4,000	79,000	42,600
1,900	4,000	79,000	43,700
1,950	4,000	79,000	44,900
1,980	4,000	79,000	45,600
2,000	4,000	79,000	46,000

d1 mm	d2 mm	l1 mm	l2 mm
2,050	4,000	79,000	47,200
2,100	4,000	91,000	48,300
2,150	4,000	91,000	49,500
2,200	4,000	91,000	50,600
2,250	4,000	91,000	51,800
2,300	4,000	91,000	52,900
2,320	4,000	91,000	54,100
2,350	4,000	91,000	54,100
2,380	4,000	91,000	54,800
2,400	4,000	91,000	55,200
2,450	4,000	91,000	56,400
2,500	4,000	91,000	57,500
2,550	4,000	91,000	58,700
2,600	4,000	102,000	59,800
2,650	4,000	102,000	61,000
2,700	4,000	102,000	62,100
2,750	4,000	102,000	63,300
2,780	4,000	102,000	64,000
2,800	4,000	102,000	64,400
2,850	4,000	102,000	65,600
2,900	4,000	102,000	66,700
2,950	4,000	102,000	67,900
3,000	4,000	102,000	69,000

SuperV-Bohrer

SuperV-NX VA Hochleistungs-Kleinstbohrer ohne Innenkühlung



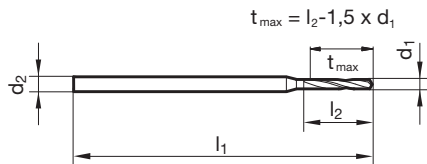
Katalog-Nr. 51970



P	M	K	N	S	H
○	●		○	●	

Arbeitsrichtwerte
Seite 252

- Flächenanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm
0,500	3,000	38,000	2,800
0,550	3,000	38,000	3,100
0,600	3,000	38,000	3,300
0,650	3,000	38,000	3,600
0,660	3,000	38,000	3,700
0,700	3,000	38,000	3,900
0,740	3,000	38,000	4,100
0,750	3,000	38,000	4,200
0,790	3,000	38,000	4,400
0,800	3,000	38,000	4,400
0,820	3,000	38,000	4,600
0,850	3,000	38,000	4,700
0,900	3,000	38,000	5,000
0,950	3,000	38,000	5,300
1,000	3,000	38,000	5,500
1,020	3,000	38,000	5,700
1,050	3,000	38,000	5,800
1,100	3,000	38,000	6,100
1,150	3,000	38,000	6,400
1,180	3,000	38,000	6,500
1,190	3,000	38,000	6,600
1,200	3,000	38,000	6,600
1,250	3,000	38,000	6,900
1,280	3,000	38,000	7,100
1,300	3,000	38,000	7,200
1,350	3,000	38,000	7,500
1,400	4,000	46,000	7,700
1,450	4,000	46,000	8,000
1,460	4,000	46,000	8,100
1,500	4,000	46,000	8,300
1,550	4,000	46,000	8,600
1,560	4,000	46,000	8,600
1,590	4,000	46,000	8,800
1,600	4,000	46,000	8,800
1,650	4,000	46,000	9,100
1,660	4,000	46,000	9,200

d1 mm	d2 mm	l1 mm	l2 mm
1,700	4,000	46,000	9,400
1,750	4,000	46,000	9,700
1,800	4,000	46,000	9,900
1,850	4,000	46,000	10,200
1,900	4,000	46,000	10,500
1,950	4,000	46,000	10,800
1,980	4,000	46,000	10,900
2,000	4,000	46,000	11,000
2,050	4,000	46,000	11,300
2,100	4,000	50,000	11,600
2,150	4,000	50,000	11,900
2,200	4,000	50,000	12,100
2,250	4,000	50,000	12,400
2,300	4,000	50,000	12,700
2,350	4,000	50,000	13,000
2,380	4,000	50,000	13,100
2,400	4,000	50,000	13,200
2,450	4,000	50,000	13,500
2,500	4,000	50,000	13,800
2,550	4,000	50,000	14,100
2,600	4,000	50,000	14,300
2,650	4,000	50,000	14,600
2,700	4,000	50,000	14,900
2,750	4,000	50,000	15,200
2,780	4,000	50,000	15,300
2,800	4,000	50,000	15,400
2,850	4,000	50,000	15,700
2,900	4,000	50,000	16,000
2,950	4,000	50,000	16,300
3,000	4,000	50,000	16,500

SuperV-Bohrer

SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung



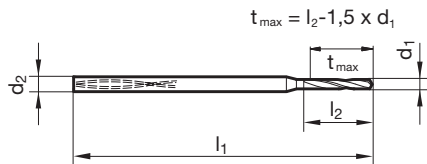
Katalog-Nr. 51971



P	M	K	N	S	H
○	●		○	●	

 Arbeitsrichtwerte
Seite 252

- Flächenanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm
1,000	3,000	38,000	5,500
1,020	3,000	38,000	5,700
1,050	3,000	38,000	5,800
1,100	3,000	38,000	6,100
1,150	3,000	38,000	6,400
1,180	3,000	38,000	6,500
1,190	3,000	38,000	6,600
1,200	3,000	38,000	6,600
1,250	3,000	38,000	6,900
1,280	3,000	38,000	7,100
1,300	3,000	38,000	7,200
1,350	3,000	38,000	7,500
1,400	4,000	46,000	7,700
1,450	4,000	46,000	8,000
1,460	4,000	46,000	8,100
1,500	4,000	46,000	8,300
1,550	4,000	46,000	8,600
1,560	4,000	46,000	8,600
1,590	4,000	46,000	8,800
1,600	4,000	46,000	8,800
1,650	4,000	46,000	9,100
1,660	4,000	46,000	9,200
1,700	4,000	46,000	9,400
1,750	4,000	46,000	9,700
1,800	4,000	46,000	9,900
1,850	4,000	46,000	10,200
1,900	4,000	46,000	10,500
1,950	4,000	46,000	10,800
1,980	4,000	46,000	10,900
2,000	4,000	46,000	11,000

d1 mm	d2 mm	l1 mm	l2 mm
2,050	4,000	46,000	11,300
2,100	4,000	50,000	11,600
2,150	4,000	50,000	11,900
2,200	4,000	50,000	12,100
2,250	4,000	50,000	12,400
2,300	4,000	50,000	12,700
2,350	4,000	50,000	13,000
2,380	4,000	50,000	13,100
2,400	4,000	50,000	13,200
2,450	4,000	50,000	13,500
2,500	4,000	50,000	13,800
2,550	4,000	50,000	14,100
2,600	4,000	50,000	14,300
2,650	4,000	50,000	14,600
2,700	4,000	50,000	14,900
2,750	4,000	50,000	15,200
2,780	4,000	50,000	15,300
2,800	4,000	50,000	15,400
2,850	4,000	50,000	15,700
2,900	4,000	50,000	16,000
2,950	4,000	50,000	16,300
3,000	4,000	50,000	16,500

SuperV-Bohrer

SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung



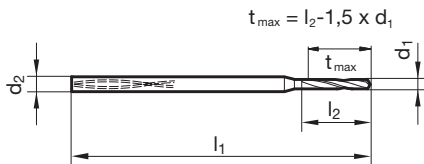
Katalog-Nr. 51972



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 252

- Flächenanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm
1,000	3,000	48,000	9,000
1,050	3,000	48,000	9,500
1,100	3,000	48,000	9,900
1,150	3,000	48,000	10,400
1,190	3,000	48,000	10,800
1,200	3,000	51,000	10,800
1,250	3,000	51,000	11,300
1,300	3,000	51,000	11,700
1,350	3,000	51,000	12,200
1,400	4,000	56,000	12,600
1,450	4,000	56,000	13,100
1,500	4,000	56,000	13,500
1,550	4,000	56,000	14,000
1,590	4,000	56,000	14,400
1,600	4,000	56,000	14,400
1,650	4,000	56,000	14,900
1,700	4,000	61,000	15,300
1,750	4,000	61,000	15,800
1,800	4,000	61,000	16,200
1,850	4,000	61,000	16,700
1,900	4,000	61,000	17,100
1,950	4,000	61,000	17,600
1,980	4,000	61,000	17,900
2,000	4,000	61,000	18,000

d1 mm	d2 mm	l1 mm	l2 mm
2,050	4,000	61,000	18,500
2,100	4,000	66,000	18,900
2,150	4,000	66,000	19,400
2,200	4,000	66,000	19,800
2,250	4,000	66,000	20,300
2,300	4,000	66,000	20,700
2,350	4,000	66,000	21,200
2,380	4,000	66,000	21,500
2,400	4,000	66,000	21,600
2,450	4,000	66,000	22,100
2,500	4,000	66,000	22,500
2,550	4,000	66,000	23,000
2,600	4,000	71,000	23,400
2,650	4,000	71,000	23,900
2,700	4,000	71,000	24,300
2,750	4,000	71,000	24,800
2,780	4,000	71,000	25,100
2,800	4,000	71,000	25,200
2,850	4,000	71,000	25,700
2,900	4,000	71,000	26,100
2,950	4,000	71,000	26,600
3,000	4,000	71,000	27,000

SuperV-Bohrer

SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung



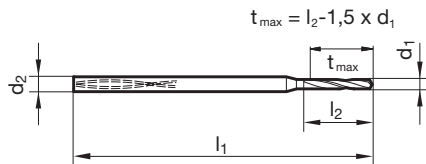
Katalog-Nr. 51973



P	M	K	N	S	H
○	●		○	●	

 Arbeitsrichtwerte
Seite 252

- Flächenanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm
1,000	3,000	48,000	13,000
1,050	3,000	48,000	13,700
1,100	3,000	48,000	14,300
1,150	3,000	48,000	15,000
1,190	3,000	48,000	15,500
1,200	3,000	51,000	15,600
1,250	3,000	51,000	16,300
1,300	3,000	51,000	16,900
1,350	3,000	51,000	17,600
1,400	4,000	56,000	18,200
1,450	4,000	56,000	18,900
1,500	4,000	56,000	19,500
1,550	4,000	56,000	20,200
1,590	4,000	56,000	20,700
1,600	4,000	56,000	20,800
1,650	4,000	56,000	21,500
1,700	4,000	61,000	22,100
1,750	4,000	61,000	22,800
1,800	4,000	61,000	23,400
1,850	4,000	61,000	24,100
1,900	4,000	61,000	24,700
1,950	4,000	61,000	25,400
1,980	4,000	61,000	25,800
2,000	4,000	61,000	26,000

d1 mm	d2 mm	l1 mm	l2 mm
2,050	4,000	61,000	26,700
2,100	4,000	66,000	27,300
2,150	4,000	66,000	28,000
2,200	4,000	66,000	28,600
2,250	4,000	66,000	29,300
2,300	4,000	66,000	29,900
2,350	4,000	66,000	30,600
2,380	4,000	66,000	31,000
2,400	4,000	66,000	31,200
2,450	4,000	66,000	31,900
2,500	4,000	66,000	32,500
2,550	4,000	66,000	33,200
2,600	4,000	71,000	33,800
2,650	4,000	71,000	34,500
2,700	4,000	71,000	35,100
2,750	4,000	71,000	35,800
2,780	4,000	71,000	36,200
2,800	4,000	71,000	36,400
2,850	4,000	71,000	37,100
2,900	4,000	71,000	37,700
2,950	4,000	71,000	38,400
3,000	4,000	71,000	39,000

SuperV-Bohrer

SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung



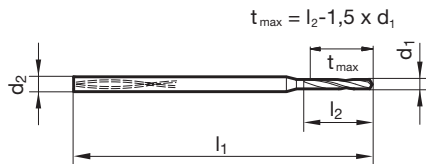
Katalog-Nr. 51974



P	M	K	N	S	H
○	●		○	●	

Arbeitsrichtwerte
Seite 252

- Ausspitzung $\geq \varnothing 1,000$
- Flächenanschliff
- Hauptschneidenform leicht konkav
- optimierte Schneidengeometrie



d1 mm	d2 mm	l1 mm	l2 mm
1,000	3,000	54,000	18,000
1,050	3,000	54,000	18,900
1,100	3,000	54,000	19,800
1,150	3,000	54,000	20,700
1,190	3,000	54,000	21,500
1,200	3,000	58,000	21,600
1,250	3,000	58,000	22,500
1,300	3,000	58,000	23,400
1,350	3,000	58,000	24,300
1,400	4,000	64,000	25,200
1,450	4,000	64,000	26,100
1,500	4,000	64,000	27,000
1,550	4,000	64,000	27,900
1,590	4,000	64,000	28,700
1,600	4,000	64,000	28,800
1,650	4,000	64,000	29,700
1,700	4,000	71,000	30,600
1,750	4,000	71,000	31,500
1,800	4,000	71,000	32,400
1,850	4,000	71,000	33,300
1,900	4,000	71,000	34,200
1,950	4,000	71,000	35,100
1,980	4,000	71,000	35,700
2,000	4,000	71,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm
2,050	4,000	71,000	36,900
2,100	4,000	79,000	37,800
2,150	4,000	79,000	38,700
2,200	4,000	79,000	39,600
2,250	4,000	79,000	40,500
2,300	4,000	79,000	41,400
2,350	4,000	79,000	42,300
2,380	4,000	79,000	42,900
2,400	4,000	79,000	43,200
2,450	4,000	79,000	44,100
2,500	4,000	79,000	45,000
2,550	4,000	79,000	45,900
2,600	4,000	87,000	46,800
2,650	4,000	87,000	47,700
2,700	4,000	87,000	48,600
2,750	4,000	87,000	49,500
2,780	4,000	87,000	50,100
2,800	4,000	87,000	50,400
2,850	4,000	87,000	51,300
2,900	4,000	87,000	52,200
2,950	4,000	87,000	53,100
3,000	4,000	87,000	54,000

Hartmetall-Spiralbohrer

Spiralbohrer kurz



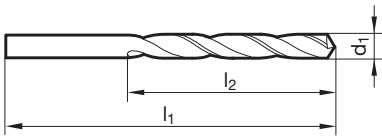
Katalog-Nr. 51290



P	M	K	N	S	H
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 Arbeitsrichtwerte
Seite 254

- Flächenanschliff
- Hauptschneidenform gerade
- höhere Verschleißfestigkeit



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000
5,200		86,000	52,000	10,000		133,000	87,000
5,300		86,000	52,000	10,500		133,000	87,000
5,400		93,000	57,000	11,000		142,000	94,000
5,500		93,000	57,000	11,500		142,000	94,000
5,600		93,000	57,000	12,000		151,000	101,000
5,700		93,000	57,000				

Spiralbohrer mit Zylinderschaft

Spiralbohrer mit verstärktem Zylinderschaft



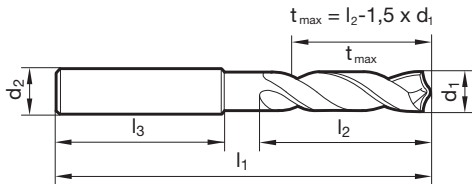
Katalog-Nr. 51146



P	M	K	N	S	H
○		○			●

Arbeitsrichtwerte
Seite 254

- Hauptschneidenform gerade (durch Korrektur)
- Flächenanschliff



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2,600	6,000	62,000	20,000	36,000
3,000	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
4,000	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,900	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,600	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,400	12,000	102,000	55,000	45,000
10,600	12,000	102,000	55,000	45,000
11,100	12,000	102,000	55,000	45,000
12,000	12,000	102,000	55,000	45,000
14,100	16,000	115,000	65,000	48,000

Einlippenbohrer

Einlippenbohrer SuperT-NXL



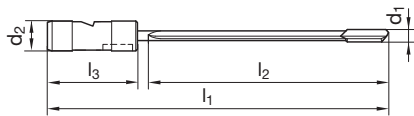
Katalog-Nr. 65030



P	M	K	N	S	H
●	○	●	○	○	○

 Arbeitsrichtwerte
Seite 256

- nur auf Tiefbohrmaschinen verwendbar
- universell einsetzbar
- Umfangsform G
- fixe Gesamtlänge 800 mm
- blanke Spanfläche für bessere Spanbildung



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Code-Nr.
3,000	25,000	800,000	700,000	70,000	3,000
4,000	25,000	800,000	700,000	70,000	4,000
5,000	25,000	800,000	700,000	70,000	5,000
6,000	25,000	800,000	700,000	70,000	6,000
7,000	25,000	800,000	700,000	70,000	7,000
8,000	25,000	800,000	700,000	70,000	8,000
9,000	25,000	800,000	700,000	70,000	9,000
10,000	25,000	800,000	700,000	70,000	10,000
11,000	25,000	800,000	700,000	70,000	11,000
11,500	25,000	800,000	700,000	70,000	11,500
12,000	25,000	800,000	700,000	70,000	12,000
13,000	25,000	800,000	700,000	70,000	13,000
14,000	25,000	800,000	700,000	70,000	14,000
15,000	25,000	800,000	700,000	70,000	15,000
16,000	25,000	800,000	700,000	70,000	16,000
17,000	25,000	800,000	700,000	70,000	17,000
18,000	25,000	800,000	700,000	70,000	18,000
19,000	25,000	800,000	700,000	70,000	19,000
20,000	25,000	800,000	700,000	70,000	20,000
21,000	25,000	800,000	700,000	70,000	21,000
22,000	25,000	800,000	700,000	70,000	22,000
23,000	25,000	800,000	700,000	70,000	23,000
24,000	25,000	800,000	700,000	70,000	24,000
25,000	25,000	800,000	700,000	70,000	25,000

Einlippenbohrer

Einlippenbohrer SuperT-NXL



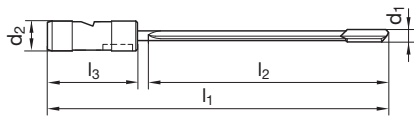
Katalog-Nr. 65031



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 256

- nur auf Tiefbohrmaschinen verwendbar
- universell einsetzbar
- Umfangsform G
- fixe Gesamtlänge 1200 mm
- blanke Spanfläche für bessere Spanbildung



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Code-Nr.
3,000	25,000	1200,000	1100,000	70,000	3,000
4,000	25,000	1200,000	1100,000	70,000	4,000
5,000	25,000	1200,000	1100,000	70,000	5,000
6,000	25,000	1200,000	1100,000	70,000	6,000
7,000	25,000	1200,000	1100,000	70,000	7,000
8,000	25,000	1200,000	1100,000	70,000	8,000
9,000	25,000	1200,000	1100,000	70,000	9,000
10,000	25,000	1200,000	1100,000	70,000	10,000
11,000	25,000	1200,000	1100,000	70,000	11,000
11,500	25,000	1200,000	1100,000	70,000	11,500
12,000	25,000	1200,000	1100,000	70,000	12,000
13,000	25,000	1200,000	1100,000	70,000	13,000
14,000	25,000	1200,000	1100,000	70,000	14,000
15,000	25,000	1200,000	1100,000	70,000	15,000
16,000	25,000	1200,000	1100,000	70,000	16,000
17,000	25,000	1200,000	1100,000	70,000	17,000
18,000	25,000	1200,000	1100,000	70,000	18,000
19,000	25,000	1200,000	1100,000	70,000	19,000
20,000	25,000	1200,000	1100,000	70,000	20,000
21,000	25,000	1200,000	1100,000	70,000	21,000
22,000	25,000	1200,000	1100,000	70,000	22,000
23,000	25,000	1200,000	1100,000	70,000	23,000
24,000	25,000	1200,000	1100,000	70,000	24,000
25,000	25,000	1200,000	1100,000	70,000	25,000

Einlippenbohrer

Einlippenbohrer SuperT-NXL



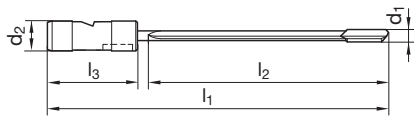
Katalog-Nr. 65032



P	M	K	N	S	H
●	○	●	○	○	○

 Arbeitsrichtwerte
Seite 256

- nur auf Tiefbohrmaschinen verwendbar
- universell einsetzbar
- Umfangsform G
- fixe Gesamtlänge 1600 mm
- blanke Spanfläche für bessere Spanbildung



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Code-Nr.
4,000	25,000	1600,000	1500,000	70,000	4,000
5,000	25,000	1600,000	1500,000	70,000	5,000
5,500	25,000	1600,000	1500,000	70,000	5,500
6,000	25,000	1600,000	1500,000	70,000	6,000
6,500	25,000	1600,000	1500,000	70,000	6,500
7,000	25,000	1600,000	1500,000	70,000	7,000
7,500	25,000	1600,000	1500,000	70,000	7,500
8,000	25,000	1600,000	1500,000	70,000	8,000
9,000	25,000	1600,000	1500,000	70,000	9,000
9,500	25,000	1600,000	1500,000	70,000	9,500
10,000	25,000	1600,000	1500,000	70,000	10,000
11,000	25,000	1600,000	1500,000	70,000	11,000
11,500	25,000	1600,000	1500,000	70,000	11,500
12,000	25,000	1600,000	1500,000	70,000	12,000
13,000	25,000	1600,000	1500,000	70,000	13,000
14,000	25,000	1600,000	1500,000	70,000	14,000
15,000	25,000	1600,000	1500,000	70,000	15,000
16,000	25,000	1600,000	1500,000	70,000	16,000
17,000	25,000	1600,000	1500,000	70,000	17,000
18,000	25,000	1600,000	1500,000	70,000	18,000
19,000	25,000	1600,000	1500,000	70,000	19,000
20,000	25,000	1600,000	1500,000	70,000	20,000
21,000	25,000	1600,000	1500,000	70,000	21,000
22,000	25,000	1600,000	1500,000	70,000	22,000
23,000	25,000	1600,000	1500,000	70,000	23,000
24,000	25,000	1600,000	1500,000	70,000	24,000
25,000	25,000	1600,000	1500,000	70,000	25,000

Einlippenbohrer

Einlippenbohrer SuperT-NXL



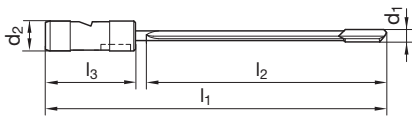
Katalog-Nr. 65033



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 256

- nur auf Tiefbohrmaschinen verwendbar
- universell einsetzbar
- Umfangsform G
- fixe Gesamtlänge 2000 mm
- blanke Spanfläche für bessere Spanbildung



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Code-Nr.
4,000	25,000	2000,000	1900,000	70,000	4,000
5,000	25,000	2000,000	1900,000	70,000	5,000
6,000	25,000	2000,000	1900,000	70,000	6,000
7,000	25,000	2000,000	1900,000	70,000	7,000
8,000	25,000	2000,000	1900,000	70,000	8,000
9,000	25,000	2000,000	1900,000	70,000	9,000
10,000	25,000	2000,000	1900,000	70,000	10,000
11,000	25,000	2000,000	1900,000	70,000	11,000
11,500	25,000	2000,000	1900,000	70,000	11,500
12,000	25,000	2000,000	1900,000	70,000	12,000
13,000	25,000	2000,000	1900,000	70,000	13,000
14,000	25,000	2000,000	1900,000	70,000	14,000
15,000	25,000	2000,000	1900,000	70,000	15,000
16,000	25,000	2000,000	1900,000	70,000	16,000
17,000	25,000	2000,000	1900,000	70,000	17,000
18,000	25,000	2000,000	1900,000	70,000	18,000
19,000	25,000	2000,000	1900,000	70,000	19,000
20,000	25,000	2000,000	1900,000	70,000	20,000
21,000	25,000	2000,000	1900,000	70,000	21,000
22,000	25,000	2000,000	1900,000	70,000	22,000
23,000	25,000	2000,000	1900,000	70,000	23,000
24,000	25,000	2000,000	1900,000	70,000	24,000
25,000	25,000	2000,000	1900,000	70,000	25,000
26,000	25,000	2000,000	1895,000	75,000	26,000
27,000	25,000	2000,000	1895,000	75,000	27,000
28,000	25,000	2000,000	1895,000	75,000	28,000
29,000	25,000	2000,000	1895,000	75,000	29,000
30,000	25,000	2000,000	1895,000	75,000	30,000
31,000	25,000	2000,000	1895,000	75,000	31,000
32,000	25,000	2000,000	1895,000	75,000	32,000

Spiralbohrer mit Zylinderschaft

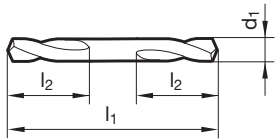
Karosseriebohrer



Katalog-Nr. 71660

N	WN	HSS	dampfbehandelt	118°	h8	R
P	M	K	N	S	H	
●	○	●	●	○		

- Kegelmantelschliff
- für beidseitigen Einsatz
- in Handbohrmaschinen im Karosseriebau



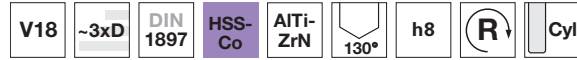
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
2,000	38,000	7,500	4,900	62,000	17,000
2,100	38,000	7,500	5,000	62,000	17,000
2,200	40,000	8,500	5,100	62,000	17,000
2,300	40,000	8,500	5,200	62,000	17,000
2,400	43,000	9,500	5,300	62,000	17,000
2,500	43,000	9,500	5,500	66,000	19,000
2,600	43,000	9,500	5,600	66,000	19,000
2,700	46,000	10,600	5,800	66,000	19,000
2,800	46,000	10,600	6,000	66,000	19,000
2,900	46,000	10,600	6,100	70,000	21,200
3,000	46,000	10,600	6,500	70,000	21,200
3,100	49,000	11,200	7,000	74,000	23,600
3,170	49,000	11,200	8,000	79,000	25,000
3,200	49,000	11,200	8,500	79,000	25,000
3,300	49,000	11,200	10,000	89,000	25,000
3,500	52,000	12,500			
3,600	52,000	12,500			
3,700	52,000	12,500			
3,800	55,000	14,000			
4,000	55,000	14,000			
4,100	55,000	14,000			
4,200	55,000	14,000			
4,500	58,000	15,500			
4,800	62,000	17,000			

Spiralbohrer mit Zylinderschaft

Spiralbohrer extra kurz

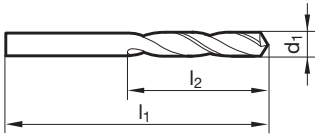


Katalog-Nr. 61131



P	M	K	N	S	H	Arbeitsrichtwerte Seite 254
○	●	○	○	●		

- Ausspitzung $\geq \varnothing 1,000$
- Kegelmantelschliff
- weite Spannuten
- besonders hohe Verschleißfestigkeit
- besonders hohe Stabilität



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	5,800		66,000	28,000
1,100		28,000	7,000	5,900		66,000	28,000
1,200		30,000	8,000	6,000		66,000	28,000
1,300		30,000	8,000	6,100		70,000	31,000
1,400		32,000	9,000	6,200		70,000	31,000
1,500		32,000	9,000	6,300		70,000	31,000
1,600		34,000	10,000	6,400		70,000	31,000
1,700		34,000	10,000	6,500		70,000	31,000
1,800		36,000	11,000	6,600		70,000	31,000
1,900		36,000	11,000	6,700		70,000	31,000
2,000		38,000	12,000	6,800		74,000	34,000
2,100		38,000	12,000	6,900		74,000	34,000
2,200		40,000	13,000	7,000		74,000	34,000
2,300		40,000	13,000	7,100		74,000	34,000
2,400		43,000	14,000	7,200		74,000	34,000
2,500		43,000	14,000	7,300		74,000	34,000
2,600		43,000	14,000	7,400		74,000	34,000
2,700		46,000	16,000	7,500		74,000	34,000
2,800		46,000	16,000	7,600		79,000	37,000
2,900		46,000	16,000	7,700		79,000	37,000
3,000		46,000	16,000	7,800		79,000	37,000
3,100		49,000	18,000	7,900		79,000	37,000
3,200		49,000	18,000	8,000		79,000	37,000
3,300		49,000	18,000	8,100		79,000	37,000
3,400		52,000	20,000	8,200		79,000	37,000
3,500		52,000	20,000	8,300		79,000	37,000
3,600		52,000	20,000	8,400		79,000	37,000
3,700		52,000	20,000	8,500		79,000	37,000
3,800		55,000	22,000	8,600		84,000	40,000
3,900		55,000	22,000	8,700		84,000	40,000
4,000		55,000	22,000	8,800		84,000	40,000
4,100		55,000	22,000	8,900		84,000	40,000
4,200		55,000	22,000	9,000		84,000	40,000
4,300		58,000	24,000	9,100		84,000	40,000
4,400		58,000	24,000	9,200		84,000	40,000
4,500		58,000	24,000	9,300		84,000	40,000
4,600		58,000	24,000	9,400		84,000	40,000
4,700		58,000	24,000	9,500		84,000	40,000
4,800		62,000	26,000	9,600		89,000	43,000
4,900		62,000	26,000	9,700		89,000	43,000
5,000		62,000	26,000	9,800		89,000	43,000
5,100		62,000	26,000	9,900		89,000	43,000
5,200		62,000	26,000	10,000		89,000	43,000
5,300		62,000	26,000	10,200		89,000	43,000
5,400		66,000	28,000	10,500		89,000	43,000
5,500		66,000	28,000	11,000		95,000	47,000
5,600		66,000	28,000	11,200		95,000	47,000
5,700		66,000	28,000	11,500		95,000	47,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,800		95,000	47,000				
12,000		102,000	51,000				
12,500		102,000	51,000				
13,000		102,000	51,000				

Spiralbohrer mit Zylinderschaft

Spiralbohrer kurz



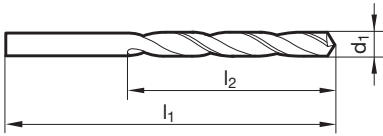
Katalog-Nr. 61232



P	M	K	N	S	H
○	●	○	○	●	

Arbeitsrichtwerte
Seite 254

- Ausspitzung $\geq \varnothing 1,000$
- Kegelmantelanschliff
- weite Spannuten
- besonders hohe Stabilität
- besonders hohe Verschleißfestigkeit



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000
5,200		86,000	52,000	10,000		133,000	87,000
5,300		86,000	52,000	10,200		133,000	87,000
5,400		93,000	57,000	10,500		133,000	87,000
5,500		93,000	57,000	11,000		142,000	94,000
5,600		93,000	57,000	11,200		142,000	94,000
5,700		93,000	57,000	11,500		142,000	94,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,800		142,000	94,000				
12,000		151,000	101,000				
12,500		151,000	101,000				
13,000		151,000	101,000				

Spiralbohrer mit Zylinderschaft

V16-Spiralbohrer

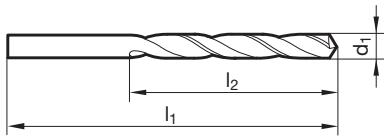


Katalog-Nr. 71018



P	M	K	N	S	H	Arbeitsrichtwerte Seite 254
●	●	●	●	●	○	

- Ausspitzung $\geq \varnothing 1,000$
- optimierter Kreuzanschliff
- 8%-kobaltlegierter HSCO-Schnellarbeitsstahl für längere Werkzeuglebensdauer, höhere Warmhärte und Wärmefestigkeit
- für stationären und mobilen Einsatz



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	4,900		86,000	52,000
1,100		36,000	14,000	5,000		86,000	52,000
1,200		38,000	16,000	5,100		86,000	52,000
1,300		38,000	16,000	5,160	13/64	86,000	52,000
1,400		40,000	18,000	5,200		86,000	52,000
1,500		40,000	18,000	5,300		86,000	52,000
1,590	1/16	43,000	20,000	5,400		93,000	57,000
1,600		43,000	20,000	5,500		93,000	57,000
1,700		43,000	20,000	5,560	7/32	93,000	57,000
1,800		46,000	22,000	5,600		93,000	57,000
1,900		46,000	22,000	5,700		93,000	57,000
1,980	5/64	49,000	24,000	5,800		93,000	57,000
2,000		49,000	24,000	5,900		93,000	57,000
2,100		49,000	24,000	5,950	15/64	93,000	57,000
2,200		53,000	27,000	6,000		93,000	57,000
2,300		53,000	27,000	6,100		101,000	63,000
2,380	3/32	57,000	30,000	6,200		101,000	63,000
2,400		57,000	30,000	6,300		101,000	63,000
2,500		57,000	30,000	6,350	1/4	101,000	63,000
2,600		57,000	30,000	6,400		101,000	63,000
2,700		61,000	33,000	6,500		101,000	63,000
2,780	7/64	61,000	33,000	6,600		101,000	63,000
2,800		61,000	33,000	6,700		101,000	63,000
2,900		61,000	33,000	6,800		109,000	69,000
3,000		61,000	33,000	6,900		109,000	69,000
3,100		65,000	36,000	7,000		109,000	69,000
3,170	1/8	65,000	36,000	7,100		109,000	69,000
3,200		65,000	36,000	7,140	9/32	109,000	69,000
3,250		65,000	36,000	7,200		109,000	69,000
3,300		65,000	36,000	7,300		109,000	69,000
3,400		70,000	39,000	7,400		109,000	69,000
3,500		70,000	39,000	7,500		109,000	69,000
3,570	9/64	70,000	39,000	7,540	19/64	117,000	75,000
3,600		70,000	39,000	7,600		117,000	75,000
3,700		70,000	39,000	7,700		117,000	75,000
3,800		75,000	43,000	7,800		117,000	75,000
3,900		75,000	43,000	7,900		117,000	75,000
3,970	5/32	75,000	43,000	7,940	5/16	117,000	75,000
4,000		75,000	43,000	8,000		117,000	75,000
4,100		75,000	43,000	8,100		117,000	75,000
4,200		75,000	43,000	8,200		117,000	75,000
4,300		80,000	47,000	8,300		117,000	75,000
4,400		80,000	47,000	8,330	21/64	117,000	75,000
4,500		80,000	47,000	8,400		117,000	75,000
4,600		80,000	47,000	8,500		117,000	75,000
4,700		80,000	47,000	8,600		125,000	81,000
4,760	3/16	86,000	52,000	8,700		125,000	81,000
4,800		86,000	52,000	8,730	11/32	125,000	81,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
8,800		125,000	81,000	10,320	13/32	133,000	87,000
8,900		125,000	81,000	10,500		133,000	87,000
9,000		125,000	81,000	10,720	27/64	142,000	94,000
9,100		125,000	81,000	10,800		142,000	94,000
9,130	23/64	125,000	81,000	11,000		142,000	94,000
9,200		125,000	81,000	11,110	7/16	142,000	94,000
9,300		125,000	81,000	11,500		142,000	94,000
9,500		125,000	81,000	11,510	29/64	142,000	94,000
9,520	3/8	133,000	87,000	11,910	15/32	151,000	101,000
9,600		133,000	87,000	12,000		151,000	101,000
9,700		133,000	87,000	12,200		151,000	101,000
9,800		133,000	87,000	12,300	31/64	151,000	101,000
9,900		133,000	87,000	12,500		151,000	101,000
9,920	25/64	133,000	87,000	12,700	1/2	151,000	101,000
10,000		133,000	87,000	12,800		151,000	101,000
10,100		133,000	87,000	13,000		151,000	101,000
10,200		133,000	87,000				
10,300		133,000	87,000				

Spiralbohrer mit Zylinderschaft

V16-Spiralbohrer-Sätze



V16	~5xD	DIN 338	M42	Bronze-VAP	135°	h8	R	Cyl	Arbeitsrichtwerte Seite 254		
P	M	K	N	S	H	•	•	•		•	•

- optimierter Kreuzanschliff
- 8%-kobaltlegierter HSCO-Schnellarbeitsstahl
- für stationären und mobilen Einsatz
- Für Monteure und Handwerker stehen Sätze mit den gebräuchlichsten Bohrerabmessungen zur Verfügung.

Katalog-Nr. 71019

Code-Nr.	d1 mm	steigend um mm	Stück/Satz
0,013	1,0-10,0	0,5	19
0,014	1,0-13,0	0,5	25

Maschinen-Gewindebohrer**V16-Pocket-Satz (Spiralbohrer, Gewindebohrer und Senker)**

- bestehend aus Gewindebohrer Katalog-Nr. 73046 (M3 / M4 / M5 / M6 / M8 / M10), Spiralbohrer Katalog-Nr. 71018 (Ø 2,5 / 3,3 / 4,2 / 5,0 / 6,8 / 8,5) und Kegelsenker 90° Katalog-Nr. 72346 (Ø 6,3 / 12,4)

Katalog-Nr. 71020

Code-Nr.	Stück/Satz
1,000	14

Spiralbohrer mit Zylinderschaft

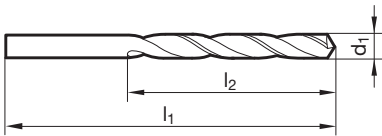
Stangenbohrer, Länge 6 inches



Katalog-Nr. 71140

N	NAS 907	HSS	blank	118°	h8	R	Cyl
P	M	K	N	S	H		
•		•	•				

- Kegelmantelschliff
- Bleche aus Al-Legierungen
- geschichtete Platten (Sandwich-Pakete)
- Stahl und Guss



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		153,000	23,000	4,000		154,000	55,000
1,590	1/16	153,000	26,000	4,040		154,000	55,000
1,610		153,000	26,000	4,090		154,000	55,000
1,650		153,000	26,000	4,220		154,000	55,000
1,750		153,000	26,000	4,300		154,000	60,000
1,780		153,000	26,000	4,370	11/64	154,000	60,000
1,850		153,000	26,000	4,390		154,000	60,000
1,900		153,000	26,000	4,500		154,000	60,000
1,930		153,000	29,000	4,570		154,000	60,000
1,980	5/64	153,000	29,000	4,700		154,000	60,000
1,990		153,000	29,000	4,760	3/16	154,000	63,500
2,000		153,000	29,000	4,800		154,000	63,500
2,080		153,000	29,000	4,850		154,000	63,500
2,100		153,000	29,000	4,920		154,000	63,500
2,180		153,000	32,500	4,980		154,000	63,500
2,260		153,000	32,500	5,000		154,000	63,500
2,300		153,000	32,500	5,110		154,000	63,500
2,370		153,000	37,000	5,160	13/64	154,000	63,500
2,380	3/32	153,000	37,000	5,500		154,000	68,500
2,400		153,000	37,000	5,560	7/32	154,000	68,500
2,490		153,000	37,000	5,610		154,000	68,500
2,500		153,000	37,000	5,790		154,000	68,500
2,530		153,000	37,000	5,800		154,000	68,500
2,580		153,000	37,000	5,940		154,000	68,500
2,640		153,000	37,000	5,950	15/64	154,000	68,500
2,710		153,000	42,000	6,040		154,000	75,000
2,780	7/64	153,000	42,000	6,150		154,000	75,000
2,790		153,000	42,000	6,200		154,000	75,000
2,820		153,000	42,000	6,250		154,000	75,000
2,870		153,000	42,000	6,350	1/4	154,000	75,000
2,950		153,000	42,000	6,400		154,000	75,000
3,000		153,000	42,000	6,530		154,000	75,000
3,050		153,000	42,000	6,630		154,000	75,000
3,170	1/8	153,000	42,000	6,750	17/64	155,000	80,000
3,200		153,000	42,000	6,800		155,000	80,000
3,260		153,000	42,000	7,000		155,000	80,000
3,450		154,000	49,000	7,500		155,000	80,000
3,500		154,000	49,000	7,700		155,000	90,000
3,570	9/64	154,000	49,000	7,940	5/16	155,000	90,000
3,600		154,000	49,000	8,000		155,000	90,000
3,660		154,000	49,000	8,500		155,000	90,000
3,700		154,000	49,000				
3,730		154,000	49,000				
3,800		154,000	55,000				
3,860		154,000	55,000				
3,910		154,000	55,000				
3,970	5/32	154,000	55,000				
3,990		154,000	55,000				

Spiralbohrer mit Zylinderschaft

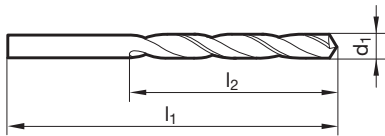
Stangenbohrer, Länge 6 inches



Katalog-Nr. 71142

N	NAS 907	HSS	ni- triert	135°	h8	R	Cyl
P	M	K	N	S	H		
•		•	•				

- Kegelmantelschliff
- Bleche aus Al-Legierungen
- geschichtete Platten (Sandwich-Pakete)
- Stahl und Guss



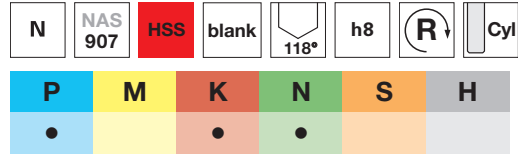
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		153,000	23,000	4,390		154,000	60,000
1,590	1/16	153,000	26,000	4,500		154,000	60,000
1,700		153,000	26,000	4,570		154,000	60,000
1,750		153,000	26,000	4,620		154,000	60,000
1,780		153,000	26,000	4,700		154,000	60,000
1,900		153,000	26,000	4,760	3/16	154,000	63,500
1,980	5/64	153,000	29,000	4,800		154,000	63,500
2,000		153,000	29,000	4,850		154,000	63,500
2,300		153,000	32,500	4,920		154,000	63,500
2,380	3/32	153,000	37,000	4,980		154,000	63,500
2,400		153,000	37,000	5,000		154,000	63,500
2,490		153,000	37,000	5,060		154,000	63,500
2,500		153,000	37,000	5,110		154,000	63,500
2,530		153,000	37,000	5,160	13/64	154,000	63,500
2,580		153,000	37,000	5,410		154,000	68,500
2,640		153,000	37,000	5,500		154,000	68,500
2,710		153,000	42,000	5,560	7/32	154,000	68,500
2,780	7/64	153,000	42,000	5,610		154,000	68,500
2,790		153,000	42,000	5,790		154,000	68,500
2,820		153,000	42,000	5,800		154,000	68,500
2,870		153,000	42,000	5,940		154,000	68,500
2,950		153,000	42,000	5,950	15/64	154,000	68,500
3,000		153,000	42,000	6,040		154,000	75,000
3,050		153,000	42,000	6,150		154,000	75,000
3,170	1/8	153,000	42,000	6,200		154,000	75,000
3,200		153,000	42,000	6,250		154,000	75,000
3,260		153,000	42,000	6,350	1/4	154,000	75,000
3,450		154,000	49,000	6,450		154,000	75,000
3,500		154,000	49,000	6,530		154,000	75,000
3,570	9/64	154,000	49,000	6,750	17/64	155,000	80,000
3,600		154,000	49,000	6,800		155,000	80,000
3,660		154,000	49,000	7,000		155,000	80,000
3,700		154,000	49,000	7,700		155,000	90,000
3,800		154,000	55,000	7,940	5/16	155,000	90,000
3,970	5/32	154,000	55,000	8,000		155,000	90,000
3,990		154,000	55,000				
4,000		154,000	55,000				
4,040		154,000	55,000				
4,090		154,000	55,000				
4,220		154,000	55,000				
4,300		154,000	60,000				
4,370	11/64	154,000	60,000				

Spiralbohrer mit Zylinderschaft

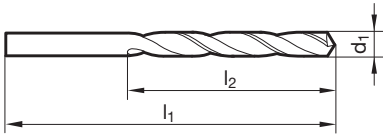
Stangenbohrer, Länge 12 inches



Katalog-Nr. 71141



- Kegelmantelschliff
- Bleche aus Al-Legierungen
- geschichtete Platten (Sandwich-Pakete)
- Stahl und Guss



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		306,000	23,000	4,300		308,000	60,000
1,590	1/16	306,000	26,000	4,370	11/64	308,000	60,000
1,780		306,000	26,000	4,390		308,000	60,000
1,850		306,000	26,000	4,500		308,000	60,000
1,900		306,000	26,000	4,570		308,000	60,000
1,930		306,000	29,000	4,620		308,000	60,000
1,980	5/64	306,000	29,000	4,700		308,000	60,000
1,990		306,000	29,000	4,760	3/16	308,000	63,500
2,000		306,000	29,000	4,800		308,000	63,500
2,060		306,000	29,000	4,850		308,000	63,500
2,080		306,000	29,000	4,920		308,000	63,500
2,100		306,000	29,000	4,980		308,000	63,500
2,180		306,000	32,500	5,000		308,000	63,500
2,260		306,000	32,500	5,160	13/64	308,000	63,500
2,380	3/32	306,000	37,000	5,220		308,000	63,500
2,440		306,000	37,000	5,410		308,000	68,500
2,490		306,000	37,000	5,500		308,000	68,500
2,500		306,000	37,000	5,560	7/32	308,000	68,500
2,530		306,000	37,000	5,790		308,000	68,500
2,580		306,000	37,000	5,800		308,000	68,500
2,640		306,000	37,000	5,950	15/64	308,000	68,500
2,780	7/64	306,000	42,000	6,000		308,000	68,500
2,790		306,000	42,000	6,040		308,000	75,000
2,820		306,000	42,000	6,150		308,000	75,000
2,950		306,000	42,000	6,200		308,000	75,000
3,000		306,000	42,000	6,250		308,000	75,000
3,050		306,000	42,000	6,350	1/4	308,000	75,000
3,170	1/8	306,000	42,000	6,530		308,000	75,000
3,200		306,000	42,000	7,000		310,000	80,000
3,260		306,000	42,000	7,700		310,000	90,000
3,450		308,000	49,000	7,940	5/16	310,000	90,000
3,500		308,000	49,000	8,000		310,000	90,000
3,570	9/64	308,000	49,000	8,500		310,000	90,000
3,600		308,000	49,000				
3,660		308,000	49,000				
3,700		308,000	49,000				
3,800		308,000	55,000				
3,970	5/32	308,000	55,000				
4,000		308,000	55,000				
4,040		308,000	55,000				
4,090		308,000	55,000				
4,220		308,000	55,000				

Spiralbohrer mit Zylinderschaft

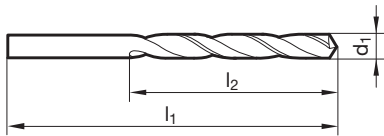
Stangenbohrer, Länge 12 inches



Katalog-Nr. 71143

N	NAS 907	HSS	ni- triert	135°	h8	R	Cyl
P	M	K	N	S	H		
•		•	•				

- Kegelmantelschliff
- Bleche aus Al-Legierungen
- geschichtete Platten (Sandwich-Pakete)
- Stahl und Guss



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		306,000	23,000	4,220		308,000	55,000
1,590	1/16	306,000	26,000	4,290		308,000	60,000
1,780		306,000	26,000	4,300		308,000	60,000
1,900		306,000	26,000	4,370	11/64	308,000	60,000
1,980	5/64	306,000	29,000	4,390		308,000	60,000
2,000		306,000	29,000	4,500		308,000	60,000
2,300		306,000	32,500	4,570		308,000	60,000
2,380	3/32	306,000	37,000	4,620		308,000	60,000
2,490		306,000	37,000	4,700		308,000	60,000
2,500		306,000	37,000	4,760	3/16	308,000	63,500
2,530		306,000	37,000	4,800		308,000	63,500
2,580		306,000	37,000	4,850		308,000	63,500
2,640		306,000	37,000	4,920		308,000	63,500
2,710		306,000	42,000	4,980		308,000	63,500
2,780	7/64	306,000	42,000	5,000		308,000	63,500
2,790		306,000	42,000	5,060		308,000	63,500
2,820		306,000	42,000	5,110		308,000	63,500
2,870		306,000	42,000	5,160	13/64	308,000	63,500
2,950		306,000	42,000	5,500		308,000	68,500
3,000		306,000	42,000	5,560	7/32	308,000	68,500
3,050		306,000	42,000	5,790		308,000	68,500
3,170	1/8	306,000	42,000	5,940		308,000	68,500
3,200		306,000	42,000	5,950	15/64	308,000	68,500
3,260		306,000	42,000	6,000		308,000	68,500
3,450		308,000	49,000	6,040		308,000	75,000
3,500		308,000	49,000	6,150		308,000	75,000
3,600		308,000	49,000	6,200		308,000	75,000
3,660		308,000	49,000	6,250		308,000	75,000
3,700		308,000	49,000	6,350	1/4	308,000	75,000
3,730		308,000	49,000	6,530		308,000	75,000
3,800		308,000	55,000	6,800		310,000	80,000
3,970	5/32	308,000	55,000	7,000		310,000	80,000
3,990		308,000	55,000	7,700		310,000	90,000
4,000		308,000	55,000	7,940	5/16	310,000	90,000
4,040		308,000	55,000	8,000		310,000	90,000
4,090		308,000	55,000				

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

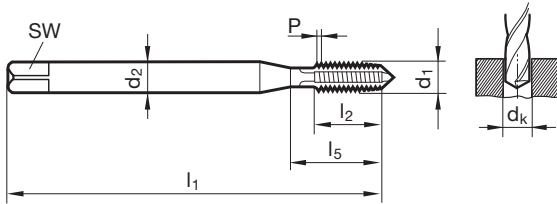


Katalog-Nr. 53733



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279



- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M4,5	0,750	6,000	4,900	3,70	70,000	14,000	25,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M9	1,250	9,000	7,000	7,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M11	1,500	8,000	6,200	9,50	100,000	20,000	42,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000
M42	4,500	32,000	24,000	37,50	200,000	56,000	112,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



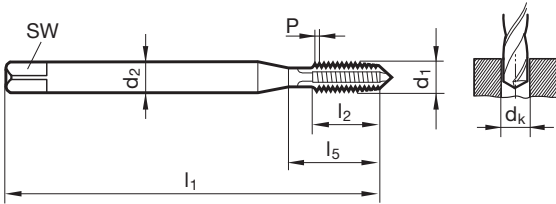
Katalog-Nr. 53734



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

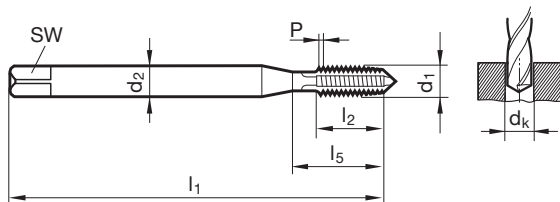


Katalog-Nr. 53735



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279



- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



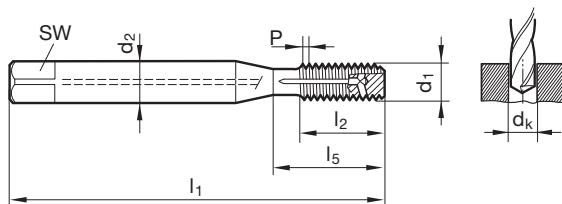
Katalog-Nr. 53736

Produktiv N-X	DIN 371/376	B	HSS-E-PM	AlTiZrN	R	6HX
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P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

Gewindewerkzeuge



- für Durchgangsgewinde
- mit Schälanschnitt
- radialer Kühlmittelaustritt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

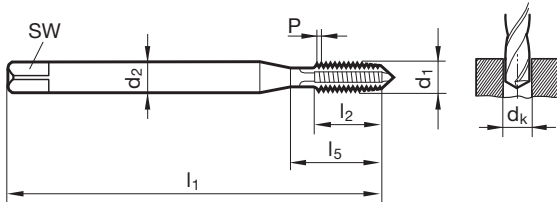


Katalog-Nr. 53737

Produktiv N-X	DIN 371/376	B	HSS-E	AlTiZrN	R	6H +0,1
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P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



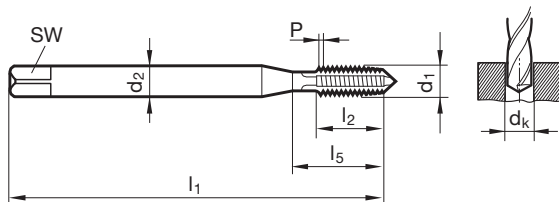
Katalog-Nr. 53738



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279

Gewindewerkzeuge



- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

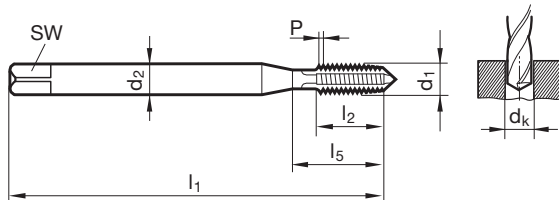


Katalog-Nr. 53739



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- überlang
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	90,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	125,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	140,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	160,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	180,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	200,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	220,000	24,000	158,000
M14	2,000	11,000	9,000	12,00	220,000	26,000	160,000
M16	2,000	12,000	9,000	14,00	220,000	26,000	160,000
M20	2,500	16,000	12,000	17,50	280,000	32,000	217,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



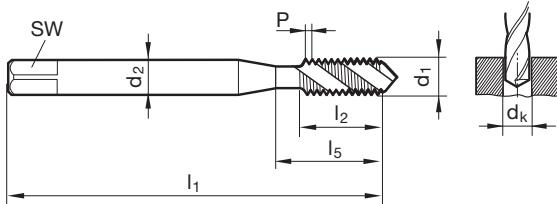
Katalog-Nr. 53746



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M4,5	0,750	6,000	4,900	3,70	70,000	8,500	25,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M9	1,250	9,000	7,000	7,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M11	1,500	8,000	6,200	9,50	100,000	16,000	42,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	40,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000
M42	4,500	32,000	24,000	37,50	200,000	45,000	112,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

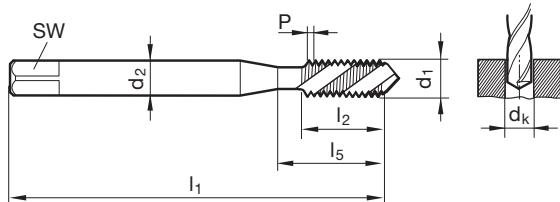


Katalog-Nr. 53747



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



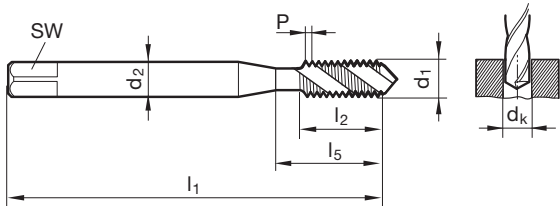
Katalog-Nr. 53748



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

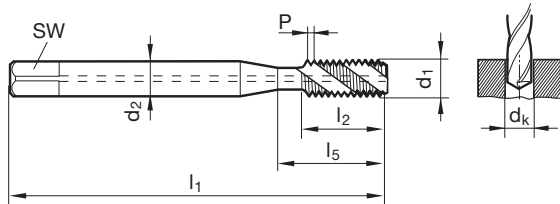


Katalog-Nr. 53749



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- mit axialem Kühlkanal
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

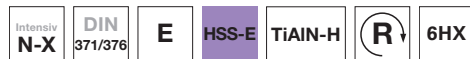
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



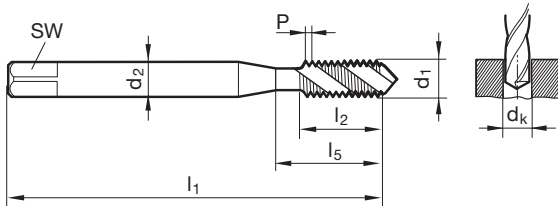
Katalog-Nr. 53760



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- kurzer Anschnitt für Gewindetiefen nahe Bohrungsgrund
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



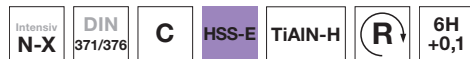
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

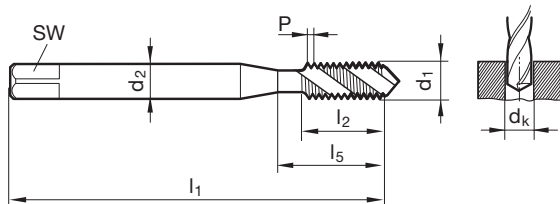


Katalog-Nr. 53750



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



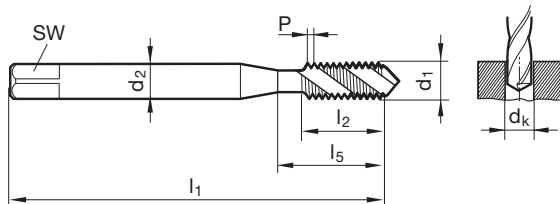
Katalog-Nr. 53751



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



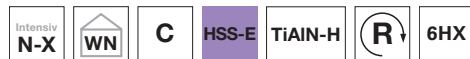
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

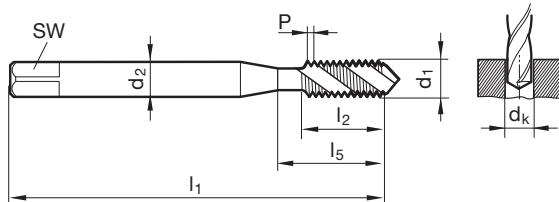


Katalog-Nr. 53752



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279



- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- überlang
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	90,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	125,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	140,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	160,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	180,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	200,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	220,000	18,500	158,000
M14	2,000	11,000	9,000	12,00	220,000	20,000	160,000
M16	2,000	12,000	9,000	14,00	220,000	20,000	160,000
M20	2,500	16,000	12,000	17,50	280,000	25,000	217,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



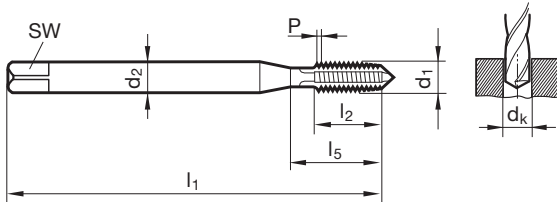
Katalog-Nr. 63033

Produktiv N	DIN 371/376	B	HSS-E	TiN	R	ISO2/6H
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P	M	K	N	S	H
●	○	○	○		

Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1100 N/mm²



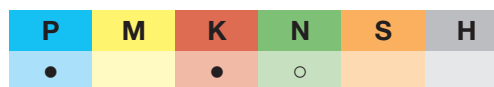
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

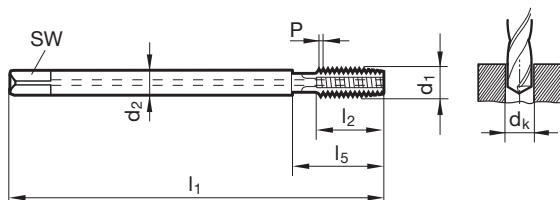


Katalog-Nr. 53646



Arbeitsrichtwerte
Seite 258-279

- für große Gewinde
- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- für Gusswerkstoffe
- für Al-Legierungen ab 7% Si-Gehalt
- mit axialem Kühlkanal



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000

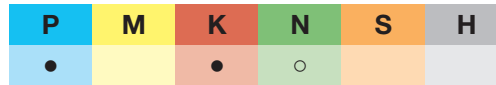
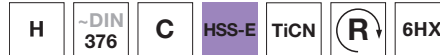
Gewindewerkzeuge

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

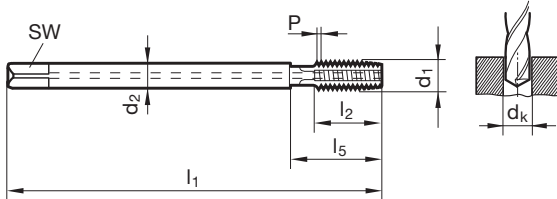


Katalog-Nr. 53647



Arbeitsrichtwerte
Seite 258-279

- für große Gewinde
- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- für Gusswerkstoffe
- für Al-Legierungen ab 7% Si-Gehalt
- mit axialem Kühlkanal
- für große Gewindetiefen



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	160,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	180,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	200,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	225,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	250,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	275,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	300,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	325,000	50,000	107,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



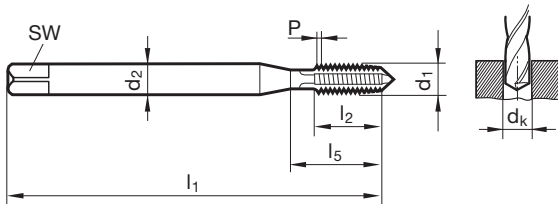
Katalog-Nr. 53642

Produktiv H	DIN 371/376	B	HSS-E	TiCN	R	ISO2/6H
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P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- hochfeste Werkstoffe



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



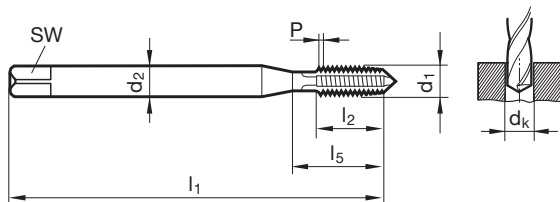
Katalog-Nr. 53640

Produktiv H	DIN 371/376	B	HSS-E- PM	TiCN	R	ISO2/6H
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P	M	K	N	S	H
●		○			

Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- hochfeste Werkstoffe



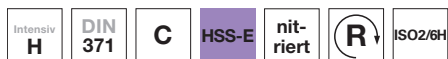
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



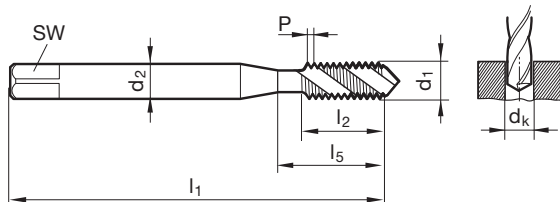
Katalog-Nr. 73661



P	M	K	N	S	H
●		○			

Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 40° Rechtsdrall
- Spanförderung in Schafrichtung
- hochfeste Werkstoffe



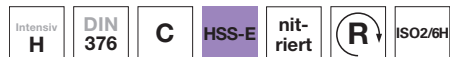
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

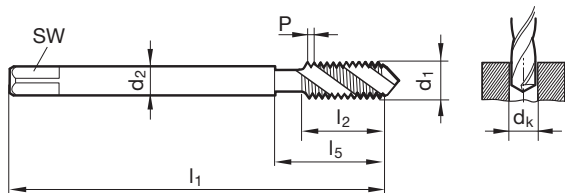


Katalog-Nr. 73664



Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 40° Rechtsdrall
- Spanförderung in Schafrichtung
- hochfeste Werkstoffe



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



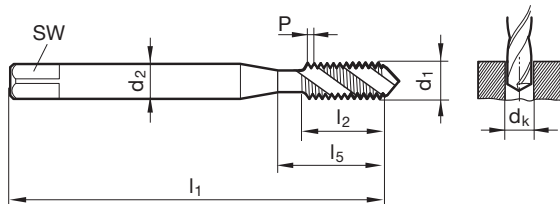
Katalog-Nr. 53661



P	M	K	N	S	H
●		○			

Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 40° Rechtsdrall
- Spanförderung in Schafrichtung
- hochfeste Werkstoffe



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde



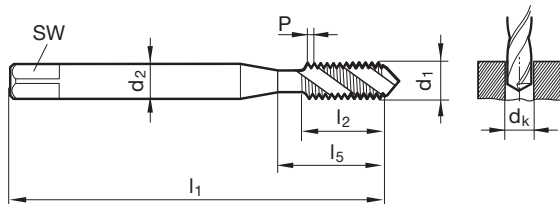
Katalog-Nr. 53664



P	M	K	N	S	H
≤ 1200		○			

Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 15° Rechtsdrall
- Spanförderung in Schafrichtung
- hochfeste Werkstoffe



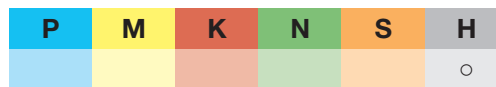
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Gewinde

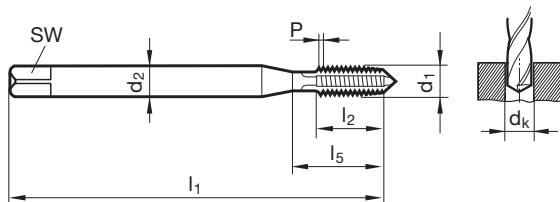


Katalog-Nr. 53676



Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- für Gewindetiefen bis 1,5xD
- für Materialien zwischen 45 - 55 HRC



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M3	0,500	3,500	2,700	2,60	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,40	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,30	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,10	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,90	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,60	100,000	20,000	39,000
M12	1,750	12,000	9,000	10,40	110,000	24,000	49,000
M14	2,000	14,000	11,000	12,10	110,000	26,000	53,000
M16	2,000	16,000	12,000	14,10	110,000	26,000	54,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



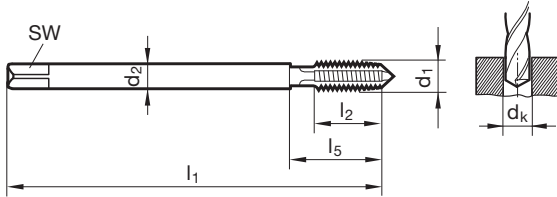
Katalog-Nr. 53778



P	M	K	N	S	H
●	●	○	○	○	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Gewindewerkzeuge

Code-Nr.	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
3,002	M3 x 0,35	2,200	1,800	2,65	56,000	7,000	18,000
4,002	M4 x 0,35	2,800	2,100	3,65	63,000	8,000	21,000
4,003	M4 x 0,5	2,800	2,100	3,50	63,000	8,000	21,000
5,003	M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000
6,003	M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000
6,004	M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	17,000	35,000
9,005	M9 x 1	7,000	5,500	8,00	90,000	16,000	35,000
10,004	M10 x 0,75	7,000	5,500	9,20	90,000	16,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000
11,005	M11 x 1	8,000	6,200	10,00	90,000	20,000	33,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,005	M14 x 1	11,000	9,000	13,00	100,000	20,000	40,000
14,006	M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,005	M16 x 1	12,000	9,000	15,00	100,000	22,000	44,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,005	M18 x 1	14,000	11,000	17,00	110,000	25,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000
18,008	M18 x 2	14,000	11,000	16,00	125,000	30,000	58,000
20,005	M20 x 1	16,000	12,000	19,00	125,000	25,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000
20,008	M20 x 2	16,000	12,000	18,00	140,000	32,000	60,000
22,005	M22 x 1	18,000	14,500	21,00	125,000	25,000	44,000
22,007	M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000
22,008	M22 x 2	18,000	14,500	20,00	140,000	32,000	62,000
24,005	M24 x 1	18,000	14,500	23,00	140,000	28,000	48,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000
24,008	M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



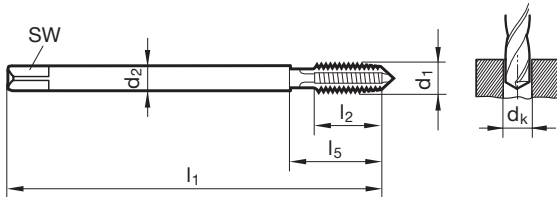
Katalog-Nr. 53789



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,00	90,000	17,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



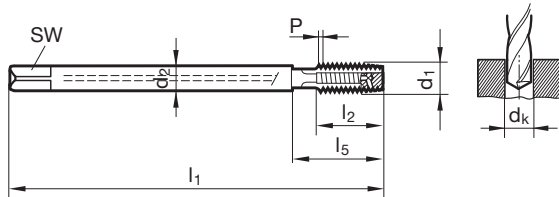
Katalog-Nr. 53790



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- radialer Kühlmittelaustritt
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,00	90,000	17,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



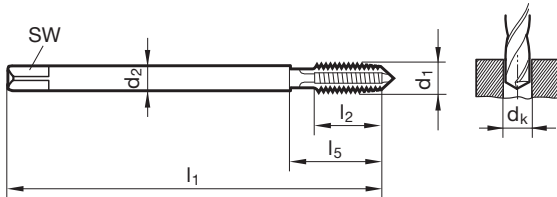
Katalog-Nr. 53779



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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
6,004	M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	17,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



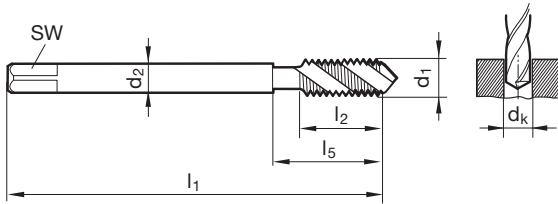
Katalog-Nr. 53780



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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Gewindewerkzeuge

Code-Nr.	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
3,002	M3 x 0,35	2,200	1,800	2,65	56,000	4,000	18,000
4,002	M4 x 0,35	2,800	2,100	3,65	63,000	5,000	21,000
4,003	M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000
5,003	M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000
6,003	M6 x 0,5	4,500	3,400	5,50	80,000	5,000	30,000
6,004	M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
9,005	M9 x 1	7,000	5,500	8,00	90,000	11,000	35,000
10,004	M10 x 0,75	7,000	5,500	9,20	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000
11,005	M11 x 1	8,000	6,200	10,00	90,000	11,000	33,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	15,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	15,000	40,000
14,005	M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000
14,006	M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,005	M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,005	M18 x 1	14,000	11,000	17,00	110,000	12,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
18,008	M18 x 2	14,000	11,000	16,00	125,000	20,000	58,000
20,005	M20 x 1	16,000	12,000	19,00	125,000	12,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
20,008	M20 x 2	16,000	12,000	18,00	140,000	20,000	60,000
22,005	M22 x 1	18,000	14,500	21,00	125,000	12,000	44,000
22,007	M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000
22,008	M22 x 2	18,000	14,500	20,00	140,000	22,000	62,000
24,005	M24 x 1	18,000	14,500	23,00	140,000	15,000	48,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000
24,008	M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



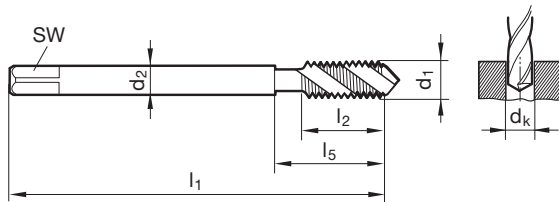
Katalog-Nr. 53791



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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



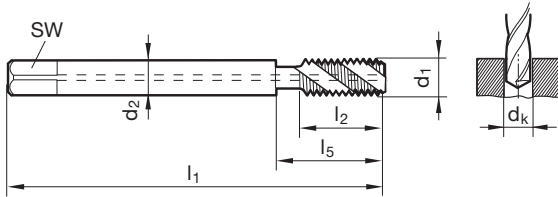
Katalog-Nr. 53792



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- mit axialem Kühlkanal
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Gewindewerkzeuge

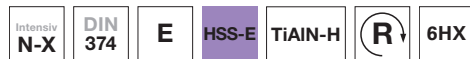
Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



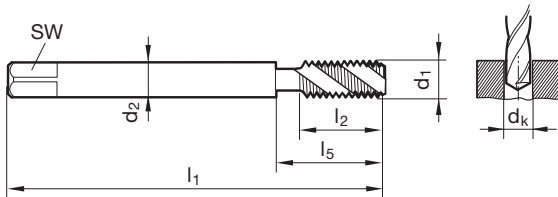
Katalog-Nr. 53770



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- kurzer Anschnitt für Gewindetiefen nahe Bohrungsgrund
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
6,004	M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde



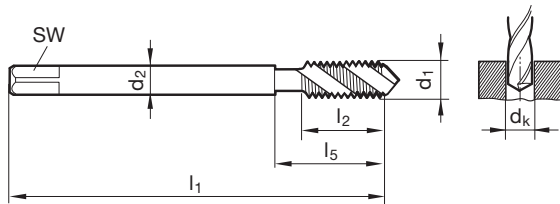
Katalog-Nr. 53781



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
6,004	M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für Metrische ISO-Feingewinde

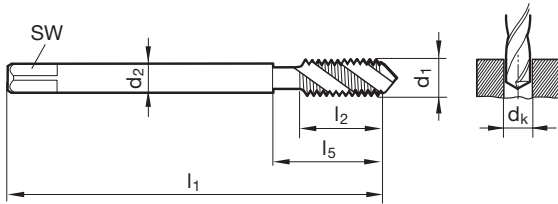


Katalog-Nr. 73647



Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- hochfeste Werkstoffe
- Stähle 1100 bis 1200 N/mm²



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,004	M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000
12,005	M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000
12,007	M12 x 1,5	9,000	7,000	10,50	100,000	15,000	40,000
14,007	M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000
22,007	M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000
24,007	M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschinen-Gewindebohrer

Gewindebohrer für UNC-Gewinde



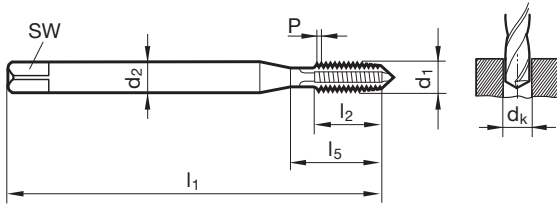
Katalog-Nr. 53782



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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



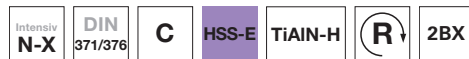
Code-Nr.	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
2,184	2 - 56	2,800	2,100	1,85	45,000	9,000	14,500
2,845	4 - 40	3,500	2,700	2,35	56,000	11,000	18,000
3,505	6 - 32	4,000	3,000	2,85	56,000	12,000	20,000
4,166	8 - 32	4,500	3,400	3,50	63,000	12,000	21,000
4,826	10 - 24	6,000	4,900	3,90	70,000	14,000	25,000
5,486	12 - 24	6,000	4,900	4,50	80,000	16,000	30,000
6,350	1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000
7,938	5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000
9,525	3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000
11,113	7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000
12,700	1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000
14,288	9/16 - 12	11,000	9,000	12,20	110,000	28,000	53,000
15,875	5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000
19,050	3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000
22,225	7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000
25,400	1 - 8	18,000	14,500	22,25	160,000	38,000	73,000

Maschinen-Gewindebohrer

Gewindebohrer für UNC-Gewinde



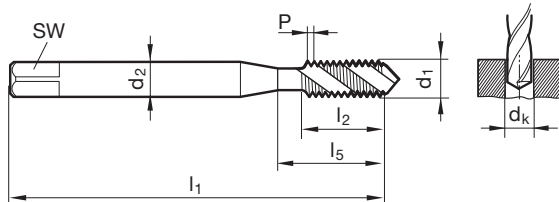
Katalog-Nr. 53783



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
2,184	2 - 56	2,800	2,100	1,85	45,000	5,000	14,500
2,845	4 - 40	3,500	2,700	2,35	56,000	7,000	18,000
3,505	6 - 32	4,000	3,000	2,85	56,000	8,000	20,000
4,166	8 - 32	4,500	3,400	3,50	63,000	8,000	21,000
4,826	10 - 24	6,000	4,900	3,90	70,000	11,000	25,000
5,486	12 - 24	6,000	4,900	4,50	80,000	11,000	30,000
6,350	1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000
7,938	5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000
9,525	3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000
11,113	7/16 - 14	8,000	6,200	9,40	100,000	18,000	42,000
12,700	1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000
14,288	9/16 - 12	11,000	9,000	12,20	110,000	21,000	53,000
15,875	5/8 - 11	12,000	9,000	13,50	110,000	24,000	53,000
19,050	3/4 - 10	14,000	11,000	16,50	125,000	25,000	62,000
22,225	7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000
25,400	1 - 8	18,000	14,500	22,25	160,000	32,000	73,000

Maschinen-Gewindebohrer

Gewindebohrer für UNF-Gewinde



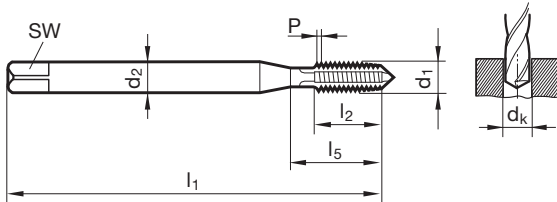
Katalog-Nr. 53784



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Durchgangsgewinde
- mit Schälanschnitt
- Spanförderung in Vorschubrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
2,184	2 - 64	2,800	2,100	1,85	45,000	9,000	14,500
2,845	4 - 48	3,500	2,700	2,40	56,000	10,000	18,000
3,505	6 - 40	4,000	3,000	2,95	56,000	11,000	20,000
4,166	8 - 36	4,500	3,400	3,50	63,000	12,000	21,000
4,826	10 - 32	6,000	4,900	4,10	70,000	14,000	25,000
5,486	12 - 28	6,000	4,900	4,60	80,000	16,000	30,000
6,350	1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000
7,938	5/16 - 24	8,000	6,200	6,90	90,000	17,000	35,000
9,525	3/8 - 24	10,000	8,000	8,50	90,000	18,000	35,000
11,113	7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000
12,700	1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000
14,288	9/16 - 18	11,000	9,000	12,90	100,000	22,000	40,000
15,875	5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000
19,050	3/4 - 16	14,000	11,000	17,50	110,000	25,000	44,000
22,225	7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000
25,400	1 - 12	18,000	14,500	23,25	140,000	28,000	50,000

Maschinen-Gewindebohrer

Gewindebohrer für UNF-Gewinde

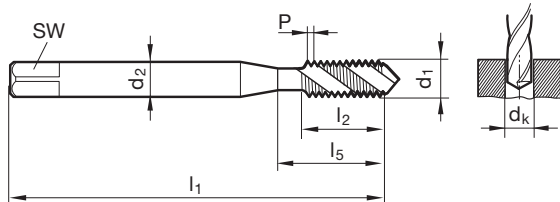


Katalog-Nr. 53785



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279



- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe

Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
2,184	2 - 64	2,800	2,100	1,85	45,000	5,000	14,500
2,845	4 - 48	3,500	2,700	2,40	56,000	6,000	18,000
3,505	6 - 40	4,000	3,000	2,95	56,000	6,500	20,000
4,166	8 - 36	4,500	3,400	3,50	63,000	7,000	21,000
4,826	10 - 32	6,000	4,900	4,10	70,000	8,500	25,000
5,486	12 - 28	6,000	4,900	4,60	80,000	9,500	30,000
6,350	1/4 - 28	7,000	5,500	5,50	80,000	9,500	30,000
7,938	5/16 - 24	8,000	6,200	6,90	90,000	11,500	35,000
9,525	3/8 - 24	10,000	8,000	8,50	90,000	11,500	35,000
11,113	7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000
12,700	1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000
14,288	9/16 - 18	11,000	9,000	12,90	100,000	14,000	40,000
15,875	5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000
19,050	3/4 - 16	14,000	11,000	17,50	110,000	16,000	44,000
22,225	7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000
25,400	1 - 12	18,000	14,500	23,25	140,000	22,000	50,000

Maschinen-Gewindebohrer

Gewindebohrer für BSW-Gewinde



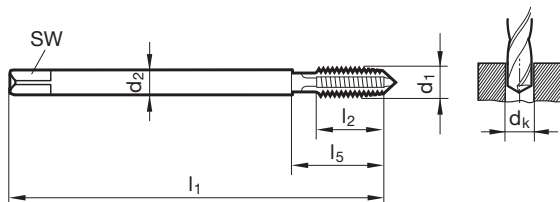
Katalog-Nr. 53793



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- universell einsetzbar
- Spanförderung in Vorschubrichtung
- mit Schälanschnitt
- für Durchgangsgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
3,175	W1/8	40	3,500	2,700	2,50	56,000	11,000	18,000
4,762	W3/16	24	6,000	4,900	3,60	70,000	14,000	25,000
6,350	W1/4	20	7,000	5,500	5,10	80,000	16,000	30,000
7,938	W5/16	18	8,000	6,200	6,50	90,000	18,000	35,000
9,525	W3/8	16	10,000	8,000	7,90	100,000	20,000	39,000
11,113	W7/16	14	8,000	6,200	9,20	100,000	22,000	42,000
12,700	W1/2	12	9,000	7,000	10,50	110,000	25,000	49,000
15,876	W5/8	11	12,000	9,000	13,50	110,000	30,000	53,000
22,226	W7/8	9	18,000	14,500	19,25	140,000	35,000	62,000
25,401	W1	8	18,000	14,500	22,00	160,000	38,000	73,000

Maschinen-Gewindebohrer

Gewindebohrer für BSW-Gewinde



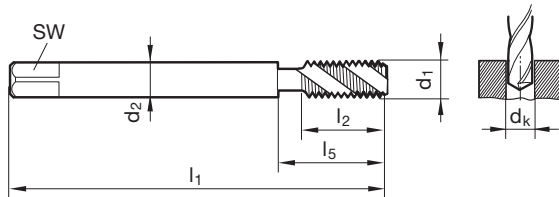
Katalog-Nr. 53794



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Arbeitsrichtwerte
Seite 258-279

- universell einsetzbar
- Spanförderung in Schafrichtung
- Nuten mit ca. 45° Rechtsdrall
- für Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
3,175	W1/8	40	3,500	2,700	2,50	56,000	7,000	18,000
4,762	W3/16	24	6,000	4,900	3,60	70,000	11,000	25,000
6,350	W1/4	20	7,000	5,500	5,10	80,000	13,000	30,000
7,938	W5/16	18	8,000	6,200	6,50	90,000	14,000	35,000
9,525	W3/8	16	10,000	8,000	7,90	100,000	16,000	39,000
11,113	W7/16	14	8,000	6,200	9,20	100,000	18,000	42,000
12,700	W1/2	12	9,000	7,000	10,50	110,000	20,000	49,000
15,876	W5/8	11	12,000	9,000	13,50	110,000	24,000	53,000
22,226	W7/8	9	18,000	14,500	19,25	140,000	28,000	62,000
25,401	W1	8	18,000	14,500	22,00	160,000	32,000	73,000

Maschinen-Gewindebohrer

Gewindebohrer für Whitworth-Rohrgewinde



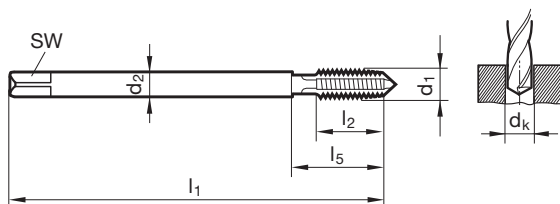
Katalog-Nr. 53795



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- universell einsetzbar
- Spanförderung in Vorschubrichtung
- mit Schälanschnitt
- für Durchgangsgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
7,723	Rp1/16	28	6,000	4,900	6,55	90,000	18,000	30,000
9,728	Rp1/8	28	7,000	5,500	8,60	90,000	18,000	35,000
13,157	Rp1/4	19	11,000	9,000	11,50	100,000	20,000	40,000
16,662	Rp3/8	19	12,000	9,000	15,00	100,000	22,000	44,000
20,955	Rp1/2	14	16,000	12,000	18,50	125,000	25,000	44,000
26,441	Rp3/4	14	20,000	16,000	24,00	140,000	28,000	53,000

Maschinen-Gewindebohrer

Gewindebohrer für Whitworth-Rohrgewinde



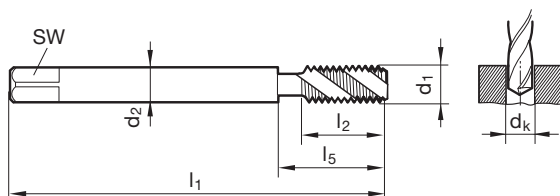
Katalog-Nr. 53796



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- universell einsetzbar
- Spanförderung in Schafrichtung
- Nuten mit ca. 45° Rechtsdrall
- für Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Code-Nr.	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
7,723	Rp1/16	28	6,000	4,900	6,55	90,000	11,000	30,000
9,728	Rp1/8	28	7,000	5,500	8,60	90,000	11,000	35,000
13,157	Rp1/4	19	11,000	9,000	11,50	100,000	14,000	40,000
16,662	Rp3/8	19	12,000	9,000	15,00	100,000	14,000	44,000
20,955	Rp1/2	14	16,000	12,000	18,50	125,000	18,000	44,000
26,441	Rp3/4	14	20,000	16,000	24,00	140,000	20,000	53,000

Maschinen-Gewindebohrer

Gewindebohrer für Whitworth-Rohrgewinde



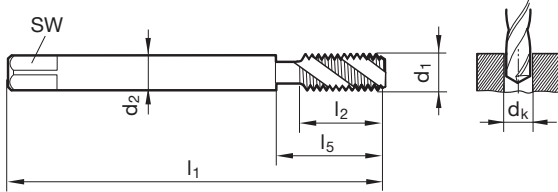
Katalog-Nr. 53775



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Grundgewinde
- Nuten mit ca. 45° Rechtsdrall
- Spanförderung in Schafrichtung
- kurzer Anschnitt für Gewindetiefen nahe Bohrungsgrund
- universell einsetzbar
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- NE-Metalle
- Gusswerkstoffe



Gewindewerkzeuge

Code-Nr.	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
7,723	G1/16	28	6,000	4,900	6,80	90,000	11,000	30,000
9,728	G1/8	28	7,000	5,500	8,80	90,000	11,000	35,000
13,157	G1/4	19	11,000	9,000	11,80	100,000	14,000	40,000
16,662	G3/8	19	12,000	9,000	15,25	100,000	14,000	44,000
20,955	G1/2	14	16,000	12,000	19,00	125,000	18,000	44,000
22,911	G5/8	14	18,000	14,500	21,00	125,000	18,000	48,000
26,441	G3/4	14	20,000	16,000	24,50	140,000	20,000	53,000
30,201	G7/8	14	22,000	18,000	28,25	150,000	22,000	53,000
33,249	G1	11	25,000	20,000	30,75	160,000	24,000	56,000

Gewindeformer mit Schmiernuten

Gewindeformer für Metrische ISO-Gewinde



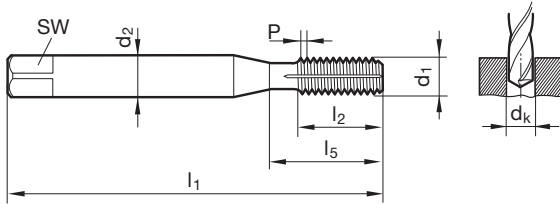
Katalog-Nr. 53630



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,90	40,000	4,000	4,000
M1,2	0,250	2,500	2,100	1,10	40,000	4,800	4,800
M1,4	0,300	2,500	2,100	1,25	40,000	5,600	5,600
M1,6	0,350	2,500	2,100	1,45	40,000	6,400	6,400
M1,7	0,350	2,500	2,100	1,55	40,000	6,800	6,800
M1,8	0,350	2,500	2,100	1,65	40,000	7,300	7,300
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M4,5	0,750	6,000	4,900	4,20	70,000	14,000	25,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M9	1,250	9,000	7,000	8,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000
M11	1,500	8,000	6,200	10,30	100,000	20,000	42,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Gewindeformer mit Schmiernuten

Gewindeformer für Metrische ISO-Gewinde



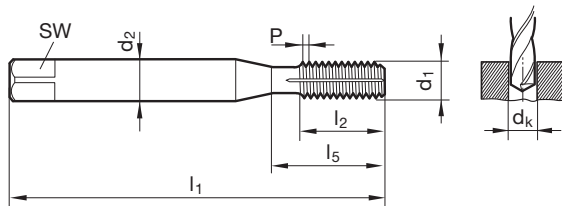
Katalog-Nr. 53631



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Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Gewindeformer mit Schmiernuten

Gewindeformer für Metrische ISO-Feingewinde



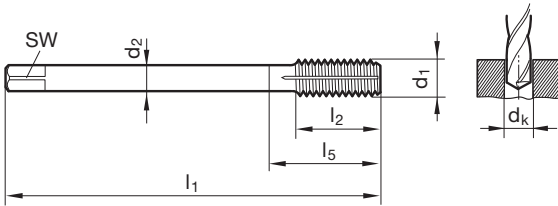
Katalog-Nr. 53632



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Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



Code-Nr.	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
3,002	M3 x 0,35	2,200	1,800	2,85	56,000	7,000	18,000
4,002	M4 x 0,35	2,800	2,100	3,85	63,000	8,000	21,000
4,003	M4 x 0,5	2,800	2,100	3,80	63,000	8,000	21,000
5,003	M5 x 0,5	3,500	2,700	4,80	70,000	10,000	25,000
6,003	M6 x 0,5	4,500	3,400	5,75	80,000	13,000	30,000
6,004	M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000
8,004	M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000
8,005	M8 x 1	6,000	4,900	7,55	90,000	17,000	35,000
9,005	M9 x 1	7,000	5,500	8,55	90,000	16,000	35,000
10,004	M10 x 0,75	7,000	5,500	9,65	90,000	16,000	35,000
10,005	M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000
10,006	M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000
11,005	M11 x 1	8,000	6,200	10,55	90,000	20,000	33,000
12,005	M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000
12,006	M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000
12,007	M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000
14,005	M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000
14,006	M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000
14,007	M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000
16,005	M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000
16,007	M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000
18,005	M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000
18,007	M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000
18,008	M18 x 2	14,000	11,000	17,10	125,000	30,000	58,000
20,005	M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000
20,007	M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000
20,008	M20 x 2	16,000	12,000	19,10	140,000	32,000	60,000
22,005	M22 x 1	18,000	14,500	21,55	125,000	25,000	44,000
22,007	M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000
22,008	M22 x 2	18,000	14,500	21,10	140,000	32,000	62,000
24,005	M24 x 1	18,000	14,500	23,55	140,000	28,000	48,000
24,007	M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000
24,008	M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000

Gewindeformer mit Schmiernuten

Gewindeformer für UNC-Gewinde



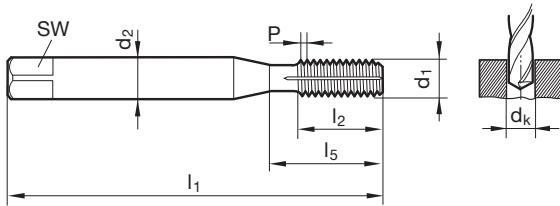
Katalog-Nr. 53633



P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



Code-Nr.	d1	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
2,845	4 - 40	3,500	2,700	2,55	56,000	11,000	18,000
3,505	6 - 32	4,000	3,000	3,15	56,000	12,000	20,000
4,166	8 - 32	4,500	3,400	3,80	63,000	12,000	21,000
4,826	10 - 24	6,000	4,900	4,35	70,000	14,000	25,000
5,486	12 - 24	6,000	4,900	5,00	80,000	16,000	30,000
6,350	1/4 - 20	7,000	5,500	5,75	80,000	16,000	30,000
7,938	5/16 - 18	8,000	6,200	7,30	90,000	18,000	35,000
9,525	3/8 - 16	10,000	8,000	8,80	90,000	20,000	35,000
11,113	7/16 - 14	8,000	6,200	10,30	100,000	22,000	42,000
12,700	1/2 - 13	9,000	7,000	11,80	100,000	25,000	40,000
14,288	9/16 - 12	11,000	9,000	13,30	100,000	28,000	40,000
15,875	5/8 - 11	12,000	9,000	14,80	100,000	30,000	44,000
19,050	3/4 - 10	14,000	11,000	17,90	110,000	33,000	44,000

Gewindeformer mit Schmiernuten

Gewindeformer für UNF-Gewinde



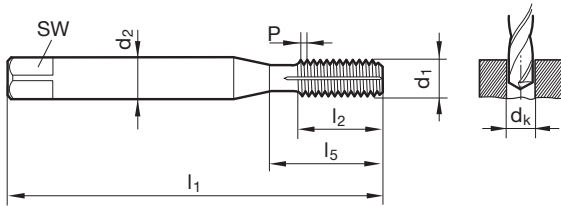
Katalog-Nr. 53634



P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
2,845	4 - 48	3,500	2,700	2,60	56,000	10,000	18,000
3,505	6 - 40	4,000	3,000	3,20	56,000	11,000	20,000
4,166	8 - 36	4,500	3,400	3,85	63,000	12,000	21,000
4,826	10 - 32	6,000	4,900	4,45	70,000	14,000	25,000
5,486	12 - 28	6,000	4,900	5,10	80,000	16,000	30,000
6,350	1/4 - 28	7,000	5,500	5,95	80,000	16,000	30,000
7,938	5/16 - 24	8,000	6,200	7,45	90,000	18,000	35,000
9,525	3/8 - 24	10,000	8,000	9,05	100,000	18,000	39,000
11,113	7/16 - 20	8,000	6,200	10,55	100,000	22,000	42,000
12,700	1/2 - 20	9,000	7,000	12,10	100,000	20,000	40,000
14,288	9/16 - 18	11,000	9,000	13,65	100,000	22,000	40,000
15,875	5/8 - 18	12,000	9,000	15,25	100,000	22,000	44,000
19,050	3/4 - 16	14,000	11,000	18,35	110,000	25,000	44,000

Gewindeformer ohne Schmiernuten

Gewindeformer für Whitworth-Rohrgewinde



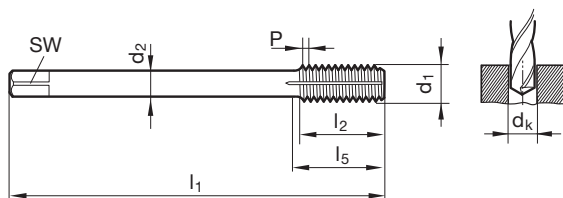
Katalog-Nr. 53635



P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen



Code-Nr.	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
9,728	G1/8	28	7,000	5,500	9,30	90,000	18,000	35,000
13,157	G1/4	19	11,000	9,000	12,50	100,000	20,000	40,000
16,662	G3/8	19	12,000	9,000	16,00	100,000	22,000	44,000
20,955	G1/2	14	16,000	12,000	20,00	125,000	25,000	44,000

Gewindeformer mit Schmiernuten

Kühlkanal-Gewindeformer für Metr. ISO-Gewinde



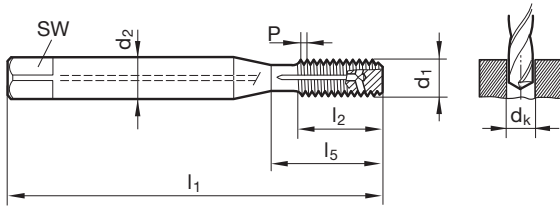
Katalog-Nr. 53610



P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen
- radialer Kühlmittelaustritt



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Gewindeformer mit Schmiernuten

Kühlkanal-Gewindeformer für Metr. ISO-Gewinde



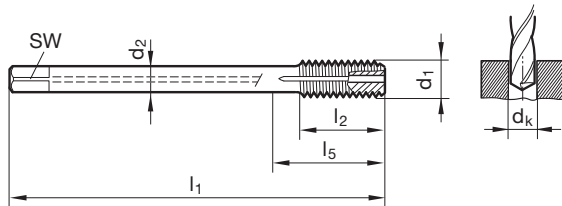
Katalog-Nr. 53618



P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

Gewindewerkzeuge



- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen
- mit innenliegendem Kühlkanal ≥ M5
- kurzer Anschnitt für Gewindetiefen nahe Bohrungsgrund

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Gewindeformer mit Schmiernuten

Kühlkanal-Gewindeformer für Metr. ISO-Feingewinde



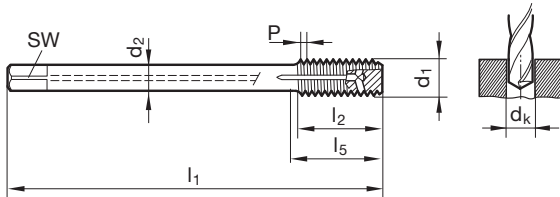
Katalog-Nr. 53612

Durativ N-X	~DIN 374	C	HSS-E- PM	TiCN	R	6HX
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P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen
- radialer Kühlmittelaustritt



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	9,40	100,000	14,000	39,000
12,006	M12 x 1,25	9,000	7,000	11,40	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000
14,006	M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000
14,007	M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000
20,007	M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000

Gewindeformer mit Schmiernuten

Kühlkanal-Gewindeformer für Metr. ISO-Feingewinde



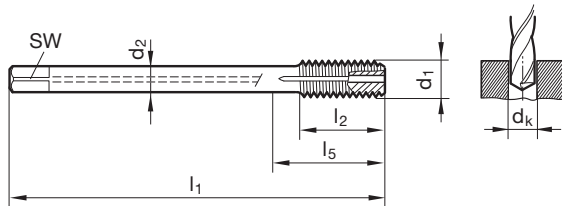
Katalog-Nr. 53619

Durativ N-X	~DIN 374	E	HSS-E- PM	TiCN	R	6HX
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P	M	K	N	S	H
•	•	•	○	•	

Arbeitsrichtwerte
Seite 258-279

- für Durchgangs- und Grundgewinde
- Stahlwerkstoffe bis 1200 N/mm²
- rost-/säurebeständige Stähle
- formbare Gusswerkstoffe
- formbare Nichteisenmetalle
- Sonderlegierungen
- mit axialem Kühlkanal



Code-Nr.	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000
10,005	M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000
10,006	M10 x 1,25	7,000	5,500	9,40	100,000	14,000	39,000
12,006	M12 x 1,25	9,000	7,000	11,40	100,000	16,000	40,000
12,007	M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000
14,006	M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000
14,007	M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000
16,007	M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000
20,007	M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000

Bohrgewindefräser

Bohrgewindefräser für Metrische ISO-Gewinde



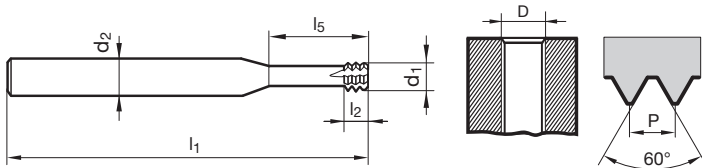
Katalog-Nr. 53948



P	M	K	N	S	H
•	•	•	•	•	≤ 66

Arbeitsrichtwerte
Seite 258-279

- zirkulares Gewindefräsen, Kernloch und Gewinde in einem Arbeitsgang
- universeller Einsatz, auch für gehärtete Stähle bis 66 HRC
- linksschneidendes Werkzeug für höchste Stabilität beim Gleichlaufräsen
- mit Kühlrillen am Schaft
- für Gewindetiefen bis 2,5xD



Code-Nr.	D	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	Z
2,000	M2	0,400	1,400	3,000	39,000	1,200	5,000	4
2,500	M2,5	0,450	1,800	3,000	39,000	1,300	6,500	4
3,000	M3	0,500	2,400	6,000	58,000	1,500	7,500	4
3,500	M3,5	0,600	2,700	6,000	58,000	1,800	9,000	4
4,000	M4	0,700	3,100	6,000	58,000	2,100	10,000	4
5,000	M5	0,800	3,800	6,000	58,000	2,400	12,500	4
6,000	M6	1,000	4,600	8,000	64,000	3,000	15,000	4
6,003	M5x0,5/M6x0,5	0,500	3,800	8,000	58,000	1,500	15,000	4
8,000	M8	1,250	6,200	8,000	64,000	3,600	20,000	4
8,004	M6x0,75/M8x0,75	0,750	4,600	8,000	64,000	2,300	20,000	4
10,000	M10	1,500	7,500	10,000	73,000	4,500	25,000	4
12,000	M12	1,750	9,000	10,000	73,000	5,200	30,000	4
12,005	M10x1/M12x1	1,000	7,500	10,000	64,000	3,000	25,000	4
16,000	M16	2,000	11,500	12,000	90,000	6,000	40,000	4
16,007	M14x1,5/M16x1,5	1,500	11,500	12,000	90,000	4,500	40,000	4

Bohrgewindefräser

Bohrgewindefräser für UNC-/UNF-Gewinde



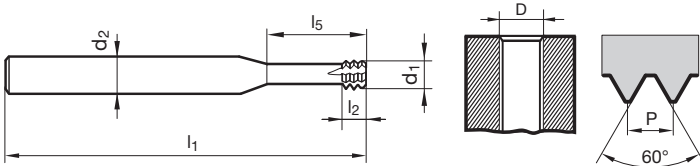
Katalog-Nr. 53949



P	M	K	N	S	H
•	•	•	•	•	≤ 66

Arbeitsrichtwerte
Seite 258-279

- zirkulares Gewindefräsen, Kernloch und Gewinde in einem Arbeitsgang
- universeller Einsatz, auch für gehärtete Stähle bis 66 HRC
- linksschneidendes Werkzeug für höchste Stabilität beim Gleichlaufräsen
- mit Kühlrillen am Schaft
- für Gewindetiefen bis 2,5xD



Code-Nr.	D	P G/inch	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	Z
1,853	UNF No 1	72	1,400	3,000	39,000	1,100	5,000	4
1,854	UNC No 1+UNF No 2	64	1,400	3,000	39,000	1,200	5,000	4
2,184	UNC No 2+UNF No 3	56	1,600	3,000	39,000	1,400	5,500	4
2,515	UNC No 3+UNF No 4	48	1,900	3,000	39,000	1,600	6,500	4
2,845	UNC No 4	40	2,100	6,000	58,000	1,900	7,500	4
3,175	UNC No 5+UNF No 6	40	2,400	6,000	58,000	1,900	8,000	4
3,505	UNC No 6	32	2,600	6,000	58,000	2,400	9,000	4
4,165	UNF No 8	36	3,200	6,000	58,000	2,100	10,500	4
4,166	UNC No 8	32	3,100	6,000	58,000	2,400	10,500	4
4,825	UNF No10	32	3,600	6,000	58,000	2,400	12,500	4
4,826	UNC No10+UNC No12	24	3,600	6,000	58,000	3,200	12,500	4
5,485	UNF No12	28	4,100	6,000	58,000	2,700	14,000	4
6,349	UNF 1/4	28	4,800	6,000	58,000	2,700	16,000	4
6,350	UNC 1/4	20	4,800	6,000	58,000	3,800	16,000	4
7,937	UNF 5/16+UNF 3/8	24	6,300	8,000	64,000	3,200	20,000	4
7,938	UNC 5/16	18	6,300	8,000	64,000	4,200	20,000	4
9,525	UNC 3/8	16	7,200	8,000	64,000	4,800	24,000	4
11,112	UNF 7/16	20	8,300	10,000	73,000	3,800	28,000	4
11,113	UNC 7/16	14	8,300	10,000	73,000	5,400	28,000	4
12,700	UNF 1/2	20	9,700	10,000	73,000	3,800	31,000	4
15,874	UNF 5/8	18	11,800	12,000	90,000	4,200	40,000	4

Bohrgewindefräser

Bohrgewindefräser für Rohrgewinde



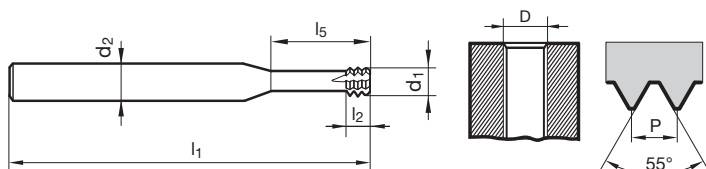
Katalog-Nr. 53950



P	M	K	N	S	H
•	•	•	•	•	≤ 66

Arbeitsrichtwerte
Seite 258-279

- zirkulares Gewindefräsen, Kernloch und Gewinde in einem Arbeitsgang
- universeller Einsatz, auch für gehärtete Stähle bis 66 HRC
- linksschneidendes Werkzeug für höchste Stabilität beim Gleichlaufräsen
- mit Kühlrillen am Schaft
- für Gewindetiefen bis 2,5xD



Code-Nr.	D	P G/inch	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	Z
9,728	G1/16-G1/8	28	6,100	8,000	64,000	2,700	24,000	4
16,662	G1/4-G3/8	19	10,300	12,000	90,000	4,000	40,000	4
26,441	G1/2-G5/8-G3/4	14	15,700	16,000	105,000	5,400	50,000	4

Gewindefräser

Gewindefräser mit Senkfase für Metrische ISO-Gewinde



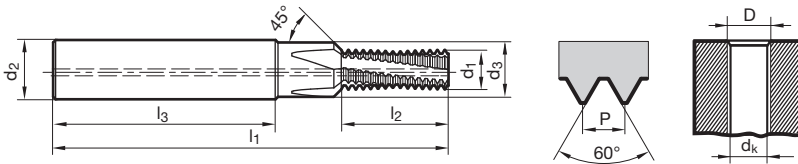
Katalog-Nr. 53890



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 258-279

- universelle Verwendung
- mit Innenkühlung ab M4
- erhöhte Schneidenzahl für kürzeste Bearbeitungszeiten
- sehr hohe Prozesssicherheit durch neue Geometrie
- für Gewindetiefen bis 2xD



Code-Nr.	D	P mm	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l2 mm	l3 mm	Z
3,000	M3	0,500	2,300	6,000	3,400	2,50	48,000	6,800	36,000	5
4,000	M4	0,700	3,100	6,000	4,500	3,30	48,000	8,800	36,000	5
4,003	M4 x 0,5	0,500	3,100	6,000	4,500	3,50	48,000	8,800	36,000	5
5,000	M5	0,800	4,000	6,000	5,500	4,20	54,000	10,800	36,000	5
5,003	M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	10,800	36,000	5
6,000	M6	1,000	4,700	8,000	6,600	5,00	62,000	13,500	36,000	6
6,003	M6 x 0,5	0,500	4,700	8,000	6,600	5,50	62,000	12,800	36,000	6
6,004	M6 x 0,75	0,750	4,700	8,000	6,600	5,20	62,000	13,100	36,000	6
8,000	M8	1,250	6,300	10,000	9,000	6,80	74,000	18,100	40,000	7
8,005	M8 x 1	1,000	6,300	10,000	9,000	7,00	74,000	17,500	40,000	7
10,000	M10	1,500	7,800	12,000	11,000	8,50	80,000	21,800	45,000	7
10,005	M10 x 1	1,000	7,800	12,000	11,000	9,00	80,000	21,500	45,000	7
10,006	M10 x 1,25	1,250	7,800	12,000	11,000	8,80	80,000	21,900	45,000	7
12,000	M12	1,750	9,500	14,000	13,500	10,20	90,000	25,400	45,000	7
12,005	M12 x 1	1,000	9,500	14,000	13,500	11,00	90,000	25,500	45,000	7
12,007	M12 x 1,5	1,500	9,500	14,000	13,500	10,50	90,000	26,300	45,000	7
14,000	M14	2,000	10,800	16,000	15,500	12,00	102,000	31,000	48,000	7
14,007	M14 x 1,5	1,500	10,800	16,000	15,500	12,50	102,000	30,800	48,000	7
16,000	M16	2,000	12,700	18,000	17,500	14,00	102,000	35,000	48,000	8
16,007	M16 x 1,5	1,500	12,700	18,000	17,500	14,50	102,000	33,800	48,000	8

Gewindefräser

Gewindefräser ohne Senkfase für Metr. ISO-Gewinde



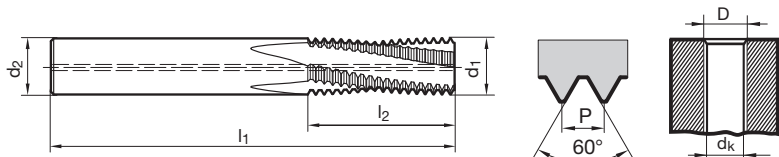
Katalog-Nr. 53860



P	M	K	N	S	H
●	○	●	●	○	≤ 55

Arbeitsrichtwerte
Seite 258-279

- Gewindefräser ohne Senkfase, mit Spiralnut und innerer Kühlmittelzufuhr mit axialem Austritt
- universelle Verwendung
- extralange Ausführung für Gewindetiefen bis 2,5xD



Code-Nr.	D	P mm	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	Z
6,000	M6	1,000	4,800	6,000	5,00	54,000	16,500	3
8,000	M8	1,250	6,400	8,000	6,80	62,000	21,900	3
10,000	M10	1,500	7,950	10,000	8,50	74,000	26,300	3
12,000	M12	1,750	9,950	10,000	10,20	74,000	32,400	4
14,000	M14	2,000	11,200	12,000	12,00	90,000	37,000	4
16,000	M16	2,000	12,800	14,000	14,00	90,000	43,000	4
20,000	M20	2,500	14,950	16,000	17,50	102,000	48,800	4

Gewindefräser

Gewindefräser ohne Senkfase für Metr. ISO-Gewinde



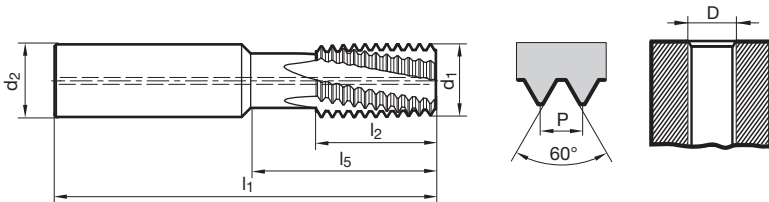
Katalog-Nr. 73830



P	M	K	N	S	H
•	•	•	•	•	≤ 55

Arbeitsrichtwerte
Seite 258-279

- Gewindefräser ohne Senkfase, mit Spiralnut und innerer Kühlmittelzufuhr mit axialem Austritt
- Universalgewindefräser für Innengewinde M / MF
- für Gewindetiefen bis 2xD



Code-Nr.	D	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	Z
8,050	> 10	0,500	7,950	8,000	64,000	20,000	20,000	4
10,100	> 12	1,000	9,950	10,000	70,000	16,000	25,000	4
10,125	> 14	1,250	9,950	10,000	70,000	16,000	25,000	4
10,150	> 14	1,500	9,950	10,000	70,000	16,000	25,000	4
12,100	> 16	1,000	11,950	12,000	80,000	20,000	31,000	4
12,125	> 16	1,250	11,950	12,000	80,000	20,000	31,000	4
12,150	> 16	1,500	11,950	12,000	80,000	20,000	31,000	4
16,100	> 18	1,000	15,950	16,000	90,000	25,000	40,000	5
16,150	> 20	1,500	15,950	16,000	90,000	25,000	40,000	5
16,200	> 22	2,000	15,950	16,000	90,000	25,000	40,000	5
18,300	> 24	3,000	17,950	18,000	102,000	33,000	50,000	5
20,100	> 24	1,000	19,950	20,000	105,000	33,000	50,000	5
20,150	> 26	1,500	19,950	20,000	105,000	33,000	50,000	5
20,200	> 26	2,000	19,950	20,000	105,000	33,000	50,000	5
20,250	> 26	2,500	19,950	20,000	105,000	33,000	50,000	5
20,300	> 27	3,000	19,950	20,000	105,000	33,000	50,000	5
20,350	> 30	3,500	19,950	20,000	105,000	33,000	50,000	5

Gewindefräser

Gewindefräser ohne Senkfase für Whitworth-Rohrgewinde



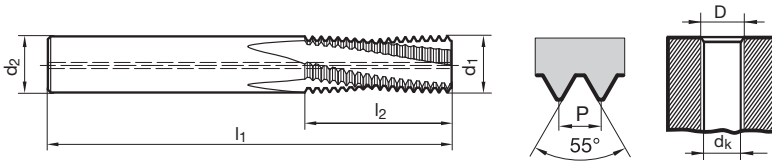
Katalog-Nr. 53831



P	M	K	N	S	H
●	○	●	●	○	≤ 55

Arbeitsrichtwerte
Seite 258-279

- Gewindefräser ohne Senkfase, mit Spiralnut und innerer Kühlmittelzufuhr mit axialem Austritt
- universelle Verwendung
- für Gewindetiefen bis 2xD



Code-Nr.	D	P G/inch	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	Z
9,728	G1/8	28	7,950	8,000	8,80	64,000	21,300	3
13,157	G1/4	19	10,500	12,000	11,80	90,000	28,700	4
16,662	G3/8	19	13,600	14,000	15,25	90,000	35,400	4

Gewindefräser

Mehrbereichsgewindefräser für Whitworth-Rohrgewinde



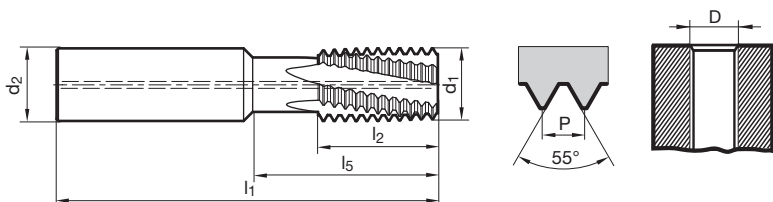
Katalog-Nr. 53832



P	M	K	N	S	H
•	•	•	•	•	≤ 55

Arbeitsrichtwerte
Seite 258-279

- Gewindefräser ohne Senkfase, mit Spiralnut und innerer Kühlmittelzufuhr mit axialem Austritt
- Universalgewindefräser für Innengewinde
- für Gewindetiefen bis 2xD



Code-Nr.	D	P G/inch	d1 mm	d2 mm	l1 mm	l5 mm	l2 mm	Z
10,190	≥ 1/4	19	9,950	10,000	70,000	25,000	16,000	4
16,140	≥ 1/2	14	15,950	16,000	90,000	40,000	25,000	5
20,110	≥ 1	11	19,950	20,000	105,000	50,000	33,000	5

Gewindefräser

Mikrogewindefräser für Metrische ISO-Gewinde

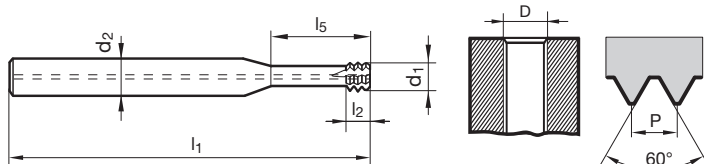


Katalog-Nr. 53892



P	M	K	N	S	H
•	•	•	•	•	≤ 55

Arbeitsrichtwerte
Seite 258-279



- universelle Verwendung
- M1.6 - M3 mit 2 Kühlrillen
- mit Innenkühlung ab M3.5
- linksschneidende Geometrie
- erhöhte Schneidenzahl für kürzeste Bearbeitungszeiten

Code-Nr.	D	P mm	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	l5 mm	Z
1,600	M1,6	0,350	1,200	3,000	1,25	39,000	1,100	4,800	3
1,800	M1,8	0,350	1,400	3,000	1,45	39,000	1,100	5,400	4
2,000	M2	0,400	1,550	3,000	1,60	39,000	1,200	6,000	4
2,500	M2,5	0,450	1,950	3,000	2,05	39,000	1,400	7,500	4
3,000	M3	0,500	2,400	3,000	2,50	39,000	1,500	9,500	5
3,500	M3,5	0,600	2,800	6,000	2,90	58,000	1,800	11,000	5
4,000	M4	0,700	3,200	6,000	3,30	58,000	2,100	12,500	5
5,000	M5	0,800	4,000	6,000	4,20	58,000	2,400	16,000	6
6,000	M6	1,000	4,800	6,000	5,00	58,000	3,000	20,000	6
8,000	M8	1,250	5,950	8,000	6,80	73,000	3,800	24,000	7
10,000	M10	1,500	7,800	8,000	8,50	73,000	4,500	33,000	7
12,000	M12	1,750	9,000	10,000	10,20	84,000	5,300	38,000	7
16,000	M16	2,000	11,800	12,000	14,00	100,000	6,000	48,000	8
20,000	M20	2,500	15,000	16,000	17,50	105,000	7,500	60,000	8

Gewindefräser

Mikrogewindefräser für Metrische ISO-Gewinde



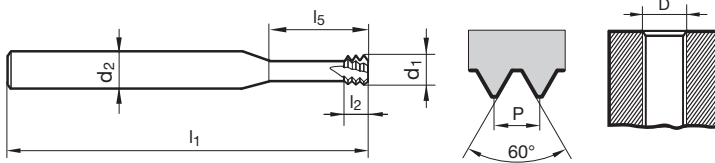
Katalog-Nr. 53840



P	M	K	N	S	H
•	•	•	•	•	

Arbeitsrichtwerte
Seite 258-279

- universelle Verwendung
- lange Ausführung
- für Gewindetiefen bis 3xD



Code-Nr.	D	P mm	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	l5 mm	Z
1,600	M1,6	0,350	1,200	3,000	1,25	39,000	1,100	4,800	3
1,800	M1,8	0,350	1,400	3,000	1,45	39,000	1,100	5,400	3
2,000	M2	0,400	1,550	3,000	1,60	39,000	1,200	6,000	4
2,500	M2,5	0,450	1,950	3,000	2,05	39,000	1,400	7,500	4
3,000	M3	0,500	2,400	6,000	2,50	58,000	1,500	9,500	4
3,500	M3,5	0,600	2,800	6,000	2,90	58,000	1,800	11,000	4
4,000	M4	0,700	3,200	6,000	3,30	58,000	2,100	12,500	4
5,000	M5	0,800	4,000	6,000	4,20	58,000	2,400	16,000	4
6,000	M6	1,000	4,800	6,000	5,00	58,000	3,000	20,000	4
8,000	M8	1,250	5,950	6,000	6,80	58,000	3,800	24,000	4
10,000	M10	1,500	7,800	8,000	8,50	73,000	4,500	33,000	4
12,000	M12	1,750	9,000	10,000	10,20	84,000	5,300	38,000	4
16,000	M16	2,000	11,800	12,000	14,00	84,000	6,000	35,000	5

Gewindefräser

Mikrogewindefräser für Metrische ISO-Gewinde



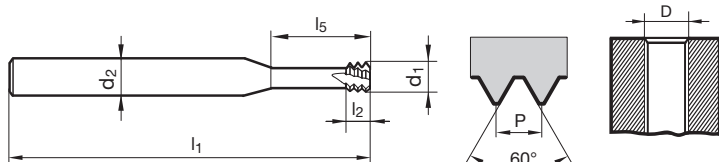
Katalog-Nr. 53850



P	M	K	N	S	H
				○	●

Arbeitsrichtwerte
Seite 258-279

- für die Hartbearbeitung 45-65 HRC
- lange Ausführung
- für Gewindetiefen bis 3xD



Code-Nr.	D	P mm	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	l5 mm	Z
2,000	M2	0,400	1,550	3,000	1,60	39,000	1,200	6,000	4
2,500	M2,5	0,450	1,950	3,000	2,05	39,000	1,400	7,500	4
3,000	M3	0,500	2,350	6,000	2,50	58,000	1,500	9,500	4
4,000	M4	0,700	3,100	6,000	3,30	58,000	2,100	12,500	4
5,000	M5	0,800	3,800	6,000	4,20	58,000	2,400	16,000	4
6,000	M6	1,000	4,800	6,000	5,00	58,000	3,000	20,000	4
8,000	M8	1,250	5,950	6,000	6,80	58,000	3,800	24,000	4
10,000	M10	1,500	7,800	8,000	8,50	64,000	4,500	23,000	4
12,000	M12	1,750	9,000	10,000	10,20	73,000	5,300	26,000	5

Gewindefräser

Mikrogewindefräser für Whitworth-Rohrgewinde



Katalog-Nr. 53841

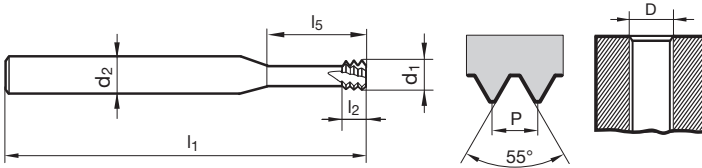


P	M	K	N	S	H
•	•	•	•	•	

Arbeitsrichtwerte
Seite 258-279

- universelle Verwendung
- lange Ausführung
- für Gewindetiefen bis 3xD

Gewindewerkzeuge



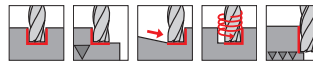
Code-Nr.	D	P G/inch	d1 mm	d2 mm	dk mm	l1 mm	l2 mm	l5 mm	Z
9,728	G1/16-G1/8	28	6,200	8,000	8,80	64,000	2,700	19,500	4
16,662	G1/4-G3/8	19	9,950	10,000	15,25	73,000	4,000	25,000	4
30,201	G1/2-G7/8	14	11,950	12,000	28,25	84,000	5,400	37,000	4
59,614	G1-G2	11	15,950	16,000	57,00	105,000	6,900	44,000	5

SuperF-UT-Fräser

SuperF-UT-Fräser Z



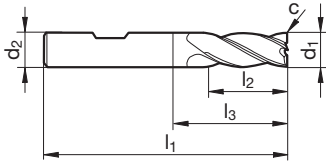
Katalog-Nr. 54577



P	M	K	N	S	H
•	•			•	

Arbeitsrichtwerte
Seite 280-293

- besonders stabil durch Kernsprung
- universell einsetzbar
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Zentrumschnitt
- ungleiche Teilung
- HPC-Bearbeitung in zähen, niedrig- und hochlegierten Stählen und in schwer bearbeitbaren Sonderwerkstoffen
- auch als Satz 78882 1.000 und 78882 2.000 erhältlich



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	57,000	8,000	10,900	0,060	4	3,000
4,000	6,000	57,000	11,000	13,900	0,080	4	4,000
5,000	6,000	57,000	13,000	15,900	0,100	4	5,000
6,000	6,000	57,000	15,000	21,000	0,120	4	6,000
8,000	8,000	63,000	20,000	27,000	0,160	4	8,000
10,000	10,000	72,000	24,000	32,000	0,200	4	10,000
12,000	12,000	83,000	28,000	38,000	0,240	4	12,000
16,000	16,000	92,000	36,000	44,000	0,320	4	16,000
20,000	20,000	104,000	45,000	54,000	0,400	4	20,000

Fräswerkzeuge

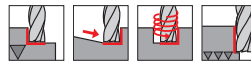
ISO	Härte	v _c	f _z (mm/z)/Ø						v _c	f _z (mm/z)/Ø							
			3	6	8	10	12	16		20	3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18	120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21	120	0,013	0,026	0,035	0,050	0,06	0,08	0,10

SuperF-UT-Fräser

SuperF-UT-Fräser ZS



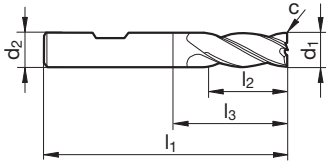
Katalog-Nr. 54578



P	M	K	N	S	H
●	●			●	

Arbeitsrichtwerte
Seite 280-293

- besonders stabil durch Kernsprung
- mit Spanteiler
- universell einsetzbar
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Zentrumschnitt
- ungleiche Teilung
- HPC-Bearbeitung in zähen, niedrig- und hochlegierten Stählen und in schwer bearbeitbaren Sonderwerkstoffen



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	57,000	12,000	14,900	0,060	4	3,000
4,000	6,000	65,000	16,000	18,900	0,080	4	4,000
5,000	6,000	65,000	20,000	22,900	0,100	4	5,000
6,000	6,000	65,000	24,000	29,000	0,120	4	6,000
8,000	8,000	75,000	32,000	39,000	0,160	4	8,000
10,000	10,000	90,000	40,000	50,000	0,200	4	10,000
12,000	12,000	100,000	46,000	55,000	0,240	4	12,000
16,000	16,000	108,000	55,000	60,000	0,320	4	16,000
20,000	20,000	126,000	65,000	76,000	0,400	4	20,000

Fräszeuge

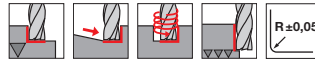
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08

SuperF-UT-Fräser

SuperF-UT-Fräser ZS-r



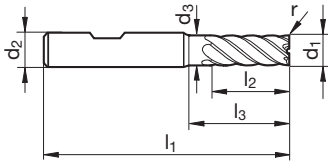
Katalog-Nr. 54555



P	M	K	N	S	H
●	●	●	○	●	

Arbeitsrichtwerte
Seite 280-293

- mit Spanteiler
- universell einsetzbar
- Werkstoffe bis 1400 N/mm²
- mit definierten Eckradien
- ohne Zentrumschnitt
- ungleiche Teilung
- Halsfreischliff



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
6,000	6,000	5,700	65,000	20,000	28,000	0,200	5	6,002
6,000	6,000	5,700	65,000	20,000	28,000	0,500	5	6,005
6,000	6,000	5,700	65,000	20,000	28,000	1,000	5	6,010
8,000	8,000	7,700	75,000	26,000	38,000	0,300	5	8,003
8,000	8,000	7,700	75,000	26,000	38,000	0,500	5	8,005
8,000	8,000	7,700	75,000	26,000	38,000	1,000	5	8,010
8,000	8,000	7,700	75,000	26,000	38,000	1,500	5	8,015
10,000	10,000	9,500	80,000	32,000	38,000	0,500	5	10,005
10,000	10,000	9,500	80,000	32,000	38,000	1,000	5	10,010
10,000	10,000	9,500	80,000	32,000	38,000	1,500	5	10,015
10,000	10,000	9,500	80,000	32,000	38,000	2,000	5	10,020
12,000	12,000	11,500	93,000	40,000	46,000	0,500	5	12,005
12,000	12,000	11,500	93,000	40,000	46,000	1,000	5	12,010
12,000	12,000	11,500	93,000	40,000	46,000	1,500	5	12,015
12,000	12,000	11,500	93,000	40,000	46,000	2,000	5	12,020
16,000	16,000	15,500	108,000	50,000	58,000	0,500	5	16,005
16,000	16,000	15,500	108,000	50,000	58,000	1,000	5	16,010
16,000	16,000	15,500	108,000	50,000	58,000	1,500	5	16,015
16,000	16,000	15,500	108,000	50,000	58,000	2,000	5	16,020
16,000	16,000	15,500	108,000	50,000	58,000	3,000	5	16,030
20,000	20,000	19,500	126,000	62,000	74,000	1,000	5	20,010
20,000	20,000	19,500	126,000	62,000	74,000	1,500	5	20,015
20,000	20,000	19,500	126,000	62,000	74,000	2,000	5	20,020
20,000	20,000	19,500	126,000	62,000	74,000	3,000	5	20,030

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08

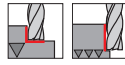
Fräswerkzeuge

SuperF-UT-Fräser

SuperF-UT-Fräser ZS-7



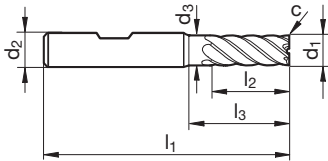
Katalog-Nr. 54581



P	M	K	N	S	H
●	●	●	○	●	

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- mit Spanteiler
- universell einsetzbar
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- ohne Zentrumschnitt
- ungleiche Teilung
- HPC-Bearbeitung in zähen, niedrig- und hochlegierten Stählen und in schwer bearbeitbaren Sonderwerkstoffen



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
6,000	6,000	5,700	65,000	20,000	28,000	0,120	7	6,000
8,000	8,000	7,700	75,000	26,000	38,000	0,160	7	8,000
10,000	10,000	9,500	80,000	32,000	38,000	0,200	7	10,000
12,000	12,000	11,500	93,000	40,000	46,000	0,240	7	12,000
16,000	16,000	15,500	108,000	50,000	58,000	0,320	7	16,000
20,000	20,000	19,500	126,000	62,000	74,000	0,400	7	20,000

Fräserwerkzeuge

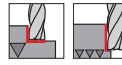
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18	120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21	120	0,013	0,026	0,035	0,050	0,06	0,08	0,10

SuperF-UT-Fräser

SuperF-UT-Fräser N-5



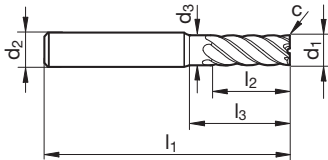
Katalog-Nr. 54583



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- größtmögliche Vorteile bei Schlicht- und Semischrupp-Operationen speziell unter HPC Bedingungen
- ungleiche Teilung
- bis 1600 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
4,000	6,000	3,800	57,000	11,000	18,000	0,050	5	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,050	5	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,050	5	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,100	5	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	5	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,100	5	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,150	5	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,150	5	20,000

Fräswerkzeuge

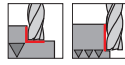
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08
K	≤ 240 HB	300	0,038	0,076	0,101	0,150	0,18	0,24	0,30	320	0,018	0,036	0,048	0,072	0,09	0,11	0,14
	≥ 240 HB	260	0,035	0,069	0,092	0,127	0,15	0,20	0,25		280	0,017	0,033	0,044	0,061	0,07	0,10
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28		460	0,018	0,036	0,048	0,066	0,08	0,11

SuperF-UT-Fräser

SuperF-UT-Fräser N-5



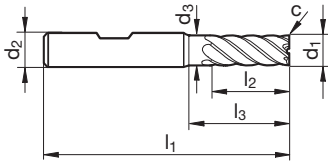
Katalog-Nr. 54584



P	M	K	N	S	H
•	•	•	•	•	

Arbeitsrichtwerte
Seite 280-293

- größtmögliche Vorteile bei Schlicht- und Semischrupp-Operationen speziell unter HPC Bedingungen
- ungleiche Teilung
- bis 1600 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
4,000	6,000	3,800	57,000	11,000	18,000	0,050	5	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,050	5	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,050	5	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,100	5	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	5	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,100	5	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,150	5	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,150	5	20,000

Fräserwerkzeuge

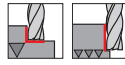
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08
K	≤ 240 HB	300	0,038	0,076	0,101	0,150	0,18	0,24	0,30	320	0,018	0,036	0,048	0,072	0,09	0,11	0,14
	≥ 240 HB	260	0,035	0,069	0,092	0,127	0,15	0,20	0,25		280	0,017	0,033	0,044	0,061	0,07	0,10
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28		460	0,018	0,036	0,048	0,066	0,08	0,11

SuperF-UT-Fräser

SuperF-UT-Fräser FS²

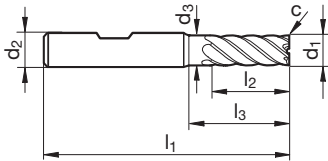


Katalog-Nr. 64560



P	M	K	N	S	H	Arbeitsrichtwerte Seite 280-293
○	●	○	●	●	○	

- Halsfreischliff
- Zentrumschnitt
- größtmögliche Vorteile bei Schlicht- und Semischrupp-Operationen speziell unter HPC Bedingungen
- zum Feinschlichten in Werkstoffen bis 50 HRC
- Mikroeckenschutz
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
8,000	8,000	7,700	63,000	19,000	26,000	0,100	6	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	6	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,100	6	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,150	6	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,150	6	20,000

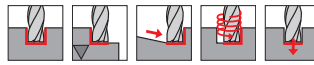
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28		460	0,018	0,036	0,048	0,066	0,08	0,11

SuperF-UT-Fräser

SuperF-UT-Fräser NX-3



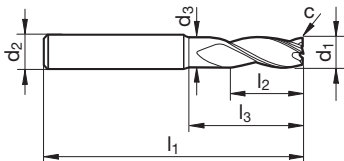
Katalog-Nr. 54586



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- angepasste Stirn- und Nutengeometrie für höchste Schnittwerte und sehr gute Spanabfuhr
- extrem steile Tauchwinkel bis 45° möglich
- hohe Standzeiten durch hochharte Beschichtung
- 3-Schneider mit vergrößerten Spanräumen
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,800	57,000	8,000	15,000	0,050	3	3,000
3,500	6,000	3,300	57,000	10,000	15,000	0,050	3	3,500
3,700	6,000	3,500	57,000	11,000	15,000	0,060	3	3,700
4,000	6,000	3,800	57,000	11,000	18,000	0,060	3	4,000
4,500	6,000	4,300	57,000	11,000	18,000	0,070	3	4,500
4,700	6,000	4,500	57,000	13,000	18,000	0,070	3	4,700
5,000	6,000	4,800	57,000	13,000	18,000	0,080	3	5,000
5,500	6,000	5,300	57,000	13,000	19,400	0,080	3	5,500
5,700	6,000	5,500	57,000	13,000	19,600	0,090	3	5,700
6,000	6,000	5,700	57,000	13,000	20,000	0,090	3	6,000
6,500	8,000	6,200	63,000	16,000	24,400	0,100	3	6,500
7,000	8,000	6,700	63,000	16,000	24,900	0,110	3	7,000
7,500	8,000	7,200	63,000	19,000	25,300	0,110	3	7,500
8,000	8,000	7,700	63,000	19,000	26,000	0,120	3	8,000
8,500	10,000	8,200	72,000	19,000	29,400	0,130	3	8,500
9,000	10,000	8,700	72,000	19,000	29,900	0,140	3	9,000
9,500	10,000	9,200	72,000	22,000	30,300	0,140	3	9,500
10,000	10,000	9,500	72,000	22,000	30,000	0,150	3	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,180	3	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,190	3	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,240	3	20,000

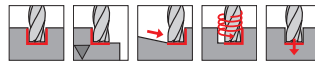
ISO	Härte	v _c	f _z (mm/z)/Ø							f _z (mm/z)/Ø										
			3	6	8	10	12	16	20	3	6	8	10	12	16	20				
P	≤ 850 N/mm ²	270	0,017	0,025	0,034	0,050	0,060	0,080	0,100		a _p = 1,0xD	a _e = 1,0xD	350	0,021	0,032	0,042	0,063	0,075	0,100	0,125
	≥ 850 N/mm ²	180	0,014	0,021	0,028	0,045	0,054	0,072	0,090				260	0,018	0,027	0,036	0,059	0,070	0,094	0,117
M	≤ 750 N/mm ²	120	0,014	0,021	0,028	0,045	0,054	0,072	0,090		a _p = 1,5xD	a _{e max} = 0,33xD	160	0,018	0,027	0,036	0,059	0,070	0,094	0,117
	≥ 750 N/mm ²	80	0,013	0,019	0,026	0,040	0,048	0,064	0,080				120	0,019	0,029	0,038	0,060	0,072	0,096	0,120
S	Ti-Basis	60	0,013	0,019	0,026	0,040	0,048	0,064	0,080	110	0,017	0,025	0,033	0,052	0,062	0,083	0,104			
K	≤ 240 HB	150	0,017	0,025	0,034	0,050	0,060	0,080	0,100	190	0,021	0,032	0,042	0,063	0,075	0,100	0,125			
N	≥ 7 % Si	340	0,018	0,027	0,036	0,055	0,066	0,088	0,110	440	0,023	0,034	0,045	0,069	0,083	0,110	0,138			

SuperF-UT-Fräser

SuperF-UT-Fräser NX-3

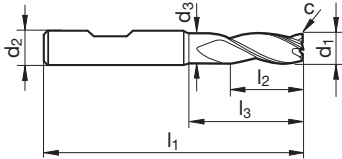


Katalog-Nr. 54587



P	M	K	N	S	H
•	•	•	•	•	

Arbeitsrichtwerte
Seite 280-293



- angepasste Stir- und Nutengeometrie für höchste Schnittwerte und sehr gute Spanabfuhr
- extrem steile Tauchwinkel bis 45° möglich
- hohe Standzeiten durch hochharte Beschichtung
- 3-Schneider mit vergrößerten Spanräumen
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,800	57,000	8,000	15,000	0,050	3	3,000
3,500	6,000	3,300	57,000	10,000	15,000	0,050	3	3,500
3,700	6,000	3,500	57,000	11,000	15,000	0,060	3	3,700
4,000	6,000	3,800	57,000	11,000	18,000	0,060	3	4,000
4,500	6,000	4,300	57,000	11,000	18,000	0,070	3	4,500
4,700	6,000	4,500	57,000	13,000	18,000	0,070	3	4,700
5,000	6,000	4,800	57,000	13,000	18,000	0,080	3	5,000
5,500	6,000	5,300	57,000	13,000	19,400	0,080	3	5,500
5,700	6,000	5,500	57,000	13,000	19,600	0,090	3	5,700
6,000	6,000	5,700	57,000	13,000	20,000	0,090	3	6,000
6,500	8,000	6,200	63,000	16,000	24,400	0,100	3	6,500
7,000	8,000	6,700	63,000	16,000	24,900	0,110	3	7,000
7,500	8,000	7,200	63,000	19,000	25,300	0,110	3	7,500
8,000	8,000	7,700	63,000	19,000	26,000	0,120	3	8,000
8,500	10,000	8,200	72,000	19,000	29,400	0,130	3	8,500
9,000	10,000	8,700	72,000	19,000	29,900	0,140	3	9,000
9,500	10,000	9,200	72,000	22,000	30,300	0,140	3	9,500
10,000	10,000	9,500	72,000	22,000	30,000	0,150	3	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,180	3	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,190	3	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,240	3	20,000

Fräswerkzeuge

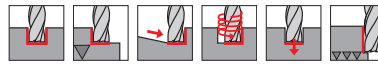
ISO	Härte	v _c	f _z (mm/z)/Ø							f _z (mm/z)/Ø									
			3	6	8	10	12	16	20	3	6	8	10	12	16	20			
P	≤ 850 N/mm ²	270	0,017	0,025	0,034	0,050	0,060	0,080	0,100		a _e = 1,0xD	350	0,021	0,032	0,042	0,063	0,075	0,100	0,125
	≥ 850 N/mm ²	180	0,014	0,021	0,028	0,045	0,054	0,072	0,090			260	0,018	0,027	0,036	0,059	0,070	0,094	0,117
M	≤ 750 N/mm ²	120	0,014	0,021	0,028	0,045	0,054	0,072	0,090		a _{e max} = 0,33xD	160	0,018	0,027	0,036	0,059	0,070	0,094	0,117
	≥ 750 N/mm ²	80	0,013	0,019	0,026	0,040	0,048	0,064	0,080			120	0,019	0,029	0,038	0,060	0,072	0,096	0,120
S	Ti-Basis	60	0,013	0,019	0,026	0,040	0,048	0,064	0,080	110	0,017	0,025	0,033	0,052	0,062	0,083	0,104		
K	≤ 240 HB	150	0,017	0,025	0,034	0,050	0,060	0,080	0,100	190	0,021	0,032	0,042	0,063	0,075	0,100	0,125		
N	≥ 7 % Si	340	0,018	0,027	0,036	0,055	0,066	0,088	0,110	440	0,023	0,034	0,045	0,069	0,083	0,110	0,138		

SuperF-UT-Fräser

SuperF-UT-Fräser NX



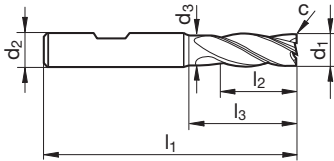
Katalog-Nr. 54589



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- kurze stabile Ausführung
- angepasste Stirn- und Nutengeometrie für höchste Schnittwerte und sehr gute Spanabfuhr
- extrem steile Tauchwinkel bis 45° möglich
- hohe Standzeiten durch hochharte Beschichtung
- hohe Prozesssicherheit bei gleichzeitiger Reduzierung der Bearbeitungszeiten
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,800	50,000	5,000	12,000	0,030	4	3,000
3,700	6,000	3,500	54,000	8,000	12,000	0,040	4	3,700
4,000	6,000	3,800	54,000	8,000	15,000	0,040	4	4,000
4,700	6,000	4,500	54,000	9,000	15,000	0,050	4	4,700
5,000	6,000	4,800	54,000	9,000	15,000	0,050	4	5,000
5,700	6,000	5,500	54,000	10,000	16,600	0,060	4	5,700
6,000	6,000	5,700	54,000	10,000	17,000	0,060	4	6,000
7,000	8,000	6,700	58,000	11,000	19,900	0,070	4	7,000
7,700	8,000	7,400	58,000	12,000	20,500	0,080	4	7,700
8,000	8,000	7,700	58,000	12,000	21,000	0,080	4	8,000
9,000	10,000	8,700	66,000	13,000	23,900	0,090	4	9,000
9,700	10,000	9,400	66,000	14,000	24,500	0,100	4	9,700
10,000	10,000	9,500	66,000	14,000	24,000	0,100	4	10,000
11,700	12,000	11,200	73,000	16,000	25,300	0,120	4	11,700
12,000	12,000	11,500	73,000	16,000	26,000	0,120	4	12,000
15,600	16,000	15,100	82,000	22,000	31,200	0,160	4	15,600
16,000	16,000	15,500	82,000	22,000	32,000	0,160	4	16,000
19,000	20,000	18,500	92,000	26,000	38,700	0,190	4	19,000
20,000	20,000	19,500	92,000	26,000	40,000	0,200	4	20,000

Fräswerkzeuge

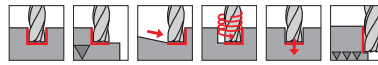
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø							
			3	6	8	10	12	16	20		3	6	8	10	12	16	20	
P	≤ 850 N/mm ²	270	0,017	0,025	0,034	0,050	0,060	0,080	0,100	HPC	450	0,027	0,040	0,054	0,080	0,10	0,13	0,16
	≥ 850 N/mm ²	180	0,014	0,021	0,028	0,045	0,054	0,072	0,090		300	0,022	0,034	0,045	0,072	0,09	0,12	0,14
M	≤ 750 N/mm ²	120	0,014	0,021	0,028	0,045	0,054	0,072	0,090	HPC	200	0,022	0,034	0,045	0,072	0,09	0,12	0,14
	≥ 750 N/mm ²	80	0,013	0,019	0,026	0,040	0,048	0,064	0,080		140	0,020	0,031	0,041	0,064	0,08	0,10	0,13
S	Ti-Basis	60	0,013	0,019	0,026	0,040	0,048	0,064	0,080	110	0,020	0,031	0,041	0,064	0,08	0,10	0,13	
K	≤ 240 HB	150	0,017	0,025	0,034	0,050	0,060	0,080	0,100	250	0,027	0,040	0,054	0,080	0,10	0,13	0,16	
N	≥ 7 % Si	340	0,018	0,027	0,036	0,055	0,066	0,088	0,110	570	0,029	0,043	0,058	0,088	0,11	0,14	0,18	

SuperF-UT-Fräser

SuperF-UT-Fräser NX-IK



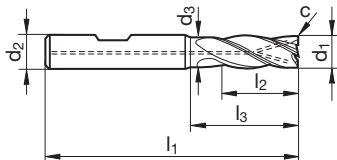
Katalog-Nr. 54585



P	M	K	N	S	H
•	•	•	•	•	

Arbeitsrichtwerte
Seite 280-293

- angepasste Schneidengeometrie und Beschichtung
- mit Innenkühlung: radiale und axiale Austritte
- extrem steile Tauchwinkel bis 45° möglich
- hohe Standzeiten durch hochharte Beschichtung
- hohe Prozesssicherheit bei gleichzeitiger Reduzierung der Bearbeitungszeiten
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
6,000	6,000	5,700	57,000	13,000	20,000	0,060	4	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,080	4	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	4	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,120	4	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,160	4	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,200	4	20,000
25,000	25,000	24,000	121,000	45,000	63,000	0,250	4	25,000

Fräswerkzeuge

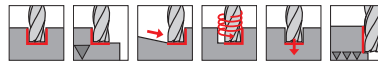
ISO	Härte	v _c	f _z (mm/z)/Ø						f _z (mm/z)/Ø								
			4	6	8	10	12	20	4	6	8	10	12	16	20		
P	≤ 850 N/mm ²	270	0,017	0,025	0,034	0,050	0,060	0,080	0,100	270	0,014	0,021	0,028	0,040	0,048	0,064	0,080
	≥ 850 N/mm ²	180	0,014	0,021	0,028	0,045	0,054	0,072	0,090	180	0,008	0,012	0,016	0,025	0,030	0,040	0,050
M	≤ 750 N/mm ²	120	0,014	0,021	0,028	0,045	0,054	0,072	0,090	90	0,007	0,011	0,014	0,023	0,027	0,036	0,045
	≥ 750 N/mm ²	80	0,013	0,019	0,026	0,040	0,048	0,064	0,080	60	0,006	0,010	0,013	0,020	0,024	0,032	0,040
S	Ti-Basis	60	0,013	0,019	0,026	0,040	0,048	0,064	0,080	50	0,006	0,010	0,013	0,020	0,024	0,032	0,040
K	≤ 240 HB	150	0,017	0,025	0,034	0,050	0,060	0,080	0,100	150	0,014	0,021	0,028	0,040	0,048	0,064	0,080
N	≥ 7 % Si	340	0,018	0,027	0,036	0,055	0,066	0,088	0,110	340	0,014	0,021	0,028	0,040	0,048	0,064	0,080

SuperF-UT-Fräser

SuperF-UT-Fräser NX Micro



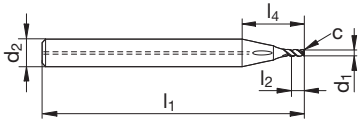
Katalog-Nr. 54594



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- für extreme Schnittwerte und Zerspanleistung
- mit Innenkühlung: Peripheriekühlung 4 bzw. 6 Austritte
- Zentrumschnitt
- verbesserte Stirngeometrie
- Schneidlänge 2,5xD



d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	c mm x 45°	Z	Code-Nr.
0,500	4,000	38,000	1,250	9,300	0,010	3	0,500
0,750	4,000	38,000	1,875	9,300	0,015	3	0,750
0,800	4,000	38,000	2,000	9,300	0,016	3	0,800
1,000	4,000	38,000	2,500	9,300	0,020	3	1,000
1,200	4,000	38,000	3,000	9,400	0,024	3	1,200
1,500	4,000	45,000	3,750	9,800	0,030	3	1,500
1,800	4,000	45,000	4,500	10,300	0,036	3	1,800
2,000	6,000	50,000	5,000	14,700	0,040	3	2,000
2,200	6,000	50,000	5,500	14,900	0,044	3	2,200
2,500	6,000	50,000	6,250	15,300	0,050	3	2,500
2,800	6,000	50,000	7,000	15,900	0,056	3	2,800
3,000	6,000	50,000	7,500	16,200	0,060	3	3,000

Fräserwerkzeuge

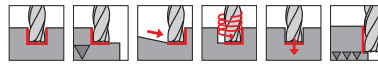
ISO	Härte	a _p											a _e	a _p										
			Ø1,0		Ø1,5		Ø2,0		Ø2,5		Ø3,0				Ø1,0		Ø1,5		Ø2,0		Ø2,5		Ø3,0	
			v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z			v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z
P	≤850 N/mm ²	1,00xØ	140	0,009	168	0,014	182	0,018	182	0,023	196	0,027	0,25xØ	2,0xØ	170	0,014	204	0,021	221	0,028	221	0,035	238	0,043
	≥850 N/mm ²	0,75xØ	140	0,006	168	0,009	182	0,012	182	0,015	196	0,018	0,20xØ	2,0xØ	170	0,009	204	0,014	221	0,019	221	0,024	238	0,028
M	≤750 N/mm ²	1,00xØ	140	0,008	168	0,012	182	0,016	182	0,020	196	0,024	0,25xØ	2,0xØ	170	0,013	204	0,019	221	0,025	221	0,032	238	0,038
	≥750 N/mm ²	0,75xØ	90	0,006	108	0,009	117	0,012	117	0,015	126	0,018	0,20xØ	2,0xØ	105	0,010	126	0,014	137	0,019	137	0,024	147	0,029
S	Ni-Basis	0,50xØ	60	0,004	72	0,005	78	0,007	78	0,009	84	0,011	0,15xØ	2,0xØ	70	0,006	84	0,009	91	0,012	91	0,014	98	0,017
	Ti-Basis	0,75xØ	100	0,008	120	0,011	130	0,015	130	0,019	140	0,023	0,20xØ	2,0xØ	115	0,012	138	0,018	150	0,024	150	0,030	161	0,035
K	≤240 HB	1,00xØ	120	0,007	144	0,011	156	0,014	156	0,018	168	0,021	0,25xØ	2,0xØ	145	0,011	174	0,017	189	0,022	189	0,028	203	0,033
	≥240 HB	1,00xØ	100	0,006	120	0,009	130	0,012	130	0,016	140	0,019	0,25xØ	2,0xØ	120	0,010	144	0,015	156	0,020	156	0,024	168	0,029
N	Al	1,00xØ	170	0,012	204	0,018	221	0,024	221	0,030	238	0,036	0,25xØ	2,0xØ	200	0,019	240	0,028	260	0,038	260	0,047	280	0,057
	NE	1,00xØ	125	0,011	150	0,017	162,5	0,022	162,5	0,028	175	0,033	0,25xØ	2,0xØ	150	0,017	180	0,026	195	0,035	195	0,044	210	0,052

SuperF-UT-Fräser

SuperF-UT-Fräser NX Micro



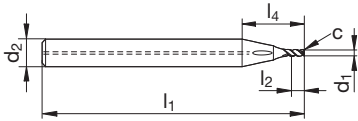
Katalog-Nr. 54595



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- für extreme Schnittwerte und Zerspanleistung
- mit Innenkühlung: Peripheriekühlung 4 bzw. 6 Austritte
- Zentrumschnitt
- verbesserte Stirngeometrie
- Schneidlänge 5xD



d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	c mm x 45°	Z	Code-Nr.
0,500	4,000	38,000	2,500	10,600	0,010	3	0,500
0,750	4,000	38,000	3,750	11,200	0,015	3	0,750
0,790	4,000	38,000	3,950	11,300	0,016	3	0,790
0,800	4,000	38,000	4,000	11,300	0,016	3	0,800
1,000	4,000	45,000	5,000	11,800	0,020	3	1,000
1,500	4,000	50,000	7,500	13,500	0,030	3	1,500
2,000	6,000	57,000	10,000	19,700	0,040	3	2,000
2,500	6,000	57,000	12,500	21,600	0,050	3	2,500
3,000	6,000	57,000	15,000	23,700	0,060	3	3,000

Fräswerkzeuge

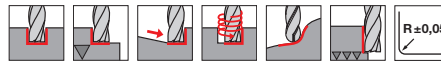
ISO	Härte	a _p											a _e	a _p										
			Ø1,0		Ø1,5		Ø2,0		Ø2,5		Ø3,0				Ø1,0		Ø1,5		Ø2,0		Ø2,5		Ø3,0	
			v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z			v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z
P	≤850N/mm ²	0,50xØ	112	0,008	134	0,012	146	0,016	146	0,020	157	0,024	0,10xØ	5,0xØ	134	0,013	161	0,019	174	0,026	174	0,032	188	0,038
	≥850N/mm ²	0,25xØ	112	0,005	134	0,008	146	0,011	146	0,014	157	0,016	0,08xØ	5,0xØ	134	0,009	161	0,013	174	0,017	174	0,021	188	0,026
M	≤750N/mm ²	0,25xØ	112	0,007	134	0,011	146	0,014	146	0,018	157	0,022	0,10xØ	5,0xØ	134	0,011	161	0,017	174	0,023	174	0,028	188	0,034
	≥750N/mm ²	0,25xØ	71	0,006	85	0,008	92	0,011	92	0,014	99	0,017	0,05xØ	5,0xØ	86	0,009	103	0,013	112	0,017	112	0,022	120	0,026
S	Ni-Basis	0,25xØ	46	0,003	55	0,005	60	0,007	60	0,008	64	0,010	0,05xØ	5,0xØ	55	0,005	66	0,008	72	0,010	72	0,013	77	0,016
	Ti-Basis	0,25xØ	72	0,007	86	0,010	94	0,014	94	0,017	101	0,020	0,08xØ	5,0xØ	86	0,011	103	0,016	112	0,021	112	0,027	120	0,032
K	≤240HB	0,50xØ	96	0,006	115	0,009	125	0,013	125	0,016	134	0,019	0,10xØ	5,0xØ	115	0,010	138	0,015	150	0,020	150	0,025	161	0,030
	≥240HB	0,50xØ	80	0,006	96	0,008	104	0,011	104	0,014	112	0,017	0,10xØ	5,0xØ	96	0,009	115	0,013	125	0,018	125	0,022	134	0,026
N	Al	0,50xØ	136	0,011	163	0,016	177	0,022	177	0,027	190	0,032	0,15xØ	5,0xØ	163	0,017	196	0,026	212	0,034	212	0,043	228	0,051
	NE	0,50xØ	100	0,010	120	0,015	130	0,020	130	0,025	140	0,030	0,12xØ	5,0xØ	120	0,016	144	0,023	156	0,031	156	0,039	168	0,047

SuperF-UT-Fräser

SuperF-UT-Fräser Ti



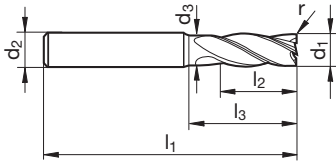
Katalog-Nr. 54560



P	M	K	N	S	H
●	●			●	

Arbeitsrichtwerte
Seite 280-293

- optimierte Schneidkantenausführung für hochfeste Titanlegierungen und Sonderwerkstoffe
- mit definierten Eckradien
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



Fräswerkzeuge

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
6,000	6,000	5,700	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,700	57,000	13,000	20,000	0,800	4	6,008
6,000	6,000	5,700	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,700	57,000	13,000	20,000	1,500	4	6,015
6,000	6,000	5,700	57,000	13,000	20,000	2,000	4	6,020
8,000	8,000	7,700	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,700	63,000	19,000	26,000	0,800	4	8,008
8,000	8,000	7,700	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,700	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,700	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,500	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,500	72,000	22,000	30,000	0,800	4	10,008
10,000	10,000	9,500	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,500	72,000	22,000	30,000	2,000	4	10,020
12,000	12,000	11,500	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,500	83,000	26,000	36,000	0,800	4	12,008
12,000	12,000	11,500	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	4	12,030
12,000	12,000	11,500	83,000	26,000	36,000	4,000	4	12,040
16,000	16,000	15,500	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,500	92,000	32,000	42,000	0,800	4	16,008
16,000	16,000	15,500	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,500	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,500	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,500	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,500	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,500	104,000	38,000	52,000	4,000	4	20,040

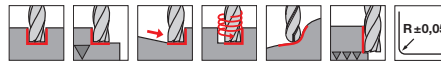
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23		270	0,015	0,030	0,040	0,055	0,07	0,09
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18		120	0,011	0,021	0,028	0,040	0,05	0,06
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21		120	0,013	0,026	0,035	0,050	0,06	0,08
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28		460	0,018	0,036	0,048	0,066	0,08	0,11

SuperF-UT-Fräser

SuperF-UT-Fräser Ti



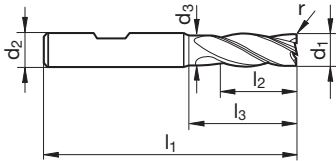
Katalog-Nr. 54561



P	M	K	N	S	H
●	●			●	

Arbeitsrichtwerte
Seite 280-293

- optimierte Schneidkantenausführung für hochfeste Titanlegierungen und Sonderwerkstoffe
- mit definierten Eckradien
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
6,000	6,000	5,700	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,700	57,000	13,000	20,000	0,800	4	6,008
6,000	6,000	5,700	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,700	57,000	13,000	20,000	1,500	4	6,015
6,000	6,000	5,700	57,000	13,000	20,000	2,000	4	6,020
8,000	8,000	7,700	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,700	63,000	19,000	26,000	0,800	4	8,008
8,000	8,000	7,700	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,700	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,700	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,500	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,500	72,000	22,000	30,000	0,800	4	10,008
10,000	10,000	9,500	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,500	72,000	22,000	30,000	2,000	4	10,020
12,000	12,000	11,500	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,500	83,000	26,000	36,000	0,800	4	12,008
12,000	12,000	11,500	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	4	12,030
12,000	12,000	11,500	83,000	26,000	36,000	4,000	4	12,040
16,000	16,000	15,500	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,500	92,000	32,000	42,000	0,800	4	16,008
16,000	16,000	15,500	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,500	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,500	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,500	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,500	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,500	104,000	38,000	52,000	4,000	4	20,040

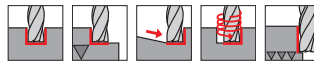
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø								
			3	6	8	10	12	16	20		3	6	8	10	12	16	20		
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28		a _p max = 0,10xD	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23			270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23		a _p max = 0,02xD	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18			120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15		a _p max = 0,02xD	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21			120	0,013	0,026	0,035	0,050	0,06	0,08	0,10
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37		a _p max = 0,02xD	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28			460	0,018	0,036	0,048	0,066	0,08	0,11	0,13

SuperF-UT-Fräser

SuperF-UT-Fräser H-X



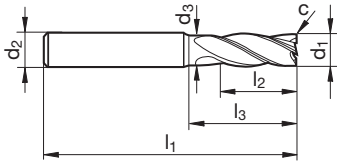
Katalog-Nr. 54340



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- Nuten bis max. 65 HRC
- Halsfreischliff
- Zentrumschnitt



d1 f9 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	12,000	0,060	4	3,000
4,000	6,000	3,800	57,000	11,000	15,000	0,080	4	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,120	4	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,160	4	8,000
10,000	10,000	9,500	72,000	22,000	31,000	0,200	4	10,000
12,000	12,000	11,500	83,000	26,000	37,000	0,240	4	12,000
16,000	16,000	15,500	92,000	32,000	43,000	0,320	4	16,000
20,000	20,000	19,500	104,000	38,000	53,000	0,400	4	20,000

Fräswerkzeuge

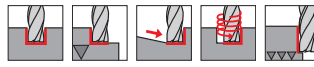
ISO	Härte	v _c	f _z (mm/z)/Ø							f _z (mm/z)/Ø							
			3	6	8	10	12	16	20	3	6	8	10	12	16	20	
P	≥ 1000 N/mm ²	270	0,034	0,068	0,090	0,125	0,15	0,20	0,25	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
K	≥ 300 HB	280	0,038	0,075	0,100	0,138	0,17	0,22	0,28	280	0,017	0,033	0,044	0,061	0,07	0,10	0,12
H	≤ 55 HRC	140	0,026	0,053	0,070	0,100	0,12	0,16	0,20	140	0,011	0,021	0,028	0,040	0,05	0,06	0,08
	≥ 55 HRC	80	0,021	0,042	0,056	0,075	0,09	0,12	0,15	100	0,008	0,015	0,020	0,027	0,03	0,04	0,05

SuperF-UT-Fräser

SuperF-UT-Fräser H-X



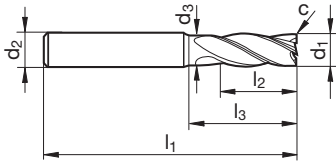
Katalog-Nr. 54341



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- Nuten bis max. 65 HRC
- Halsfreischliff
- Zentrumschnitt



d1 f9 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	12,000	0,060	4	3,000
4,000	6,000	3,800	57,000	11,000	15,000	0,080	4	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,120	4	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,160	4	8,000
10,000	10,000	9,500	72,000	22,000	31,000	0,200	4	10,000
12,000	12,000	11,500	83,000	26,000	37,000	0,240	4	12,000
16,000	16,000	15,500	92,000	32,000	43,000	0,320	4	16,000
20,000	20,000	19,500	104,000	38,000	53,000	0,400	4	20,000

Fräswerkzeuge

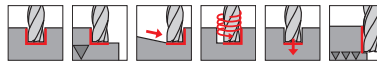
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≥ 1000 N/mm ²	270	0,034	0,068	0,090	0,125	0,15	0,20	0,25	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
K	≥ 300 HB	280	0,038	0,075	0,100	0,138	0,17	0,22	0,28	280	0,017	0,033	0,044	0,061	0,07	0,10	0,12
H	≤ 55 HRC	140	0,026	0,053	0,070	0,100	0,12	0,16	0,20	140	0,011	0,021	0,028	0,040	0,05	0,06	0,08
	≥ 55 HRC	80	0,021	0,042	0,056	0,075	0,09	0,12	0,15	100	0,008	0,015	0,020	0,027	0,03	0,04	0,05

SuperF-UT-Fräser

SuperF-UT-Fräser S



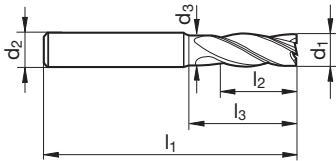
Katalog-Nr. 54556



P	M	K	N	S	H
○	○	○	○	○	

Arbeitsrichtwerte
Seite 280-293

- ohne Eckenschutzfase
- zum Feinstschlichten
- bis 1600 N/mm²
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- HB Spannfläche auf Anfrage möglich



Fräserzeuge

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	Z	Code-Nr.
3,000	6,000	2,800	57,000	8,000	15,000	4	3,000
4,000	6,000	3,800	57,000	11,000	18,000	4	4,000
5,000	6,000	4,800	57,000	13,000	18,000	4	5,000
6,000	6,000	5,700	57,000	13,000	20,000	4	6,000
8,000	8,000	7,700	63,000	19,000	26,000	4	8,000
10,000	10,000	9,500	72,000	22,000	30,000	4	10,000
12,000	12,000	11,500	83,000	26,000	36,000	4	12,000
16,000	16,000	15,500	92,000	32,000	42,000	4	16,000
20,000	20,000	19,500	104,000	38,000	52,000	4	20,000

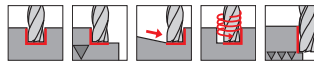
ISO	Härte	v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20
P	≤ 850 N/mm ²	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	120	0,013	0,026	0,035	0,050	0,06	0,08	0,10

SuperF-UT-Fräser

SuperF-UT-Fräser N²



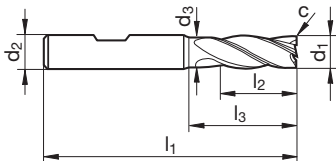
Katalog-Nr. 64552



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 280-293

- sehr großes Materialspektrum = universeller Einsatzbereich
- extrem hohe Standzeiten durch hochharte TiAlZrN-Beschichtung
- bis 1600 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- auch als Satz 78883 1,00 erhältlich



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,800	57,000	8,000	15,000	0,100	4	3,000
4,000	6,000	3,800	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,450	4	20,000
25,000	25,000	24,000	121,000	45,000	63,000	0,600	4	25,000

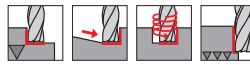
ISO	Härte	v _c	f _z (mm/z)/Ø						f _z (mm/z)/Ø								
			3	6	8	10	12	16	20	3	6	8	10	12	16	20	
P	≤ 850 N/mm ²	180	0,016	0,031	0,042	0,060	0,07	0,10	0,12	305	0,025	0,050	0,067	0,096	0,12	0,15	0,19
	≥ 850 N/mm ²	135	0,014	0,027	0,036	0,050	0,06	0,08	0,10		230	0,022	0,043	0,058	0,080	0,10	0,13
K	≤ 240 HB	160	0,017	0,033	0,044	0,065	0,08	0,10	0,13	270	0,026	0,053	0,070	0,104	0,12	0,17	0,21
	≥ 240 HB	140	0,015	0,030	0,040	0,055	0,07	0,09	0,11		240	0,024	0,048	0,064	0,088	0,11	0,14

SuperF-UT-Fräser

SuperF-UT-Fräser NL



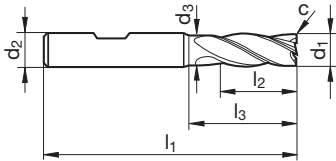
Katalog-Nr. 54553



P	M	K	N	S	H
●	○	●	○	○	○

Arbeitsrichtwerte
Seite 280-293

- universell einsetzbar
- bis 1600 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt
- HSC Schichten bis 4xD Schneidenlänge
- ungleiche Teilung, gleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
6,000	6,000	5,700	65,000	24,000	28,000	0,120	4	6,000
8,000	8,000	7,700	75,000	32,000	38,000	0,160	4	8,000
10,000	10,000	9,500	100,000	40,000	58,000	0,200	4	10,000
12,000	12,000	11,500	100,000	48,000	53,000	0,240	4	12,000
16,000	16,000	15,500	125,000	64,000	75,000	0,320	4	16,000
20,000	20,000	19,500	150,000	80,000	98,000	0,400	4	20,000
25,000	25,000	24,000	175,000	100,000	117,000	0,500	4	25,000

Fräswerkzeuge

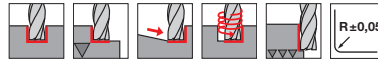
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	130	0,013	0,025	0,012	0,048	0,06	0,08	0,10	160	0,009	0,017	0,023	0,033	0,04	0,05	0,07
	≥ 850 N/mm ²	100	0,011	0,022	0,029	0,040	0,05	0,06	0,08	120	0,007	0,015	0,020	0,028	0,03	0,04	0,06
K	≤ 240 HB	120	0,013	0,027	0,035	0,052	0,06	0,08	0,10	140	0,009	0,018	0,024	0,036	0,04	0,06	0,07
	≥ 240 HB	100	0,012	0,024	0,032	0,044	0,05	0,07	0,09	120	0,008	0,017	0,022	0,030	0,04	0,05	0,06

SuperF-UT-Fräser

SuperF-UT-Fräser N-r



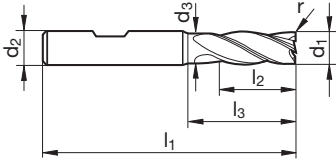
Katalog-Nr. 54550




P	M	K	N	S	H
●	○		●	●	

Arbeitsrichtwerte
Seite 280-293

- sehr großes Materialspektrum = universeller Einsatzbereich
- optimiert für Fräsoperationen im HPC und HSC Bereich
- mit definierten Eckradien
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	15,000	0,200	4	3,002
3,000	6,000	2,800	57,000	8,000	15,000	0,500	4	3,005
4,000	6,000	3,800	57,000	11,000	18,000	0,200	4	4,002
4,000	6,000	3,800	57,000	11,000	18,000	0,500	4	4,005
4,000	6,000	3,800	57,000	11,000	18,000	1,000	4	4,010
5,000	6,000	4,800	57,000	13,000	18,000	0,200	4	5,002
5,000	6,000	4,800	57,000	13,000	18,000	0,500	4	5,005
5,000	6,000	4,800	57,000	13,000	18,000	1,000	4	5,010
6,000	6,000	5,700	57,000	13,000	20,000	0,200	4	6,002
6,000	6,000	5,700	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,700	57,000	13,000	20,000	1,500	4	6,015
8,000	8,000	7,700	63,000	19,000	26,000	0,300	4	8,003
8,000	8,000	7,700	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,700	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,700	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,500	72,000	22,000	30,000	0,300	4	10,003
10,000	10,000	9,500	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,500	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,500	72,000	22,000	30,000	2,000	4	10,020
10,000	10,000	9,500	72,000	22,000	30,000	2,500	4	10,025
12,000	12,000	11,500	83,000	26,000	36,000	0,300	4	12,003
12,000	12,000	11,500	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,500	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	4	12,030
16,000	16,000	15,500	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,500	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,500	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,500	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,500	104,000	38,000	52,000	0,500	4	20,005
20,000	20,000	19,500	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,500	104,000	38,000	52,000	1,500	4	20,015
20,000	20,000	19,500	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,500	104,000	38,000	52,000	2,500	4	20,025
20,000	20,000	19,500	104,000	38,000	52,000	3,000	4	20,030
20,000	20,000	19,500	104,000	38,000	52,000	4,000	4	20,040

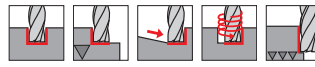
ISO	Härte	v_c	f_z (mm/z)/ \emptyset							v_c	f_z (mm/z)/ \emptyset						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
			$a_p = 1,0xD$								$a_p = 1,0xD$			$a_e \text{ max} = 0,75xD$			
P	$\leq 850 \text{ N/mm}^2$	180	0,016	0,031	0,042	0,060	0,07	0,10	0,12	210	0,018	0,036	0,048	0,069	0,08	0,11	0,14
	$\geq 850 \text{ N/mm}^2$	135	0,014	0,027	0,036	0,050	0,06	0,08	0,10	160	0,016	0,031	0,041	0,058	0,07	0,09	0,12
M	$\leq 750 \text{ N/mm}^2$	120	0,014	0,027	0,036	0,050	0,06	0,08	0,10	140	0,016	0,031	0,041	0,058	0,07	0,09	0,12
	$\geq 750 \text{ N/mm}^2$	60	0,011	0,021	0,028	0,040	0,05	0,06	0,08	80	0,013	0,025	0,034	0,048	0,06	0,08	0,10
S	Ni-Basis	30	0,008	0,017	0,022	0,032	0,04	0,05	0,06	40	0,010	0,020	0,027	0,038	0,05	0,06	0,08
	Ti-Basis	60	0,012	0,024	0,032	0,045	0,05	0,07	0,09	80	0,014	0,029	0,038	0,054	0,06	0,09	0,11
N	$\leq 5\% \text{ Si}$	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	600	0,022	0,045	0,060	0,092	0,11	0,15	0,18
	$\geq 5\% \text{ Si}$	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12	300	0,019	0,038	0,051	0,069	0,08	0,11	0,14

SuperF-UT-Fräser

SuperF-UT-Fräser U



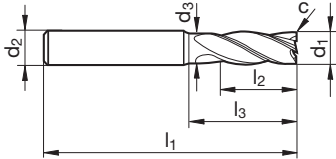
Katalog-Nr. 54500



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- speziell für weich-zähe und hochlegierte Werkstoffe
- längere Schneide als DIN 6527 L
- Halsfreischliff
- Zentrumschnitt



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
1,000	4,000	0,920	50,000	3,000	4,000	0,020	4	1,000
1,500	4,000	1,400	50,000	4,500	6,000	0,030	4	1,500
2,000	6,000	1,850	50,000	6,000	8,000	0,040	4	2,000
2,500	6,000	2,350	50,000	7,500	10,000	0,050	4	2,500
3,000	6,000	2,850	57,000	10,000	15,000	0,060	4	3,000
4,000	6,000	3,800	57,000	14,000	18,000	0,080	4	4,000
5,000	6,000	4,800	57,000	15,000	20,000	0,100	4	5,000
6,000	6,000	5,700	57,000	16,000	20,000	0,120	4	6,000
8,000	8,000	7,700	63,000	21,000	26,000	0,160	4	8,000
10,000	10,000	9,500	72,000	25,000	31,000	0,200	4	10,000
12,000	12,000	11,500	83,000	28,000	37,000	0,240	4	12,000
14,000	14,000	13,500	83,000	28,000	37,000	0,280	4	14,000
16,000	16,000	15,500	92,000	36,000	43,000	0,320	4	16,000
20,000	20,000	19,500	104,000	41,000	53,000	0,400	4	20,000

Fräswerkzeuge

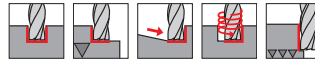
ISO	Härte	v _c	f _z (mm/z)/Ø								v _c	f _z (mm/z)/Ø							
			1	3	6	8	10	12	16	20		1	3	6	8	10	12	16	20
P	< 500 N/mm ² 500-900 N/mm ²	180	a _p = 1,0xD				a _e = 1,0xD				210	a _p = 1,0xD				a _e max = 0,6xD			
			0,010	0,016	0,030	0,042	0,06	0,072	0,1	0,12		0,011	0,018	0,036	0,048	0,069	0,08	0,11	0,14
M	< 500 N/mm ² 500-900 N/mm ²	120	a _p = 1,0xD				a _e = 1,0xD				140	a _p = 1,0xD				a _e max = 0,6xD			
			0,008	0,014	0,027	0,036	0,05	0,06	0,08	0,1		0,009	0,016	0,031	0,041	0,058	0,07	0,09	0,12
S	< 900 N/mm ²	80	a _p = 1,0xD				a _e = 1,0xD				100	a _p = 1,0xD				a _e max = 0,6xD			
			0,006	0,012	0,025	0,032	0,045	0,055	0,075	0,085		0,007	0,016	0,031	0,041	0,058	0,07	0,09	0,12
N	> 250 N/mm ²	45	a _p = 1,0xD				a _e = 1,0xD				60	a _p = 1,0xD				a _e max = 0,6xD			
			0,005	0,010	0,021	0,028	0,04	0,048	0,06	0,07		0,006	0,013	0,025	0,034	0,048	0,06	0,08	0,1
N	> 250 N/mm ²	350	a _p = 1,0xD				a _e = 1,0xD				600	a _p = 1,0xD				a _e max = 0,6xD			
			0,004	0,008	0,016	0,022	0,032	0,04	0,05	0,065		0,005	0,010	0,020	0,027	0,038	0,05	0,06	0,085
N	> 250 N/mm ²	350	a _p = 1,0xD				a _e = 1,0xD				600	a _p = 1,0xD				a _e max = 0,6xD			
			0,012	0,020	0,038	0,05	0,08	0,095	0,13	0,16		0,013	0,022	0,045	0,06	0,09	0,012	0,15	0,18

SuperF-UT-Fräser

SuperF-UT-Fräser U



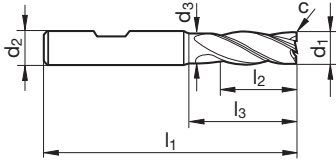
Katalog-Nr. 54501



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- speziell für weich-zähe und hochlegierte Werkstoffe
- längere Schneide als DIN 6527 L
- Halsfreischliff
- Zentrumschnitt



Fräswerkzeuge

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
4,000	6,000	3,800	57,000	14,000	18,000	0,080	4	4,000
5,000	6,000	4,800	57,000	15,000	20,000	0,100	4	5,000
6,000	6,000	5,700	57,000	16,000	20,000	0,120	4	6,000
8,000	8,000	7,700	63,000	21,000	26,000	0,160	4	8,000
10,000	10,000	9,500	72,000	25,000	31,000	0,200	4	10,000
12,000	12,000	11,500	83,000	28,000	37,000	0,240	4	12,000
14,000	14,000	13,500	83,000	28,000	37,000	0,280	4	14,000
16,000	16,000	15,500	92,000	36,000	43,000	0,320	4	16,000
20,000	20,000	19,500	104,000	41,000	53,000	0,400	4	20,000

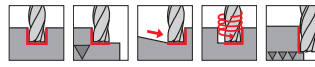
ISO	Härte	v _c	f _z (mm/z)/Ø								v _c	f _z (mm/z)/Ø							
			1	3	6	8	10	12	16	20		1	3	6	8	10	12	16	20
P	< 500 N/mm ²	180	0,010	0,016	0,030	0,042	0,06	0,072	0,1	0,12	210	0,011	0,018	0,036	0,048	0,069	0,08	0,11	0,14
	500-900 N/mm ²	140	0,008	0,014	0,027	0,036	0,05	0,06	0,08	0,1	160	0,009	0,016	0,031	0,041	0,058	0,07	0,09	0,12
M	< 500 N/mm ²	120	0,006	0,012	0,025	0,032	0,045	0,055	0,075	0,085	140	0,007	0,016	0,031	0,041	0,058	0,07	0,09	0,12
	500-900 N/mm ²	80	0,005	0,010	0,021	0,028	0,04	0,048	0,06	0,07	100	0,006	0,013	0,025	0,034	0,048	0,06	0,08	0,1
S	< 900 N/mm ²	45	0,004	0,008	0,016	0,022	0,032	0,04	0,05	0,065	60	0,005	0,010	0,020	0,027	0,038	0,05	0,06	0,085
N	> 250 N/mm ²	350	0,012	0,020	0,038	0,05	0,08	0,095	0,13	0,16	600	0,013	0,022	0,045	0,06	0,09	0,012	0,15	0,18

SuperF-UT-Fräser

SuperF-UT-Fräser UL



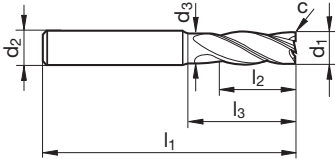
Katalog-Nr. 54502



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 280-293

- speziell für weich-zähe und hochlegierte Werkstoffe
- mittellange Ausführung
- Halsfreischliff
- Zentrumschnitt



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
1,000	4,000	0,920	50,000	3,000	5,500	0,020	4	1,000
1,500	4,000	1,400	50,000	4,500	8,500	0,030	4	1,500
2,000	6,000	1,850	57,000	6,000	11,500	0,040	4	2,000
2,500	6,000	2,350	57,000	7,500	14,500	0,050	4	2,500
3,000	6,000	2,850	65,000	10,000	20,000	0,060	4	3,000
4,000	6,000	3,800	65,000	14,000	27,000	0,080	4	4,000
5,000	6,000	4,800	65,000	15,000	28,000	0,100	4	5,000
6,000	6,000	5,700	75,000	19,000	38,000	0,120	4	6,000
8,000	8,000	7,700	80,000	21,000	43,000	0,160	4	8,000
10,000	10,000	9,500	93,000	26,000	52,000	0,200	4	10,000
12,000	12,000	11,500	100,000	28,000	54,000	0,240	4	12,000
14,000	14,000	13,500	100,000	28,000	54,000	0,280	4	14,000
16,000	16,000	15,500	123,000	38,000	74,000	0,320	4	16,000
20,000	20,000	19,500	126,000	41,000	75,000	0,400	4	20,000

Fräswerkzeuge

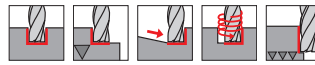
ISO	Härte	v _c	f _z (mm/z)/Ø								v _c	f _z (mm/z)/Ø							
			1	3	6	8	10	12	16	20		1	3	6	8	10	12	16	20
P	< 500 N/mm ² 500-900 N/mm ²	180	a _p = 1,0xD				a _e = 0,4xD				210	a _p = 2,0xD				a _e max = 0,1xD			
			0,010	0,016	0,030	0,042	0,06	0,072	0,1	0,12		0,011	0,018	0,036	0,048	0,069	0,08	0,11	0,14
M	< 500 N/mm ² 500-900 N/mm ²	120	a _p = 1,0xD				a _e = 0,4xD				140	a _p = 2,0xD				a _e max = 0,1xD			
			0,008	0,014	0,027	0,036	0,05	0,06	0,08	0,1		0,009	0,016	0,031	0,041	0,058	0,07	0,09	0,12
S	< 900 N/mm ²	80	a _p = 1,0xD				a _e = 0,4xD				100	a _p = 2,0xD				a _e max = 0,1xD			
			0,006	0,012	0,025	0,032	0,045	0,055	0,075	0,085		0,007	0,016	0,031	0,041	0,058	0,07	0,09	0,12
N	> 250 N/mm ²	45	a _p = 1,0xD				a _e = 0,4xD				60	a _p = 2,0xD				a _e max = 0,1xD			
			0,005	0,010	0,021	0,028	0,04	0,048	0,06	0,07		0,006	0,013	0,025	0,034	0,048	0,06	0,08	0,1
N	> 250 N/mm ²	350	a _p = 1,0xD				a _e = 0,4xD				600	a _p = 2,0xD				a _e max = 0,1xD			
			0,004	0,008	0,016	0,022	0,032	0,04	0,05	0,065		0,005	0,010	0,020	0,027	0,038	0,05	0,06	0,085
N	> 250 N/mm ²	350	a _p = 1,0xD				a _e = 0,4xD				600	a _p = 2,0xD				a _e max = 0,1xD			
			0,012	0,020	0,038	0,05	0,08	0,095	0,13	0,16		0,013	0,022	0,045	0,06	0,09	0,012	0,15	0,18

SuperF-UT-Fräser

SuperF-UT-Fräser UL



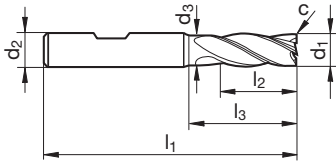
Katalog-Nr. 54503



P	M	K	N	S	H
•	•		•	•	

Arbeitsrichtwerte
Seite 280-293

- speziell für weich-zähe und hochlegierte Werkstoffe
- mittellange Ausführung
- Halsfreischliff
- Zentrumschnitt



Fräswerkzeuge

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
4,000	6,000	3,800	65,000	14,000	27,000	0,080	4	4,000
5,000	6,000	4,800	65,000	15,000	28,000	0,100	4	5,000
6,000	6,000	5,700	75,000	19,000	38,000	0,120	4	6,000
8,000	8,000	7,700	80,000	21,000	43,000	0,160	4	8,000
10,000	10,000	9,500	93,000	26,000	52,000	0,200	4	10,000
12,000	12,000	11,500	100,000	28,000	54,000	0,240	4	12,000
14,000	14,000	13,500	100,000	28,000	54,000	0,280	4	14,000
16,000	16,000	15,500	123,000	38,000	74,000	0,320	4	16,000
20,000	20,000	19,500	126,000	41,000	75,000	0,400	4	20,000

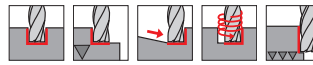
ISO	Härte	v _c	f _z (mm/z)/Ø								v _c	f _z (mm/z)/Ø							
			1	3	6	8	10	12	16	20		1	3	6	8	10	12	16	20
P	< 500 N/mm ²	180	0,010	0,016	0,030	0,042	0,06	0,072	0,1	0,12	210	0,011	0,018	0,036	0,048	0,069	0,08	0,11	0,14
	500-900 N/mm ²	140	0,008	0,014	0,027	0,036	0,05	0,06	0,08	0,1	160	0,009	0,016	0,031	0,041	0,058	0,07	0,09	0,12
M	< 500 N/mm ²	120	0,006	0,012	0,025	0,032	0,045	0,055	0,075	0,085	140	0,007	0,016	0,031	0,041	0,058	0,07	0,09	0,12
	500-900 N/mm ²	80	0,005	0,010	0,021	0,028	0,04	0,048	0,06	0,07	100	0,006	0,013	0,025	0,034	0,048	0,06	0,08	0,1
S	< 900 N/mm ²	45	0,004	0,008	0,016	0,022	0,032	0,04	0,05	0,065	60	0,005	0,010	0,020	0,027	0,038	0,05	0,06	0,085
N	> 250 N/mm ²	350	0,012	0,020	0,038	0,05	0,08	0,095	0,13	0,16	600	0,013	0,022	0,045	0,06	0,09	0,012	0,15	0,18

SuperF-UT-Fräser

SuperF-UT-Fräser VA-X²



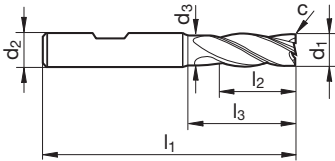
Katalog-Nr. 64553



P	M	K	N	S	H
○	●	○	○	●	○

Arbeitsrichtwerte
Seite 280-293

- extrem hohe Standzeiten durch hochharte TiAlZrN-Beschichtung
- zur Bearbeitung von rost- und säurebeständigen Stählen sowie Nickelbasislegierungen
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,800	57,000	8,000	15,000	0,100	4	3,000
3,500	6,000	3,300	57,000	10,000	15,000	0,100	4	3,500
4,000	6,000	3,800	57,000	11,000	18,000	0,150	4	4,000
4,500	6,000	4,300	57,000	11,000	18,000	0,150	4	4,500
5,000	6,000	4,800	57,000	13,000	18,000	0,150	4	5,000
5,500	6,000	5,300	57,000	13,000	19,400	0,200	4	5,500
6,000	6,000	5,700	57,000	13,000	20,000	0,200	4	6,000
6,500	8,000	6,200	63,000	16,000	24,400	0,250	4	6,500
7,000	8,000	6,700	63,000	16,000	24,900	0,250	4	7,000
7,500	8,000	7,200	63,000	19,000	25,300	0,250	4	7,500
8,000	8,000	7,700	63,000	19,000	26,000	0,250	4	8,000
8,500	10,000	8,200	72,000	19,000	29,400	0,300	4	8,500
9,000	10,000	8,700	72,000	19,000	29,900	0,300	4	9,000
9,500	10,000	9,200	72,000	22,000	30,300	0,300	4	9,500
10,000	10,000	9,500	72,000	22,000	30,000	0,300	4	10,000
11,000	12,000	10,500	83,000	26,000	34,700	0,350	4	11,000
12,000	12,000	11,500	83,000	26,000	36,000	0,350	4	12,000
14,000	14,000	13,500	83,000	26,000	36,000	0,400	4	14,000
16,000	16,000	15,500	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	17,500	92,000	32,000	42,000	0,600	4	18,000
20,000	20,000	19,500	104,000	38,000	52,000	0,600	4	20,000
25,000	25,000	24,000	121,000	45,000	63,000	0,750	4	25,000

Fräswerkzeuge

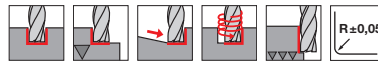
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø								
			3	6	8	10	12	16	20		3	6	8	10	12	16	20		
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28		a _e max = 0,10xD	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23			270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23		a _e max = 0,02xD	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18			120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15		a _e max = 0,02xD	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21			120	0,013	0,026	0,035	0,050	0,06	0,08	0,10
N	≤ 7 % Si	900	0,045	0,090	0,120	0,184	0,22	0,29	0,37		a _e max = 0,02xD	1000	0,021	0,043	0,057	0,088	0,11	0,14	0,18
	≥ 7 % Si	430	0,038	0,076	0,101	0,138	0,17	0,22	0,28			460	0,018	0,036	0,048	0,066	0,08	0,11	0,13

SuperF-UT-Fräser

SuperF-UT-Fräser VA-r



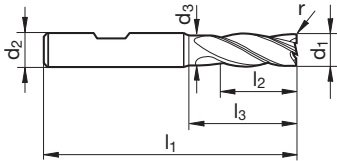
Katalog-Nr. 54542



P	M	K	N	S	H
○	●		○	●	

Arbeitsrichtwerte
Seite 280-293

- rost-/säurebeständige Stähle
- optimiert für Fräsoperationen im HPC und HSC Bereich
- mit definierten Eckradien
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung



Fräswerkzeuge

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	15,000	0,200	4	3,002
3,000	6,000	2,800	57,000	8,000	15,000	0,500	4	3,005
4,000	6,000	3,800	57,000	11,000	18,000	0,200	4	4,002
4,000	6,000	3,800	57,000	11,000	18,000	0,500	4	4,005
4,000	6,000	3,800	57,000	11,000	18,000	1,000	4	4,010
5,000	6,000	4,800	57,000	13,000	18,000	0,200	4	5,002
5,000	6,000	4,800	57,000	13,000	18,000	0,500	4	5,005
5,000	6,000	4,800	57,000	13,000	18,000	1,000	4	5,010
6,000	6,000	5,700	57,000	13,000	20,000	0,200	4	6,002
6,000	6,000	5,700	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,700	57,000	13,000	20,000	1,500	4	6,015
8,000	8,000	7,700	63,000	19,000	26,000	0,300	4	8,003
8,000	8,000	7,700	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,700	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,700	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,500	72,000	22,000	30,000	0,300	4	10,003
10,000	10,000	9,500	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,500	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,500	72,000	22,000	30,000	2,000	4	10,020
10,000	10,000	9,500	72,000	22,000	30,000	2,500	4	10,025
12,000	12,000	11,500	83,000	26,000	36,000	0,300	4	12,003
12,000	12,000	11,500	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,500	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	4	12,030
16,000	16,000	15,500	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,500	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,500	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,500	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,500	104,000	38,000	52,000	0,500	4	20,005
20,000	20,000	19,500	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,500	104,000	38,000	52,000	1,500	4	20,015
20,000	20,000	19,500	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,500	104,000	38,000	52,000	2,500	4	20,025
20,000	20,000	19,500	104,000	38,000	52,000	3,000	4	20,030
20,000	20,000	19,500	104,000	38,000	52,000	4,000	4	20,040

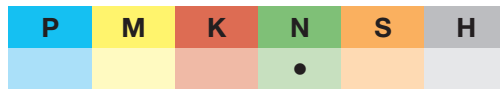
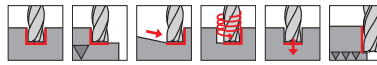
ISO	Härte	v_c	f_z (mm/z)/ \emptyset							v_c	f_z (mm/z)/ \emptyset						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
			$a_p = 1,0xD$								$a_p = 1,0xD$			$a_e \text{ max} = 0,75xD$			
P	$\leq 850 \text{ N/mm}^2$	180	0,016	0,031	0,042	0,060	0,07	0,10	0,12	210	0,018	0,036	0,048	0,069	0,08	0,11	0,14
	$\geq 850 \text{ N/mm}^2$	135	0,014	0,027	0,036	0,050	0,06	0,08	0,10	160	0,016	0,031	0,041	0,058	0,07	0,09	0,12
M	$\leq 750 \text{ N/mm}^2$	120	0,014	0,027	0,036	0,050	0,06	0,08	0,10	140	0,016	0,031	0,041	0,058	0,07	0,09	0,12
	$\geq 750 \text{ N/mm}^2$	60	0,011	0,021	0,028	0,040	0,05	0,06	0,08	80	0,013	0,025	0,034	0,048	0,06	0,08	0,10
S	Ni-Basis	30	0,008	0,017	0,022	0,032	0,04	0,05	0,06	40	0,010	0,020	0,027	0,038	0,05	0,06	0,08
	Ti-Basis	60	0,012	0,024	0,032	0,045	0,05	0,07	0,09	80	0,014	0,029	0,038	0,054	0,06	0,09	0,11
N	$\leq 5\% \text{ Si}$	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	600	0,022	0,045	0,060	0,092	0,11	0,15	0,18
	$\geq 5\% \text{ Si}$	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12	300	0,019	0,038	0,051	0,069	0,08	0,11	0,14

SuperF-UT-Fräser

SuperF-UT-Fräser Al

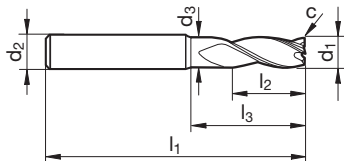


Katalog-Nr. 74557



Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- besonders stabil durch Kernsprung
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- Schneidlänge 3xD
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
5,000	6,000	4,800	57,000	15,000	19,400	0,050	3	5,000
6,000	6,000	5,700	65,000	18,000	28,000	0,060	3	6,000
8,000	8,000	7,700	75,000	24,000	38,000	0,080	3	8,000
10,000	10,000	9,500	80,000	30,000	38,000	0,100	3	10,000
12,000	12,000	11,500	93,000	36,000	46,000	0,120	3	12,000
16,000	16,000	15,500	108,000	48,000	58,000	0,160	3	16,000
20,000	20,000	19,500	126,000	60,000	74,000	0,200	3	20,000

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	900	0,045	0,090	0,120	0,184	0,221	0,294	0,368	1000	0,021	0,043	0,057	0,088	0,106	0,141	0,176
	≥ 5 % Si	400	0,038	0,076	0,101	0,138	0,166	0,221	0,276		460	0,018	0,036	0,048	0,066	0,079	0,106
NE	≤ 850 N/mm ²	470	0,038	0,076	0,101	0,138	0,166	0,221	0,276	500	0,018	0,030	0,036	0,048	0,066	0,079	0,106

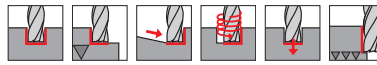
Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser Al-L

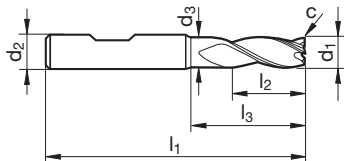


Katalog-Nr. 74556



Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- besonders stabil durch Kernsprung
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- Schneidlänge 3xD
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
5,000	6,000	4,800	57,000	15,000	19,400	0,050	3	5,000
6,000	6,000	5,700	65,000	18,000	28,000	0,060	3	6,000
8,000	8,000	7,700	75,000	24,000	38,000	0,080	3	8,000
10,000	10,000	9,500	80,000	30,000	38,000	0,100	3	10,000
12,000	12,000	11,500	93,000	36,000	46,000	0,120	3	12,000
16,000	16,000	15,500	108,000	48,000	58,000	0,160	3	16,000
20,000	20,000	19,500	126,000	60,000	74,000	0,200	3	20,000

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	900	0,045	0,090	0,120	0,184	0,221	0,294	0,368	1000	0,021	0,043	0,057	0,088	0,106	0,141	0,176
	≥ 5 % Si	400	0,038	0,076	0,101	0,138	0,166	0,221	0,276		460	0,018	0,036	0,048	0,066	0,079	0,106
NE	≤ 850 N/mm ²	470	0,038	0,076	0,101	0,138	0,166	0,221	0,276	500	0,018	0,030	0,036	0,048	0,066	0,079	0,106

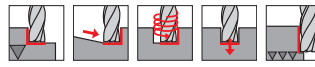
Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser Al

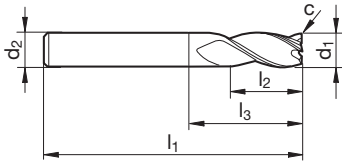


Katalog-Nr. 74559



Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- besonders stabil durch Kernsprung
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- Schneidlänge 5xD
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie
- ohne Halsfreischliff



d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
6,000	6,000	75,000	30,000	38,000	0,060	3	6,000
8,000	8,000	86,000	40,000	49,000	0,080	3	8,000
10,000	10,000	100,000	50,000	58,000	0,100	3	10,000
12,000	12,000	120,000	60,000	73,000	0,120	3	12,000
16,000	16,000	150,000	80,000	100,000	0,160	3	16,000
20,000	20,000	175,000	100,000	123,000	0,200	3	20,000

ISO	Härte	v _c	f _z (mm/z) / Ø							v _c	f _z (mm/z) / Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	400	0,016	0,031	0,042	0,064	0,08	0,10	0,13	450	0,010	0,020	0,026	0,040	0,048	0,064	0,080
	≥ 5 % Si	200	0,013	0,027	0,035	0,048	0,06	0,08	0,10	210	0,008	0,017	0,022	0,030	0,036	0,048	0,060
NE	≤ 850 N/mm ²	190	0,013	0,027	0,035	0,048	0,06	0,08	0,10	220	0,008	0,017	0,022	0,030	0,036	0,048	0,060

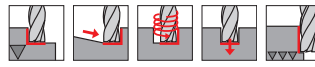
Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser Al-XL



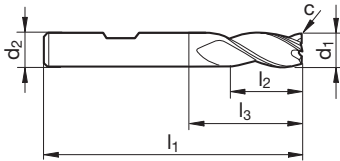
Katalog-Nr. 74558



P	M	K	N	S	H
			•		

Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- besonders stabil durch Kernsprung
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- Schneidlänge 5xD
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie
- ohne Halsfreischliff



d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
6,000	6,000	75,000	30,000	39,000	0,060	3	6,000
8,000	8,000	86,000	40,000	50,000	0,080	3	8,000
10,000	10,000	100,000	50,000	60,000	0,100	3	10,000
12,000	12,000	120,000	60,000	75,000	0,120	3	12,000
16,000	16,000	150,000	80,000	102,000	0,160	3	16,000
20,000	20,000	175,000	100,000	125,000	0,200	3	20,000

ISO	Härte	v _c	f _z (mm/z) / Ø							v _c	f _z (mm/z) / Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	400	0,016	0,031	0,042	0,064	0,08	0,10	0,13	450	0,010	0,020	0,026	0,040	0,048	0,064	0,080
	≥ 5 % Si	200	0,013	0,027	0,035	0,048	0,06	0,08	0,10	210	0,008	0,017	0,022	0,030	0,036	0,048	0,060
NE	≤ 850 N/mm ²	190	0,013	0,027	0,035	0,048	0,06	0,08	0,10	220	0,008	0,017	0,022	0,030	0,036	0,048	0,060

Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser N

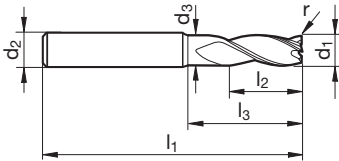


Katalog-Nr. 74563

P	M	K	N	S	H
			•		

Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- mit definierten Eckradien
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie



Fräswerkzeuge

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
6,000	6,000	5,700	57,000	13,000	20,000	0,500	3	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	3	6,010
8,000	8,000	7,700	63,000	19,000	26,000	0,500	3	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	3	8,010
10,000	10,000	9,500	72,000	22,000	30,000	0,500	3	10,005
10,000	10,000	9,500	72,000	22,000	30,000	1,000	3	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	3	10,015
12,000	12,000	11,500	83,000	26,000	36,000	0,500	3	12,005
12,000	12,000	11,500	83,000	26,000	36,000	1,000	3	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	3	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	3	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	3	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	3	12,030
12,000	12,000	11,500	83,000	26,000	36,000	4,000	3	12,040
16,000	16,000	15,500	92,000	32,000	42,000	1,000	3	16,010
16,000	16,000	15,500	92,000	32,000	42,000	2,000	3	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	3	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	3	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	3	16,040
20,000	20,000	19,500	104,000	38,000	52,000	1,000	3	20,010
20,000	20,000	19,500	104,000	38,000	52,000	2,000	3	20,020
20,000	20,000	19,500	104,000	38,000	52,000	2,500	3	20,025
20,000	20,000	19,500	104,000	38,000	52,000	3,000	3	20,030
20,000	20,000	19,500	104,000	38,000	52,000	4,000	3	20,040
25,000	25,000	24,000	121,000	45,000	63,000	2,000	3	25,020
25,000	25,000	24,000	121,000	45,000	63,000	3,000	3	25,030
25,000	25,000	24,000	121,000	45,000	63,000	4,000	3	25,040

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	750	0,025	0,051	0,068	0,104	0,12	0,17	0,21
	≥ 5 % Si	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12		345	0,021	0,043	0,057	0,078	0,09	0,12
NE	≤ 850 N/mm ²	250	0,017	0,033	0,044	0,060	0,07	0,10	0,12	375	0,021	0,043	0,057	0,078	0,09	0,12	0,16

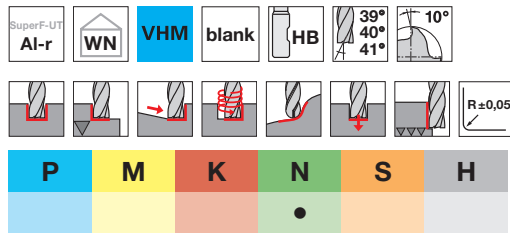
Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser Al-r

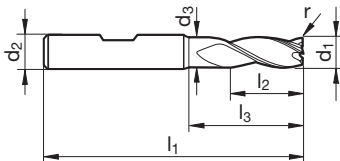


Katalog-Nr. 74562



Arbeitsrichtwerte
Seite 280-293

- nanopolierte Schneidkanten
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- mit definierten Eckradien
- Spiegelschliff für optimale Spanabfuhr
- optimierte Mikrogeometrie



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
6,000	6,000	5,700	57,000	13,000	20,000	0,500	3	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	3	6,010
8,000	8,000	7,700	63,000	19,000	26,000	0,500	3	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	3	8,010
10,000	10,000	9,500	72,000	22,000	30,000	0,500	3	10,005
10,000	10,000	9,500	72,000	22,000	30,000	1,000	3	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	3	10,015
12,000	12,000	11,500	83,000	26,000	36,000	0,500	3	12,005
12,000	12,000	11,500	83,000	26,000	36,000	1,000	3	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	3	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	3	12,020
12,000	12,000	11,500	83,000	26,000	36,000	2,500	3	12,025
12,000	12,000	11,500	83,000	26,000	36,000	3,000	3	12,030
12,000	12,000	11,500	83,000	26,000	36,000	4,000	3	12,040
16,000	16,000	15,500	92,000	32,000	42,000	1,000	3	16,010
16,000	16,000	15,500	92,000	32,000	42,000	2,000	3	16,020
16,000	16,000	15,500	92,000	32,000	42,000	2,500	3	16,025
16,000	16,000	15,500	92,000	32,000	42,000	3,000	3	16,030
16,000	16,000	15,500	92,000	32,000	42,000	4,000	3	16,040
20,000	20,000	19,500	104,000	38,000	52,000	1,000	3	20,010
20,000	20,000	19,500	104,000	38,000	52,000	2,000	3	20,020
20,000	20,000	19,500	104,000	38,000	52,000	2,500	3	20,025
20,000	20,000	19,500	104,000	38,000	52,000	3,000	3	20,030
20,000	20,000	19,500	104,000	38,000	52,000	4,000	3	20,040
25,000	25,000	24,000	121,000	45,000	63,000	2,000	3	25,020
25,000	25,000	24,000	121,000	45,000	63,000	3,000	3	25,030
25,000	25,000	24,000	121,000	45,000	63,000	4,000	3	25,040

Fräswerkzeuge

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	750	0,025	0,051	0,068	0,104	0,12	0,17	0,21
	≥ 5 % Si	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12		345	0,021	0,043	0,057	0,078	0,09	0,12
NE	≤ 850 N/mm ²	250	0,017	0,033	0,044	0,060	0,07	0,10	0,12	375	0,021	0,043	0,057	0,078	0,09	0,12	0,16

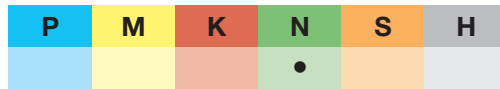
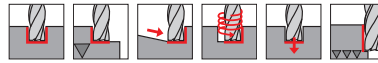
Optional bieten wir unsere Carbo-Beschichtung zur Verbesserung von Spanfluss und Standzeit an.

SuperF-UT-Fräser

SuperF-UT-Fräser N

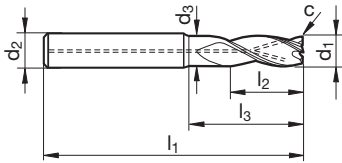


Katalog-Nr. 54593



Arbeitsrichtwerte
Seite 280-293

- mit Innenkühlung: radiale und axiale Austritte
- nanopolierte Schneidkanten
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- extrem hohe Standzeiten durch hochharte DLC-Beschichtung



d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
5,000	6,000	4,800	57,000	13,000	18,000	0,050	3	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,060	3	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,080	3	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	3	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,120	3	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,160	3	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,200	3	20,000

Fräswerkzeuge

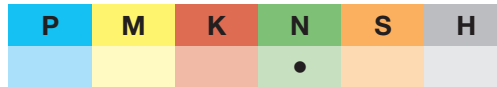
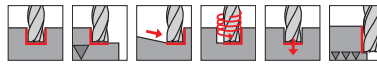
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	750	0,025	0,051	0,068	0,104	0,12	0,17	0,21
	≥ 5 % Si	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12		345	0,021	0,043	0,057	0,078	0,09	0,12
NE	≤ 850 N/mm ²	250	0,017	0,033	0,044	0,060	0,07	0,10	0,12	375	0,021	0,043	0,057	0,078	0,09	0,12	0,16

SuperF-UT-Fräser

SuperF-UT-Fräser Al-X

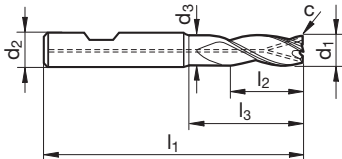


Katalog-Nr. 54592



Arbeitsrichtwerte
Seite 280-293

- mit Innenkühlung: radiale und axiale Austritte
- nanopolierte Schneidkanten
- Halsfreischliff
- Zentrumschnitt
- 3-Schneider mit vergrößerten Spanräumen
- Al und Al-Legierungen sowie weitere langspanende NE-Metalle
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- extrem hohe Standzeiten durch hochharte DLC-Beschichtung



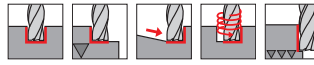
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
5,000	6,000	4,800	57,000	13,000	18,000	0,050	3	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,060	3	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,080	3	8,000
10,000	10,000	9,500	72,000	22,000	30,000	0,100	3	10,000
12,000	12,000	11,500	83,000	26,000	36,000	0,120	3	12,000
16,000	16,000	15,500	92,000	32,000	42,000	0,160	3	16,000
20,000	20,000	19,500	104,000	38,000	52,000	0,200	3	20,000

Fräswerkzeuge

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
N	≤ 5 % Si	500	0,020	0,039	0,052	0,080	0,10	0,13	0,16	750	0,025	0,051	0,068	0,104	0,12	0,17	0,21
	≥ 5 % Si	230	0,017	0,033	0,044	0,060	0,07	0,10	0,12		345	0,021	0,043	0,057	0,078	0,09	0,12
NE	≤ 850 N/mm ²	250	0,017	0,033	0,044	0,060	0,07	0,10	0,12	375	0,021	0,043	0,057	0,078	0,09	0,12	0,16

SuperF-UT-Fräser

SuperF-UT-Fräser Z, Sätze



P	M	K	N	S	H
•	•			•	

Arbeitsrichtwerte
Seite 280-293

Katalog-Nr. 78882

- besonders stabil durch Kernsprung
- universell einsetzbar
- Werkstoffe bis 1400 N/mm²
- Mikroeckenschutz
- Zentrumschnitt
- ungleiche Teilung
- HPC-Bearbeitung in zähen, niedrig- und hochlegierten Stählen und in schwer bearbeitbaren Sonderwerkstoffen
- bestehend aus Katalog-Nr. 54577

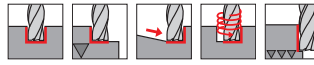
Code-Nr.	d1 mm	Stück/Satz
1,000	6,0-16,0	5
2,000	6,0-12,0	4

Fräszeuge

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			a _p =l2		HPC	HSC		a _e max = 0,10xD	a _p =l2			a _e max = 0,02xD					
P	≤ 850 N/mm ²	340	0,036	0,072	0,096	0,138	0,17	0,22	0,28	360	0,017	0,034	0,046	0,066	0,08	0,11	0,13
	≥ 850 N/mm ²	250	0,031	0,062	0,083	0,115	0,14	0,18	0,23	270	0,015	0,030	0,040	0,055	0,07	0,09	0,11
M	≤ 750 N/mm ²	220	0,031	0,062	0,083	0,115	0,14	0,18	0,23	240	0,015	0,030	0,040	0,055	0,07	0,09	0,11
	≥ 750 N/mm ²	110	0,024	0,048	0,064	0,092	0,11	0,15	0,18	120	0,011	0,021	0,028	0,040	0,05	0,06	0,08
S	Ni-Basis	60	0,019	0,039	0,052	0,074	0,09	0,12	0,15	60	0,008	0,017	0,022	0,032	0,04	0,05	0,06
	Ti-Basis	110	0,028	0,055	0,074	0,104	0,12	0,17	0,21	120	0,013	0,026	0,035	0,050	0,06	0,08	0,10

SuperF-UT-Fräser

SuperF-UT-Fräser N², Sätze



P	M	K	N	S	H
●	○	●	●	○	○

Arbeitsrichtwerte
Seite 280-293

Katalog-Nr. 78883

- sehr großes Materialspektrum = universeller Einsatzbereich
- extrem hohe Standzeiten durch hochharte TiAlZrN-Beschichtung
- bis 1600 N/mm²
- Mikroeckenschutz
- Halsfreischliff
- Zentrumschnitt
- ruhiger, vibrationsfreier Lauf durch ungleiche Drallsteigung
- bestehend aus Katalog-Nr. 64552

Code-Nr.	d1 mm	Stück/Satz
1,000	6,0-16,0	5

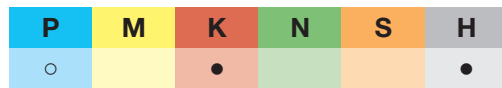
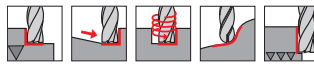
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	180	0,016	0,031	0,042	0,060	0,07	0,10	0,12	305	0,025	0,050	0,067	0,096	0,12	0,15	0,19
	≥ 850 N/mm ²	135	0,014	0,027	0,036	0,050	0,06	0,08	0,10		230	0,022	0,043	0,058	0,080	0,10	0,13
K	≤ 240 HB	160	0,017	0,033	0,044	0,065	0,08	0,10	0,13	270	0,026	0,053	0,070	0,104	0,12	0,17	0,21
	≥ 240 HB	140	0,015	0,030	0,040	0,055	0,07	0,09	0,11		240	0,024	0,048	0,064	0,088	0,11	0,14

VHM Fräser

Kopierfräser mit Vollradius H B2

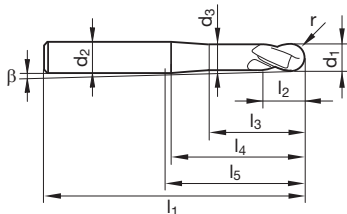


Katalog-Nr. 54325



Arbeitsrichtwerte
Seite 280-293

- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- lange Ausführung



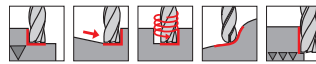
d1 ^{-0,01} / _{-0,03} mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	45,000	0,500	2,500	9,100	17,000	0,250	11,100	2	0,500
0,800	4,000	0,750	45,000	0,800	3,200	9,300	17,000	0,400	10,200	2	0,800
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,500	9,200	2	1,000
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,750	7,000	2	1,500
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	1,000	8,900	2	2,000
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	1,500	5,700	2	3,000
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	2,000	3,800	2	4,000
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	2,500	1,700	2	5,000
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	3,000		2	6,000
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	4,000		2	8,000
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	5,000		2	10,000
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	6,000		2	12,000

VHM Fräser

Kopierfräser mit Vollradius H B2



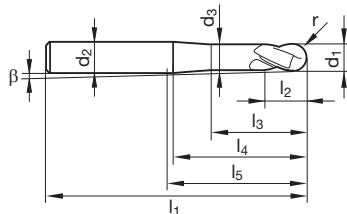
Katalog-Nr. 54326



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung



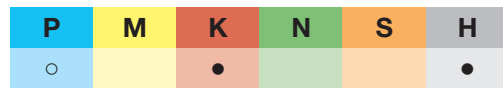
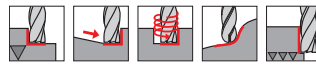
d1 $^{+0,01}$ $_{-0,03}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	50,000	0,500	3,600	10,200	22,000	0,250	9,900	2	0,500
0,800	4,000	0,750	50,000	0,800	5,000	11,100	22,000	0,400	8,500	2	0,800
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,500	7,300	2	1,000
1,500	4,000	1,400	50,000	1,500	10,000	14,900	22,000	0,750	5,000	2	1,500
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	1,000	6,400	2	2,000
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	1,500	3,700	2	3,000
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	2,000	2,200	2	4,000
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	2,500	0,900	2	5,000
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	3,000		2	6,000
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	4,000		2	8,000
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	5,000		2	10,000
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	6,000		2	12,000

VHM Fräser

Kopierfräser mit Vollradius H B4

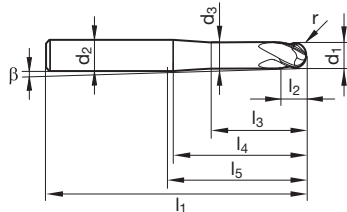


Katalog-Nr. 54345



Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- $R \pm 0,02$
- ab $\varnothing 4,0$ mm mit TiAlSiN-Beschichtung
- lange Ausführung



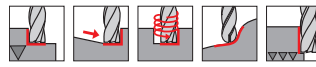
d1 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,500	9,200	4	1,000
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,750	7,000	4	1,500
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	1,000	8,900	4	2,000
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	1,500	5,700	4	3,000
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	2,000	3,800	4	4,000
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	2,500	1,700	4	5,000
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	3,000		4	6,000
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	4,000		4	8,000
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	5,000		4	10,000
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	6,000		4	12,000

VHM Fräser

Kopierfräser mit Vollradius H B4



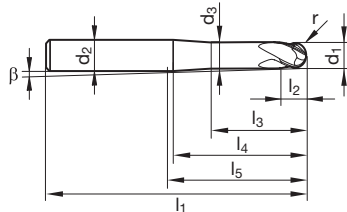
Katalog-Nr. 54346



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,02
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung



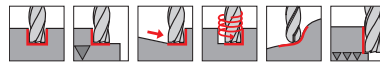
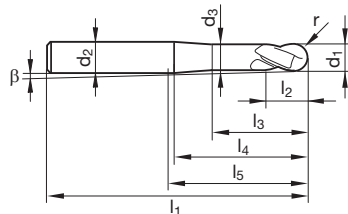
d1 ^{-0,01} / _{-0,03} mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	50,000	1,000	6,500	12,200	25,025	0,500	7,300	4	1,000
1,500	4,000	1,400	50,000	1,500	10,000	14,900	25,538	0,750	5,000	4	1,500
2,000	6,000	1,850	57,000	2,000	13,000	18,700	29,550	1,000	6,400	4	2,000
3,000	6,000	2,850	65,000	3,000	20,000	24,300	34,575	1,500	3,700	4	3,000
4,000	6,000	3,800	75,000	4,000	25,000	28,000	40,600	2,000	2,200	4	4,000
5,000	6,000	4,800	75,000	5,000	31,000	32,600	41,625	2,500	0,900	4	5,000
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	3,000		4	6,000
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	4,000		4	8,000
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	5,000		4	10,000
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	6,000		4	12,000

VHM Fräser

Kopierfräser mit Vollradius S B2



Katalog-Nr. 54425



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- lange Ausführung

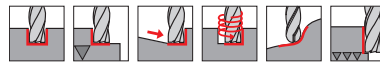
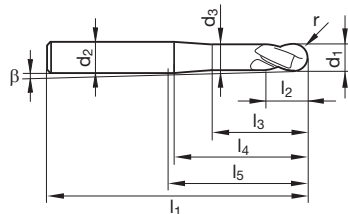
d1 $\begin{smallmatrix} -0,01 \\ -0,03 \end{smallmatrix}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	45,000	0,500	2,500	9,100	17,000	0,250	11,100	2	0,500
0,800	4,000	0,750	45,000	0,800	3,200	9,300	17,000	0,400	10,200	2	0,800
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,500	9,200	2	1,000
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,750	7,000	2	1,500
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	1,000	8,900	2	2,000
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	1,500	5,700	2	3,000
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	2,000	3,800	2	4,000
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	2,500	1,700	2	5,000
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	3,000		2	6,000
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	4,000		2	8,000
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	5,000		2	10,000
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	6,000		2	12,000

VHM Fräser

Kopierfräser mit Vollradius S B2



Katalog-Nr. 54426



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung

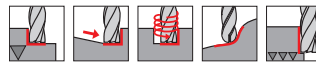
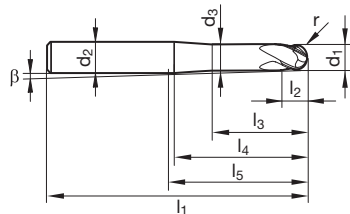
d1 ^{-0,01} / _{-0,03} mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	50,000	0,500	3,600	10,200	22,000	0,250	9,900	2	0,500
0,800	4,000	0,750	50,000	0,800	5,000	11,100	22,000	0,400	8,500	2	0,800
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,500	7,300	2	1,000
1,500	4,000	1,400	50,000	1,500	10,000	14,900	22,000	0,750	5,000	2	1,500
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	1,000	6,400	2	2,000
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	1,500	3,700	2	3,000
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	2,000	2,200	2	4,000
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	2,500	0,900	2	5,000
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	3,000		2	6,000
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	4,000		2	8,000
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	5,000		2	10,000
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	6,000		2	12,000

VHM Fräser

Kopierfräser mit Vollradius S B4



Katalog-Nr. 54445



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,02
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- lange Ausführung

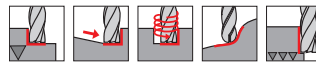
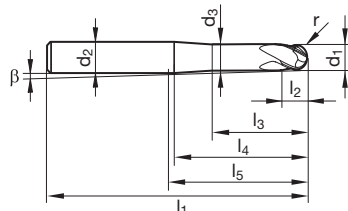
d1 ^{-0,01} / _{-0,03} mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,500	9,200	4	1,000
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,750	7,000	4	1,500
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	1,000	8,900	4	2,000
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	1,500	5,700	4	3,000
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	2,000	3,800	4	4,000
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	2,500	1,700	4	5,000
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	3,000		4	6,000
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	4,000		4	8,000
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	5,000		4	10,000
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	6,000		4	12,000

VHM Fräser

Kopierfräser mit Vollradius S B4



Katalog-Nr. 54446



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,02
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung

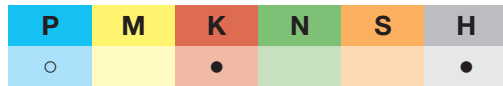
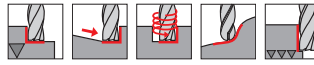
d1 ^{-0,01} / _{-0,03} mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	50,000	1,000	6,500	12,200	25,000	0,500	7,300	4	1,000
1,500	4,000	1,400	50,000	1,500	10,000	14,900	25,500	0,750	5,000	4	1,500
2,000	6,000	1,850	57,000	2,000	13,000	18,700	29,500	1,000	6,400	4	2,000
3,000	6,000	2,850	65,000	3,000	20,000	24,300	34,500	1,500	3,700	4	3,000
4,000	6,000	3,800	75,000	4,000	25,000	28,000	40,500	2,000	2,200	4	4,000
5,000	6,000	4,800	75,000	5,000	31,000	32,600	41,500	2,500	0,900	4	5,000
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	3,000		4	6,000
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	4,000		4	8,000
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	5,000		4	10,000
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	6,000		4	12,000

VHM Fräser

Kopierfräser mit Torusanschliff H T4

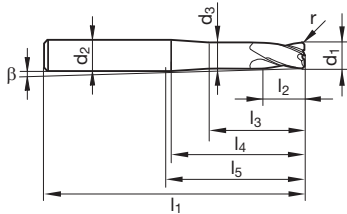


Katalog-Nr. 54347



Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- lange Ausführung



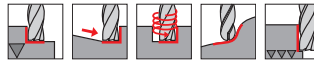
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,100	8,800	4	1,001
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,200	8,900	4	1,002
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,200	6,600	4	1,502
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,100	8,300	4	2,001
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,200	8,400	4	2,002
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,500	8,600	4	2,005
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,100	5,300	4	3,001
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,300	5,300	4	3,003
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,500	5,400	4	3,005
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,200	3,400	4	4,002
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,300	3,400	4	4,003
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,500	3,400	4	4,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,200	1,500	4	5,002
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,500	1,500	4	5,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	1,000	1,600	4	5,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,200		4	6,002
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,300		4	6,003
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,500		4	6,005
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,000		4	6,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,500		4	6,015
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	2,000		4	6,020
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,300		4	8,003
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,500		4	8,005
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,000		4	8,010
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,500		4	8,015
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	2,000		4	8,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,300		4	10,003
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,500		4	10,005
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,000		4	10,010
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,500		4	10,015
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	2,000		4	10,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	3,000		4	10,030
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	0,500		4	12,005
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	1,000		4	12,010
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	2,000		4	12,020
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	3,000		4	12,030
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	4,000		4	12,040

VHM Fräser

Kopierfräser mit Torusanschliff H T4

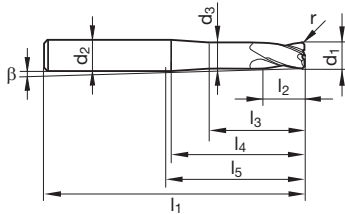


Katalog-Nr. 54348



Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- $R \pm 0,01$
- mittellange Ausführung



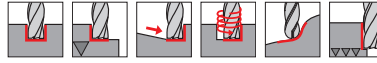
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,100	7,000	4	1,001
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,200	7,100	4	1,002
1,500	4,000	1,400	50,000	1,500	10,000	14,900	22,000	0,200	4,800	4	1,502
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,100	6,100	4	2,001
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,200	6,100	4	2,002
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,500	6,200	4	2,005
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,100	3,500	4	3,001
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,300	3,500	4	3,003
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,500	3,600	4	3,005
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,200	2,000	4	4,002
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,300	2,000	4	4,003
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,500	2,000	4	4,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	0,200	0,800	4	5,002
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	0,500	0,900	4	5,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	1,000	0,900	4	5,010
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,200		4	6,002
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,300		4	6,003
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,500		4	6,005
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	1,000		4	6,010
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	1,500		4	6,015
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	2,000		4	6,020
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	0,300		4	8,003
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	0,500		4	8,005
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	1,000		4	8,010
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	1,500		4	8,015
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	2,000		4	8,020
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	0,300		4	10,003
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	0,500		4	10,005
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	1,000		4	10,010
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	1,500		4	10,015
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	2,000		4	10,020
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	3,000		4	10,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	0,500		4	12,005
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	1,000		4	12,010
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	2,000		4	12,020
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	3,000		4	12,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	4,000		4	12,040

VHM Fräser

Kopierfräser mit Torusanschleiß S T2



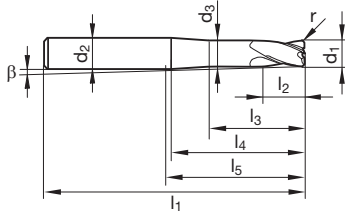
Katalog-Nr. 54427



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- lange Ausführung



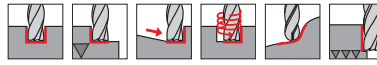
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	45,000	0,500	3,000	9,600	17,000	0,100	10,400	2	0,501
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,100	8,800	2	1,001
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,200	8,900	2	1,002
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,200	6,600	2	1,502
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,100	8,300	2	2,001
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,200	8,400	2	2,002
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,500	8,600	2	2,005
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,100	5,300	2	3,001
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,300	5,300	2	3,003
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,500	5,400	2	3,005
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,200	3,400	2	4,002
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,300	3,400	2	4,003
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,500	3,400	2	4,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,200	1,500	2	5,002
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,500	1,500	2	5,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	1,000	1,600	2	5,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,200		2	6,002
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,300		2	6,003
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,500		2	6,005
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,000		2	6,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,500		2	6,015
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	2,000		2	6,020
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,300		2	8,003
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,500		2	8,005
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,000		2	8,010
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,500		2	8,015
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	2,000		2	8,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,300		2	10,003
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,500		2	10,005
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,000		2	10,010
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,500		2	10,015
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	2,000		2	10,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	3,000		2	10,030
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	0,500		2	12,005
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	1,000		2	12,010
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	2,000		2	12,020
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	3,000		2	12,030

VHM Fräser

Kopierfräser mit Torusanschliff S T2



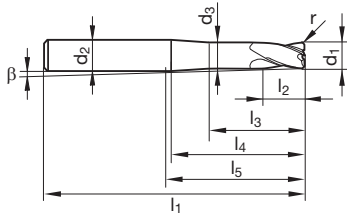
Katalog-Nr. 54428



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung



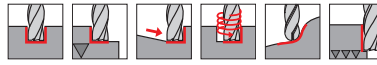
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,450	50,000	0,500	3,600	10,200	22,000	0,100	9,800	2	0,501
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,100	7,000	2	1,001
1,000	4,000	0,920	50,000	1,000	6,500	12,200	22,000	0,200	7,100	2	1,002
1,500	4,000	1,400	50,000	1,500	10,000	14,900	22,000	0,200	4,800	2	1,502
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,100	6,100	2	2,001
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,200	6,100	2	2,002
2,000	6,000	1,850	57,000	2,000	13,000	18,700	21,000	0,500	6,200	2	2,005
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,100	3,500	2	3,001
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,300	3,500	2	3,003
3,000	6,000	2,850	65,000	3,000	20,000	24,300	29,000	0,500	3,600	2	3,005
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,200	2,000	2	4,002
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,300	2,000	2	4,003
4,000	6,000	3,800	75,000	4,000	25,000	28,000	39,000	0,500	2,000	2	4,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	0,200	0,800	2	5,002
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	0,500	0,900	2	5,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	39,000	1,000	0,900	2	5,010
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,200		2	6,002
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,300		2	6,003
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	0,500		2	6,005
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	1,000		2	6,010
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	1,500		2	6,015
6,000	6,000	5,700	75,000	6,000	38,000	38,600	39,000	2,000		2	6,020
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	0,300		2	8,003
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	0,500		2	8,005
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	1,000		2	8,010
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	1,500		2	8,015
8,000	8,000	7,700	90,000	8,000	53,000	53,600	54,000	2,000		2	8,020
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	0,300		2	10,003
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	0,500		2	10,005
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	1,000		2	10,010
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	1,500		2	10,015
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	2,000		2	10,020
10,000	10,000	9,500	100,000	10,000	59,000	59,900	60,000	3,000		2	10,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	0,500		2	12,005
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	1,000		2	12,010
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	2,000		2	12,020
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	3,000		2	12,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	4,000		2	12,040

VHM Fräser

Kopierfräser mit Torusanschliff S T4



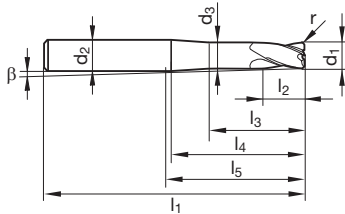
Katalog-Nr. 54447



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- lange Ausführung



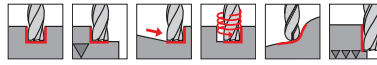
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,100	8,800	4	1,001
1,000	4,000	0,920	45,000	1,000	4,000	9,700	17,000	0,200	8,900	4	1,002
1,500	4,000	1,400	45,000	1,500	6,000	10,900	17,000	0,200	6,600	4	1,502
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,100	8,300	4	2,001
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,200	8,400	4	2,002
2,000	6,000	1,850	54,000	2,000	8,000	13,700	18,000	0,500	8,600	4	2,005
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,100	5,300	4	3,001
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,300	5,300	4	3,003
3,000	6,000	2,850	54,000	3,000	12,000	16,300	18,000	0,500	5,400	4	3,005
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,200	3,400	4	4,002
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,300	3,400	4	4,003
4,000	6,000	3,800	57,000	4,000	14,000	17,000	21,000	0,500	3,400	4	4,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,200	1,500	4	5,002
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	0,500	1,500	4	5,005
5,000	6,000	4,800	57,000	5,000	17,000	18,600	21,000	1,000	1,600	4	5,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,200		4	6,002
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,300		4	6,003
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	0,500		4	6,005
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,000		4	6,010
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	1,500		4	6,015
6,000	6,000	5,700	57,000	6,000	20,000	20,600	21,000	2,000		4	6,020
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,300		4	8,003
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	0,500		4	8,005
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,000		4	8,010
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	1,500		4	8,015
8,000	8,000	7,700	63,000	8,000	26,000	26,600	27,000	2,000		4	8,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,300		4	10,003
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	0,500		4	10,005
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,000		4	10,010
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	1,500		4	10,015
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	2,000		4	10,020
10,000	10,000	9,500	72,000	10,000	31,000	31,900	32,000	3,000		4	10,030
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	0,500		4	12,005
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	1,000		4	12,010
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	2,000		4	12,020
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	3,000		4	12,030
12,000	12,000	11,500	83,000	12,000	37,000	37,900	38,000	4,000		4	12,040

VHM Fräser

Kopierfräser mit Torusanschlift S T4



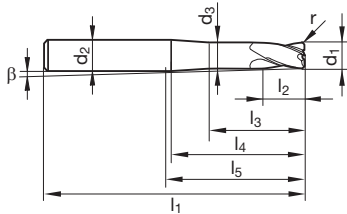
Katalog-Nr. 54448



P	M	K	N	S	H
●	●	●	○	●	●

Arbeitsrichtwerte
Seite 280-293

- Halsfreischliff
- Zentrumschnitt
- R +/- 0,01
- ab Ø 4,0 mm mit TiAlSiN-Beschichtung
- mittellange Ausführung



d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,920	50,000	1,000	6,500	12,200	20,000	0,100	7,000	4	1,001
1,000	4,000	0,920	50,000	1,000	6,500	12,200	20,000	0,200	7,100	4	1,002
1,500	4,000	1,400	50,000	1,500	10,000	14,900	20,000	0,200	4,800	4	1,502
2,000	6,000	1,850	57,000	2,000	13,000	18,700	17,000	0,100	6,100	4	2,001
2,000	6,000	1,850	57,000	2,000	13,000	18,700	17,000	0,200	6,100	4	2,002
2,000	6,000	1,850	57,000	2,000	13,000	18,700	17,000	0,500	6,200	4	2,005
3,000	6,000	2,850	65,000	3,000	20,000	24,300	25,000	0,100	3,500	4	3,001
3,000	6,000	2,850	65,000	3,000	20,000	24,300	25,000	0,300	3,500	4	3,003
3,000	6,000	2,850	65,000	3,000	20,000	24,300	25,000	0,500	3,600	4	3,005
4,000	6,000	3,800	75,000	4,000	25,000	28,000	35,000	0,200	2,000	4	4,002
4,000	6,000	3,800	75,000	4,000	25,000	28,000	35,000	0,300	2,000	4	4,003
4,000	6,000	3,800	75,000	4,000	25,000	28,000	35,000	0,500	2,000	4	4,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	35,000	0,200	0,800	4	5,002
5,000	6,000	4,800	75,000	5,000	31,000	32,600	35,000	0,500	0,900	4	5,005
5,000	6,000	4,800	75,000	5,000	31,000	32,600	35,000	1,000	0,900	4	5,010
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	0,200		4	6,002
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	0,300		4	6,003
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	0,500		4	6,005
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	1,000		4	6,010
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	1,500		4	6,015
6,000	6,000	5,700	75,000	6,000	34,000	34,600	35,000	2,000		4	6,020
8,000	8,000	7,700	90,000	8,000	49,000	49,600	50,000	0,300		4	8,003
8,000	8,000	7,700	90,000	8,000	49,000	49,600	50,000	0,500		4	8,005
8,000	8,000	7,700	90,000	8,000	49,000	49,600	50,000	1,000		4	8,010
8,000	8,000	7,700	90,000	8,000	49,000	49,600	50,000	1,500		4	8,015
8,000	8,000	7,700	90,000	8,000	49,000	49,600	50,000	2,000		4	8,020
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	0,300		4	10,003
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	0,500		4	10,005
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	1,000		4	10,010
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	1,500		4	10,015
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	2,000		4	10,020
10,000	10,000	9,500	100,000	10,000	54,000	54,900	55,000	3,000		4	10,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	0,500		4	12,005
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	1,000		4	12,010
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	2,000		4	12,020
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	3,000		4	12,030
12,000	12,000	11,500	120,000	12,000	74,000	74,900	75,000	4,000		4	12,040

VHM Fräser

Hartfräser, mehrschneidig H FS6



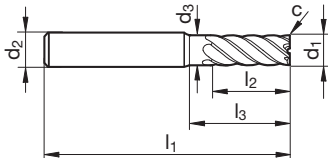
Katalog-Nr. 54360



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- ohne Zentrumschnitt
- Halsfreischliff
- lange Ausführung



d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	12,000	0,030	6	3,000
4,000	6,000	3,800	57,000	11,000	15,000	0,040	6	4,000
5,000	6,000	4,800	57,000	13,000	18,000	0,050	6	5,000
6,000	6,000	5,700	57,000	13,000	20,000	0,060	6	6,000
8,000	8,000	7,700	63,000	19,000	26,000	0,080	6	8,000
10,000	10,000	9,500	72,000	22,000	31,000	0,100	6	10,000
12,000	12,000	11,500	83,000	26,000	37,000	0,120	6	12,000
14,000	14,000	13,500	83,000	26,000	37,000	0,140	6	14,000
16,000	16,000	15,500	92,000	32,000	43,000	0,160	6	16,000
20,000	20,000	19,500	104,000	38,000	53,000	0,200	6	20,000

VHM Fräser

Hartfräser, mehrschneidig H FS6



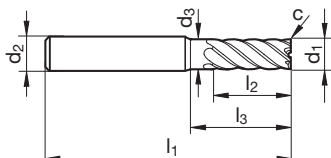
Katalog-Nr. 54361



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- ohne Zentrumschnitt
- Halsfreischliff
- extra lange Ausführung



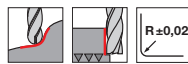
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr.
3,000	6,000	2,850	65,000	11,000	21,000	0,030	6	3,000
4,000	6,000	3,800	65,000	14,000	26,000	0,040	6	4,000
5,000	6,000	4,800	75,000	17,000	32,000	0,050	6	5,000
6,000	6,000	5,700	75,000	20,000	38,000	0,060	6	6,000
8,000	8,000	7,700	90,000	28,000	53,000	0,080	6	8,000
10,000	10,000	9,500	100,000	31,000	59,000	0,100	6	10,000
12,000	12,000	11,500	114,000	36,000	68,000	0,120	6	12,000
14,000	14,000	13,500	100,000	42,000	54,000	0,140	6	14,000
16,000	16,000	15,500	125,000	52,000	76,000	0,160	6	16,000
20,000	20,000	19,500	150,000	62,000	99,000	0,200	6	20,000

VHM Fräser

Hartfräser, mehrschneidig H FS6



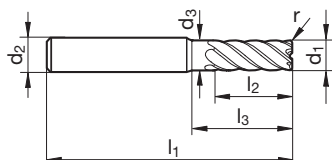
Katalog-Nr. 54362



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- ohne Zentrumschnitt
- Halsfreischliff
- lange Ausführung



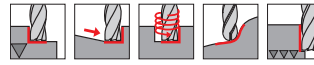
d1 f8 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Code-Nr.
3,000	6,000	2,850	57,000	8,000	12,000	0,100	6	3,001
3,000	6,000	2,850	57,000	8,000	12,000	0,300	6	3,003
3,000	6,000	2,850	57,000	8,000	12,000	0,500	6	3,005
4,000	6,000	3,800	57,000	11,000	15,000	0,200	6	4,002
4,000	6,000	3,800	57,000	11,000	15,000	0,500	6	4,005
5,000	6,000	4,800	57,000	13,000	18,000	0,200	6	5,002
5,000	6,000	4,800	57,000	13,000	18,000	0,500	6	5,005
6,000	6,000	5,700	57,000	13,000	20,000	0,200	6	6,002
6,000	6,000	5,700	57,000	13,000	20,000	0,500	6	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	6	6,010
8,000	8,000	7,700	63,000	19,000	26,000	0,300	6	8,003
8,000	8,000	7,700	63,000	19,000	26,000	0,500	6	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	6	8,010
10,000	10,000	9,500	72,000	22,000	31,000	0,300	6	10,003
10,000	10,000	9,500	72,000	22,000	31,000	0,500	6	10,005
10,000	10,000	9,500	72,000	22,000	31,000	1,000	6	10,010
10,000	10,000	9,500	72,000	22,000	31,000	1,500	6	10,015
12,000	12,000	11,500	83,000	26,000	37,000	0,500	6	12,005
12,000	12,000	11,500	83,000	26,000	37,000	1,500	6	12,015
12,000	12,000	11,500	83,000	26,000	37,000	1,000	6	12,100
16,000	16,000	15,500	92,000	32,000	43,000	0,500	6	16,005
16,000	16,000	15,500	92,000	32,000	43,000	1,000	6	16,010
16,000	16,000	15,500	92,000	32,000	43,000	2,000	6	16,020

VHM Fräser

Kopierfräser mit Torusanschlift



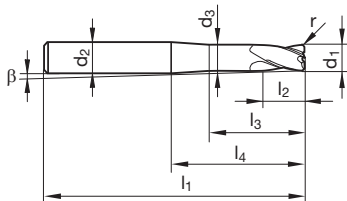
Katalog-Nr. 54304



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- kurz
- Zentrumschnitt
- für den Formenbau
- hohe Standzeiten durch hochharte Beschichtung
- bis 63 HRC



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,950	50,000	2,000	6,000	20,000	0,200	4,000	2	1,002
2,000	6,000	1,900	57,000	3,000	8,000	21,000	0,200	5,500	2	2,002
2,000	6,000	1,900	57,000	3,000	8,000	21,000	0,500	5,600	2	2,005
3,000	6,000	2,800	57,000	3,500	14,000	21,000	0,500	4,200	4	3,000
3,000	6,000	2,800	57,000	3,500	14,000	21,000	0,300	4,200	4	3,003
4,000	6,000	3,800	57,000	4,000	16,000	21,000	0,500	2,800	4	4,000
4,000	6,000	3,800	57,000	4,000	16,000	21,000	0,300	2,800	4	4,003
5,000	6,000	4,800	57,000	5,000	18,000	21,000	0,500	1,400	4	5,000
5,000	6,000	4,800	57,000	5,000	18,000	21,000	0,300	1,400	4	5,003
6,000	6,000	5,700	57,000	6,000	20,000	21,000	1,000		4	6,000
6,000	6,000	5,700	57,000	6,000	20,000	21,000	0,300		4	6,003
6,000	6,000	5,700	57,000	6,000	20,000	21,000	0,500		4	6,005
6,000	6,000	5,700	57,000	6,000	20,000	21,000	1,500		4	6,015
8,000	8,000	7,700	63,000	8,000	26,000	27,000	1,000		4	8,000
8,000	8,000	7,700	63,000	8,000	26,000	27,000	0,500		4	8,005
8,000	8,000	7,700	63,000	8,000	26,000	27,000	2,000		4	8,020
10,000	10,000	9,500	72,000	10,000	30,000	32,000	1,500		4	10,000
10,000	10,000	9,500	72,000	10,000	30,000	32,000	0,500		4	10,005
10,000	10,000	9,500	72,000	10,000	30,000	32,000	1,000		4	10,010
12,000	12,000	11,500	83,000	12,000	36,000	38,000	1,500		4	12,000
12,000	12,000	11,500	83,000	12,000	36,000	38,000	0,500		4	12,005
12,000	12,000	11,500	83,000	12,000	36,000	38,000	1,000		4	12,010
12,000	12,000	11,500	83,000	12,000	36,000	38,000	2,000		4	12,020
16,000	16,000	15,500	92,000	16,000	42,000	44,000	2,000		4	16,000
16,000	16,000	15,500	92,000	16,000	42,000	44,000	3,000		4	16,030

Fräswerkzeuge

ISO	Härte	v _c	f _z (mm/z)/Ø														
			2	3	4	6	8	10	12								
P	≤ 850 N/mm ²	200	0,024	0,036	0,048	0,072	0,096	0,120	0,144	300	0,017	0,025	0,034	0,050	0,067	0,084	0,101
	≥ 850 N/mm ²	120	0,024	0,036	0,048	0,072	0,096	0,120	0,144		200	0,017	0,025	0,034	0,050	0,067	0,084
H	≤ 55 HRC	180	0,026	0,039	0,052	0,078	0,104	0,130	0,156	270	0,018	0,027	0,036	0,055	0,073	0,091	0,109
	55-63 HRC	90	0,020	0,030	0,040	0,060	0,080	0,100	0,120		160	0,013	0,020	0,026	0,039	0,052	0,065
K	≥ 240 HB	220	0,030	0,045	0,060	0,090	0,120	0,150	0,180	360	0,018	0,027	0,036	0,054	0,072	0,090	0,108

VHM Fräser

Kopierfräser mit Torusanschliff



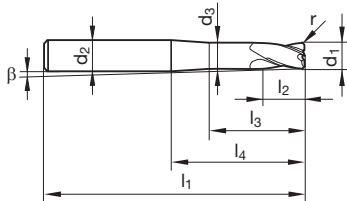
Katalog-Nr. 54305



P	M	K	N	S	H
○		●			●

Arbeitsrichtwerte
Seite 280-293

- lang
- Zentrumschnitt
- mit extra langer Reichweite für den Formenbau
- hohe Standzeiten durch hochharte Beschichtung
- bis 63 HRC



Fräserwerkzeuge

d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Code-Nr.
1,000	4,000	0,950	50,000	2,000	12,000	20,000	0,200	4,400	2	1,002
2,000	6,000	1,900	75,000	3,000	18,000	35,000	0,500	3,400	2	2,005
3,000	6,000	2,800	75,000	5,000	25,000	39,000	0,300	2,300	4	3,003
3,000	6,000	2,800	75,000	5,000	25,000	39,000	0,500	2,300	4	3,005
4,000	6,000	3,800	75,000	6,000	32,000	39,000	0,300	1,500	4	4,003
4,000	6,000	3,800	75,000	6,000	32,000	39,000	0,500	1,500	4	4,005
5,000	6,000	4,800	75,000	8,000	38,000	39,000	0,500	0,800	4	5,005
6,000	6,000	5,700	75,000	9,000	38,000	39,000	1,000		4	6,000
6,000	6,000	5,700	75,000	9,000	38,000	39,000	0,500		4	6,005
8,000	8,000	7,700	100,000	12,000	59,000	64,000	1,000		4	8,000
8,000	8,000	7,700	100,000	12,000	59,000	64,000	0,500		4	8,005
10,000	10,000	9,500	100,000	15,000	58,000	60,000	1,500		4	10,000
10,000	10,000	9,500	100,000	15,000	58,000	60,000	0,500		4	10,005
10,000	10,000	9,500	100,000	15,000	58,000	60,000	1,000		4	10,010
10,000	10,000	9,500	100,000	15,000	58,000	60,000	2,000		4	10,020
12,000	12,000	11,500	150,000	18,000	98,000	105,000	1,500		4	12,000
12,000	12,000	11,500	150,000	18,000	98,000	105,000	0,500		4	12,005
12,000	12,000	11,500	150,000	18,000	98,000	105,000	1,000		4	12,010
12,000	12,000	11,500	150,000	18,000	98,000	105,000	2,000		4	12,020
16,000	16,000	15,500	150,000	24,000	98,000	102,000	2,000		4	16,000

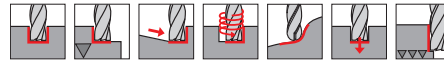
ISO	Härte	v _c	f _z (mm/z)/Ø							f _z (mm/z)/Ø										
			2	3	4	6	8	10	12	2	3	4	6	8	10	12				
P	≤ 850 N/mm ²	100	0,012	0,018	0,024	0,036	0,048	0,060	0,072		a _p = 0,1xD	a _e = 0,1xD	150	0,008	0,013	0,017	0,025	0,034	0,042	0,050
	≥ 850 N/mm ²	60	0,012	0,018	0,024	0,036	0,048	0,060	0,072				100	0,008	0,013	0,017	0,025	0,034	0,042	0,050
H	≤ 55 HRC	90	0,013	0,020	0,026	0,039	0,052	0,065	0,078		a _p = 0,01xD	a _e max = 0,01xD	135	0,009	0,014	0,018	0,027	0,036	0,046	0,055
	55-63 HRC	50	0,010	0,015	0,020	0,030	0,040	0,050	0,060				80	0,007	0,010	0,013	0,020	0,026	0,033	0,039
K	≥ 240 HB	220	0,030	0,045	0,060	0,090	0,120	0,150	0,180				360	0,018	0,027	0,036	0,054	0,072	0,090	0,108

VHM Fräser

Kopierfräser mit Torusanschliff



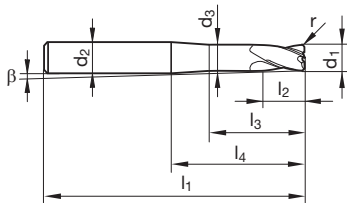
Katalog-Nr. 54302



P	M	K	N	S	H
●	●	●	○	●	○

Arbeitsrichtwerte
Seite 280-293

- zum Schruppen, Schlichten und Feinschlichten unter HSC-Bedingungen im Gesenk- und Formenbau
- Zentrumschnitt
- geeignet für Werkstoffe von 40 bis 54 HRC
- hohe Standzeiten durch hochharte Beschichtung



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Code-Nr.
0,500	4,000	0,480	50,000	1,000	3,000	22,000	0,100	4,600	2	0,501
1,000	4,000	0,950	50,000	2,000	6,000	22,000	0,200	4,000	2	1,002
2,000	6,000	1,900	57,000	3,000	8,000	21,000	0,500	5,600	2	2,000
2,000	6,000	1,900	57,000	3,000	8,000	21,000	0,200	5,500	2	2,002
3,000	6,000	2,800	57,000	3,500	14,000	21,000	0,500	4,200	2	3,000
4,000	6,000	3,800	57,000	4,000	16,000	21,000	1,000	2,900	2	4,000
4,000	6,000	3,800	57,000	4,000	16,000	21,000	0,300	2,800	2	4,003
4,000	6,000	3,800	57,000	4,000	16,000	21,000	0,500	2,800	2	4,005
5,000	6,000	4,800	57,000	5,000	18,000	21,000	0,500	1,400	2	5,005
5,000	6,000	4,800	57,000	5,000	18,000	21,000	1,000	1,500	2	5,010
6,000	6,000	5,700	57,000	6,000	20,000	21,000	2,000		2	6,000
6,000	6,000	5,700	57,000	6,000	20,000	21,000	0,500		2	6,005
6,000	6,000	5,700	57,000	6,000	20,000	21,000	1,000		2	6,010
6,000	6,000	5,700	57,000	6,000	20,000	21,000	1,500		2	6,015
8,000	8,000	7,700	63,000	8,000	26,000	27,000	2,000		2	8,000
8,000	8,000	7,700	63,000	8,000	26,000	27,000	0,500		2	8,005
8,000	8,000	7,700	63,000	8,000	26,000	27,000	1,000		2	8,010
10,000	10,000	9,500	72,000	10,000	30,000	32,000	3,000		2	10,000
10,000	10,000	9,500	72,000	10,000	30,000	32,000	0,500		2	10,005
10,000	10,000	9,500	72,000	10,000	30,000	32,000	1,500		2	10,015
12,000	12,000	11,500	83,000	12,000	36,000	38,000	4,000		2	12,000
12,000	12,000	11,500	83,000	12,000	36,000	38,000	2,000		2	12,020

ISO	Härte	v _c	f _z (mm/z)/Ø								v _c	f _z (mm/z)/Ø							
			a _p = 0,1xD				a _e = 0,1xD					a _p = 0,01xD				a _e max = 0,01xD			
			2	3	4	6	8	10	12		2	3	4	6	8	10	12		
P	≤ 850 N/mm ²	240	0,030	0,045	0,060	0,090	0,120	0,150	0,180	360	0,021	0,032	0,042	0,063	0,084	0,105	0,126		
	≥ 850 N/mm ²	200	0,024	0,036	0,048	0,072	0,096	0,120	0,144	300	0,017	0,025	0,034	0,050	0,067	0,084	0,101		
H	≤ 55 HRC	120	0,024	0,036	0,048	0,072	0,096	0,120	0,144	200	0,017	0,025	0,034	0,050	0,067	0,084	0,101		
M	≤ 750 N/mm ²	160	0,026	0,039	0,052	0,078	0,104	0,130	0,156	240	0,018	0,027	0,036	0,055	0,073	0,091	0,109		
	≥ 750 N/mm ²	80	0,020	0,030	0,040	0,060	0,080	0,100	0,120	130	0,013	0,020	0,026	0,039	0,052	0,065	0,078		
S	Ni-Basis	45	0,020	0,030	0,040	0,060	0,080	0,100	0,120	80	0,013	0,020	0,026	0,039	0,052	0,065	0,078		
	Ti-Basis	100	0,024	0,036	0,048	0,072	0,096	0,120	0,144	150	0,017	0,025	0,034	0,050	0,067	0,084	0,101		
K	≤ 240 HB	220	0,030	0,045	0,060	0,090	0,120	0,150	0,180	330	0,021	0,032	0,042	0,063	0,084	0,105	0,126		
	≥ 240 HB	180	0,026	0,039	0,052	0,078	0,104	0,130	0,156	270	0,018	0,027	0,036	0,055	0,073	0,091	0,109		
N	≥ 7 % Si	300	0,030	0,045	0,060	0,090	0,120	0,150	0,180	500	0,021	0,032	0,042	0,063	0,084	0,105	0,126		

Entgrat- und Faswerkzeuge

Entgratfräser 90°

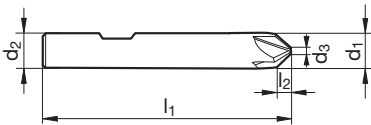


Katalog-Nr. 53399



P	M	K	N	S	H	Arbeitsrichtwerte Seite 280-293
●	●	●	●	●	○	

- Entgrat- und Anfasfräser, z.B. zur Bearbeitung von Werkstückkanten mit Faswinkel 90°
- höchste Vorschübe und bessere Oberfläche durch z = 6
- auch als Satz 322 044 176 erhältlich
- HA-Schaft auf Anfrage



d1 js9 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	Z	Code-Nr.
6,000	6,000	1,500	57,000	2,250	6	6,000
8,000	8,000	2,000	63,000	3,000	6	8,000
10,000	10,000	3,000	72,000	3,500	6	10,000
12,000	12,000	3,000	83,000	4,500	6	12,000
16,000	16,000	4,000	92,000	6,000	6	16,000
20,000	20,000	6,000	92,000	7,000	6	20,000

Fräserwerkzeuge

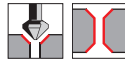
ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	192	0,018	0,036	0,048	0,06	0,08	0,10	0,13	250	0,030	0,060	0,080	0,11	0,13	0,17	0,21
	≥ 850 N/mm ²	140	0,016	0,032	0,042	0,06	0,07	0,09	0,12		180	0,026	0,053	0,070	0,10	0,12	0,16
M	≤ 750 N/mm ²	120	0,013	0,025	0,034	0,05	0,05	0,07	0,09	160	0,021	0,042	0,056	0,08	0,09	0,12	0,15
	≥ 750 N/mm ²	80	0,009	0,019	0,025	0,04	0,04	0,06	0,07		100	0,016	0,032	0,042	0,06	0,07	0,10
K	≤ 240 HB	170	0,017	0,033	0,044	0,06	0,07	0,09	0,12	230	0,028	0,056	0,074	0,10	0,12	0,16	0,20
N	≥ 7 % Si	250	0,023	0,047	0,062	0,08	0,10	0,13	0,17	330	0,039	0,078	0,104	0,14	0,17	0,22	0,28

Entgrat- und Faswerkzeuge

Entgratfräser 90°, spiralisiert

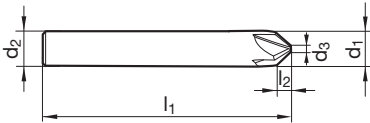


Katalog-Nr. 63399



P	M	K	N	S	H	Arbeitsrichtwerte Seite 280-293
●	●	○	●	●		

- Nutzung der vollen Schneidenlänge durch Stirnschnitt, Bearbeitung bis an den Bauteilboden
- weicher Schnitt und bessere Oberflächen bei großen Fasen durch positiven Spanwinkel und 5 unterschiedliche Spiralwinkel
- HB Spannfläche auf Anfrage möglich



d1 js9 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	Z	Code-Nr.
6,000	6,000	1,500	57,000	2,250	5	6,000
8,000	8,000	2,000	63,000	3,000	5	8,000
10,000	10,000	2,500	72,000	3,750	5	10,000
12,000	12,000	3,000	83,000	4,500	5	12,000
16,000	16,000	4,000	92,000	6,000	5	16,000
20,000	20,000	5,000	104,000	7,500	5	20,000

ISO	Härte	v _c	f _z (mm/z)/Ø							v _c	f _z (mm/z)/Ø						
			3	6	8	10	12	16	20		3	6	8	10	12	16	20
P	≤ 850 N/mm ²	192	0,018	0,036	0,048	0,06	0,08	0,10	0,13	250	0,030	0,060	0,080	0,11	0,13	0,17	0,21
	≥ 850 N/mm ²	140	0,016	0,032	0,042	0,06	0,07	0,09	0,12	180	0,026	0,053	0,070	0,10	0,12	0,16	0,20
M	≤ 750 N/mm ²	120	0,013	0,025	0,034	0,05	0,05	0,07	0,09	160	0,021	0,042	0,056	0,08	0,09	0,12	0,15
	≥ 750 N/mm ²	80	0,009	0,019	0,025	0,04	0,04	0,06	0,07	100	0,016	0,032	0,042	0,06	0,07	0,10	0,12
K	≤ 240 HB	170	0,017	0,033	0,044	0,06	0,07	0,09	0,12	230	0,028	0,056	0,074	0,10	0,12	0,16	0,20
N	≥ 7 % Si	250	0,023	0,047	0,062	0,08	0,10	0,13	0,17	330	0,039	0,078	0,104	0,14	0,17	0,22	0,28

Hartmetall-Reibwerkzeuge

VHM-Hochleistungs-Kopfreibahnen



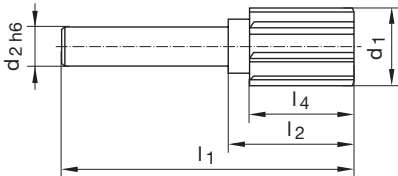
Katalog-Nr. 72874



P	M	K	N	S	H
•	•	○		•	•

Arbeitsrichtwerte
Seite 294

- für höchste Schnittwerte und hochwertige Bohrungsqualitäten
- mit axialem Kühlkanal, zur Bearbeitung von Grundbohrungen
- hohe Reibtiefevarianz durch Einsatz der Schrumpferlängerung (Kat.-Nr. 78719)
- Spannen in Hydrodehn- oder Schrumpffutter möglich



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
14,000	6,000	66,000	30,000	25,000	8	14,000
15,000	6,000	66,000	30,000	25,000	8	15,000
16,000	8,000	66,000	30,000	25,000	8	16,000
18,000	8,000	66,000	30,000	25,000	8	18,000
20,000	10,000	70,000	30,000	25,000	8	20,000
22,000	10,000	70,000	30,000	25,000	8	22,000
24,000	12,000	75,000	30,000	25,000	8	24,000
25,000	12,000	75,000	30,000	25,000	8	25,000
26,000	12,000	75,000	30,000	25,000	8	26,000
28,000	12,000	75,000	30,000	25,000	8	28,000
30,000	16,000	78,000	30,000	25,000	8	30,000
32,000	16,000	78,000	30,000	25,000	8	32,000
34,000	20,000	80,000	30,000	25,000	8	34,000
36,000	20,000	80,000	30,000	25,000	8	36,000
38,000	20,000	80,000	30,000	25,000	8	38,000
40,000	20,000	80,000	30,000	25,000	8	40,000
42,000	20,000	80,000	30,000	25,000	8	42,000

Hartmetall-Reibwerkzeuge

VHM-Hochleistungs-Kopfreibahlen



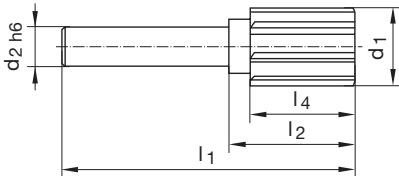
Katalog-Nr. 72875



P	M	K	N	S	H
●	●	○		●	●

Arbeitsrichtwerte
Seite 294

- für höchste Schnittwerte und hochwertige Bohrungsqualitäten
- mit radialer Kühlmittelzufuhr und Schälanschnitt zum gesicherten Spänetransport in die Vorschubrichtung bei der Bearbeitung von Durchgangsbohrungen
- hohe Reibtiefenvarianz durch Einsatz der Schrumpferlängerung (Kat.-Nr. 78719)
- Spannen in Hydrodehn- oder Schrumpffutter möglich



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
14,000	6,000	66,000	30,000	25,000	8	14,000
15,000	6,000	66,000	30,000	25,000	8	15,000
16,000	8,000	66,000	30,000	25,000	8	16,000
18,000	8,000	66,000	30,000	25,000	8	18,000
20,000	10,000	70,000	30,000	25,000	8	20,000
22,000	10,000	70,000	30,000	25,000	8	22,000
24,000	12,000	75,000	30,000	25,000	8	24,000
25,000	12,000	75,000	30,000	25,000	8	25,000
26,000	12,000	75,000	30,000	25,000	8	26,000
28,000	12,000	75,000	30,000	25,000	8	28,000
30,000	16,000	78,000	30,000	25,000	8	30,000
32,000	16,000	78,000	30,000	25,000	8	32,000
34,000	20,000	80,000	30,000	25,000	8	34,000
36,000	20,000	80,000	30,000	25,000	8	36,000
38,000	20,000	80,000	30,000	25,000	8	38,000
40,000	20,000	80,000	30,000	25,000	8	40,000
42,000	20,000	80,000	30,000	25,000	8	42,000

Hartmetall-Reibwerkzeuge

VHM-Hochleistungs-Reibahlen

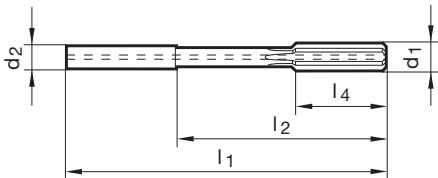


Katalog-Nr. 72876



Arbeitsrichtwerte
Seite 294

- mit axialem Kühlkanal, zur Bearbeitung von Grundbohrungen
- für höchste Schnittwerte und hochwertige Bohrungsqualitäten
- gerade genutet, mit extrem ungleicher Teilung
- Zylinderschaft Tol. h6 zur Aufnahme in Hydraulik-Dehnspann- oder Schrumpffutter
- erhebliche Einsparpotenziale bei den Prozesskosten möglich
- die DLC-Beschichtung verhindert die Bildung von Aufbauschnitten
Durchmesserschwankungen bei bester Oberflächenqualität der geriebenen Bohrung werden so vermieden



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
4,000	4,000	68,000	40,000	12,000	4	4,000
5,000	6,000	76,000	40,000	12,000	4	5,000
6,000	6,000	76,000	40,000	12,000	4	6,000
7,000	8,000	101,000	65,000	16,000	6	7,000
8,000	8,000	101,000	65,000	16,000	6	8,000
10,000	10,000	101,000	61,000	19,000	6	10,000
12,000	12,000	130,000	85,000	19,000	6	12,000
14,000	14,000	130,000	85,000	22,000	6	14,000
16,000	16,000	150,000	102,000	22,000	6	16,000
18,000	18,000	150,000	102,000	25,000	6	18,000
20,000	20,000	150,000	100,000	25,000	6	20,000

Hartmetall-Reibwerkzeuge

VHM-Hochleistungs-Reibahlen

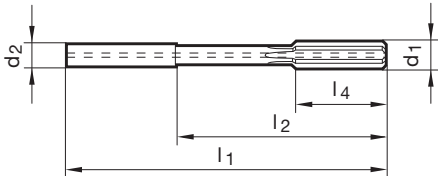


Katalog-Nr. 72877



Arbeitsrichtwerte
Seite 294

- für höchste Schnittwerte und hochwertige Bohrungsqualitäten
- gerade genutet, mit extrem ungleicher Teilung
- Zylinderschaft Tol. h6 zur Aufnahme in Hydraulik-Dehnspann- oder Schrumpffutter
- erhebliche Einsparpotenziale bei den Prozesskosten möglich
- die DLC-Beschichtung verhindert die Bildung von Aufbauschneiden
Durchmesserschwankungen bei bester Oberflächenqualität der geriebenen Bohrung werden so vermieden



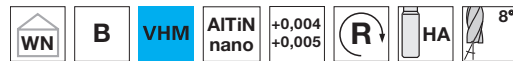
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
4,000	4,000	68,000	40,000	12,000	4	4,000
5,000	6,000	76,000	40,000	12,000	4	5,000
6,000	6,000	76,000	40,000	12,000	4	6,000
7,000	8,000	101,000	65,000	16,000	6	7,000
8,000	8,000	101,000	65,000	16,000	6	8,000
10,000	10,000	101,000	61,000	19,000	6	10,000
12,000	12,000	130,000	85,000	19,000	6	12,000
14,000	14,000	130,000	85,000	22,000	6	14,000
16,000	16,000	150,000	102,000	22,000	6	16,000
18,000	18,000	150,000	102,000	25,000	6	18,000
20,000	20,000	150,000	100,000	25,000	6	20,000

Hartmetall-Reibwerkzeuge

VHM NC-Maschinen-Reibbahlen



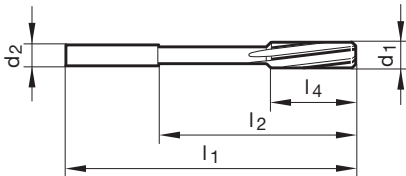
Katalog-Nr. 52920



P	M	K	N	S	H
•	•	•		•	○

Arbeitsrichtwerte
Seite 294

- > Ø 3,75 mm mit extrem ungleicher Teilung
- ≤ Ø 5,50 mm: 0,000/+0,004
- > Ø 5,50 mm: 0,000/+0,005
- Zylinderschaft Tol. h6 zur Aufnahme in Hydraulik-Dehnspann- oder Schrumpffutter
- AlTiNnano-Beschichtung für höchste Standzeiten und Oberflächenqualität der Bohrungen
- für Serienfertigung



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
0,980	4,000	50,000	22,000	6,000	3	0,980
0,990	4,000	50,000	22,000	6,000	3	0,990
1,000	4,000	50,000	22,000	6,000	3	1,000
1,010	4,000	50,000	22,000	6,000	3	1,010
1,020	4,000	50,000	22,000	6,000	3	1,020
1,030	4,000	50,000	22,000	9,000	3	1,030
1,480	4,000	50,000	22,000	9,000	3	1,480
1,490	4,000	50,000	22,000	9,000	3	1,490
1,500	4,000	50,000	22,000	9,000	3	1,500
1,510	4,000	50,000	22,000	9,000	3	1,510
1,520	4,000	50,000	22,000	9,000	3	1,520
1,530	4,000	50,000	22,000	9,000	3	1,530
1,980	4,000	50,000	22,000	12,000	4	1,980
1,990	4,000	50,000	22,000	12,000	4	1,990
2,000	4,000	50,000	22,000	12,000	4	2,000
2,010	4,000	50,000	22,000	12,000	4	2,010
2,020	4,000	50,000	22,000	12,000	4	2,020
2,030	4,000	50,000	22,000	12,000	4	2,030
2,480	4,000	60,000	32,000	16,000	4	2,480
2,490	4,000	60,000	32,000	16,000	4	2,490
2,500	4,000	60,000	32,000	16,000	4	2,500
2,510	4,000	60,000	32,000	16,000	4	2,510
2,520	4,000	60,000	32,000	16,000	4	2,520
2,530	4,000	60,000	32,000	16,000	4	2,530
2,970	4,000	64,000	36,000	17,000	6	2,970
2,980	4,000	64,000	36,000	17,000	6	2,980
2,990	4,000	64,000	36,000	17,000	6	2,990
3,000	4,000	64,000	36,000	17,000	6	3,000
3,010	4,000	64,000	36,000	17,000	6	3,010
3,020	4,000	64,000	36,000	17,000	6	3,020
3,030	4,000	64,000	36,000	17,000	6	3,030
3,970	4,000	77,000	45,000	21,000	6	3,970
3,980	4,000	77,000	45,000	21,000	6	3,980
3,990	4,000	77,000	45,000	21,000	6	3,990
4,000	4,000	77,000	45,000	21,000	6	4,000
4,010	4,000	77,000	45,000	21,000	6	4,010
4,020	4,000	77,000	45,000	21,000	6	4,020
4,030	4,000	77,000	45,000	21,000	6	4,030
4,970	6,000	93,000	59,000	26,000	6	4,970
4,980	6,000	93,000	59,000	26,000	6	4,980
4,990	6,000	93,000	59,000	26,000	6	4,990
5,000	6,000	93,000	59,000	26,000	6	5,000
5,010	6,000	93,000	59,000	26,000	6	5,010
5,020	6,000	93,000	59,000	26,000	6	5,020
5,030	6,000	93,000	59,000	26,000	6	5,030
5,970	6,000	93,000	57,000	26,000	6	5,970
5,980	6,000	93,000	57,000	26,000	6	5,980
5,990	6,000	93,000	57,000	26,000	6	5,990

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
6,000	6,000	93,000	57,000	26,000	6	6,000
6,010	6,000	93,000	57,000	26,000	6	6,010
6,020	6,000	93,000	57,000	26,000	6	6,020
6,030	6,000	93,000	57,000	26,000	6	6,030
7,000	8,000	109,000	69,000	31,000	6	7,000
7,970	8,000	117,000	75,000	33,000	6	7,970
7,980	8,000	117,000	75,000	33,000	6	7,980
7,990	8,000	117,000	75,000	33,000	6	7,990
8,000	8,000	117,000	75,000	33,000	6	8,000
8,010	8,000	117,000	75,000	33,000	6	8,010
8,020	8,000	117,000	75,000	33,000	6	8,020
8,030	8,000	117,000	75,000	33,000	6	8,030
8,040	8,000	117,000	75,000	33,000	6	8,040
9,000	10,000	125,000	81,000	36,000	6	9,000
9,970	10,000	133,000	87,000	38,000	6	9,970
9,980	10,000	133,000	87,000	38,000	6	9,980
9,990	10,000	133,000	87,000	38,000	6	9,990
10,000	10,000	133,000	87,000	38,000	6	10,000
10,010	10,000	133,000	87,000	38,000	6	10,010
10,020	10,000	133,000	87,000	38,000	6	10,020
10,030	10,000	133,000	87,000	38,000	6	10,030
10,040	10,000	133,000	87,000	38,000	6	10,040
10,050	10,000	133,000	87,000	38,000	6	10,050
11,970	12,000	151,000	105,000	44,000	6	11,970
11,980	12,000	151,000	105,000	44,000	6	11,980
11,990	12,000	151,000	105,000	44,000	6	11,990
12,000	12,000	151,000	105,000	44,000	6	12,000
12,010	12,000	151,000	105,000	44,000	6	12,010
12,020	12,000	151,000	105,000	44,000	6	12,020
12,030	12,000	151,000	105,000	44,000	6	12,030
12,040	12,000	151,000	105,000	44,000	6	12,040
12,050	12,000	151,000	105,000	44,000	6	12,050

Hartmetall-Reibwerkzeuge

VHM NC-Maschinen-Reibbahlen



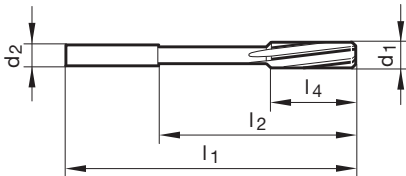
Katalog-Nr. 52930



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 294

- > Ø 3,75 mm mit extrem ungleicher Teilung
- Zylinderschaft Tol. h6 zur Aufnahme in Hydraulik-Dehnspann- oder Schrumpffutter
- AlTiNnano-Beschichtung für höchste Standzeiten und Oberflächenqualität der Bohrungen



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code-Nr.
3,000	4,000	64,000	36,000	17,000	6	3,000
3,500	4,000	74,000	46,000	20,000	6	3,500
4,000	4,000	77,000	45,000	21,000	6	4,000
4,500	6,000	82,000	50,000	23,000	6	4,500
5,000	6,000	93,000	59,000	26,000	6	5,000
5,500	6,000	93,000	57,000	26,000	6	5,500
6,000	6,000	93,000	57,000	26,000	6	6,000
6,500	8,000	101,000	63,000	28,000	6	6,500
7,000	8,000	109,000	69,000	31,000	6	7,000
7,500	8,000	109,000	69,000	31,000	6	7,500
8,000	8,000	117,000	75,000	33,000	6	8,000
8,500	10,000	117,000	75,000	33,000	6	8,500
9,000	10,000	125,000	81,000	36,000	6	9,000
9,500	10,000	125,000	81,000	36,000	6	9,500
10,000	10,000	133,000	87,000	38,000	6	10,000
10,500	10,000	133,000	87,000	38,000	6	10,500
11,000	10,000	142,000	96,000	41,000	6	11,000
11,500	10,000	142,000	96,000	41,000	6	11,500
12,000	12,000	151,000	105,000	44,000	6	12,000
13,000	14,000	160,000	114,000	44,000	6	13,000
14,000	14,000	160,000	110,000	47,000	6	14,000
15,000	16,000	170,000	120,000	50,000	6	15,000
16,000	16,000	170,000	120,000	52,000	6	16,000
17,000	18,000	182,000	130,000	52,000	6	17,000
18,000	18,000	182,000	130,000	52,000	6	18,000
19,000	20,000	195,000	137,000	52,000	6	19,000
20,000	20,000	195,000	137,000	52,000	6	20,000

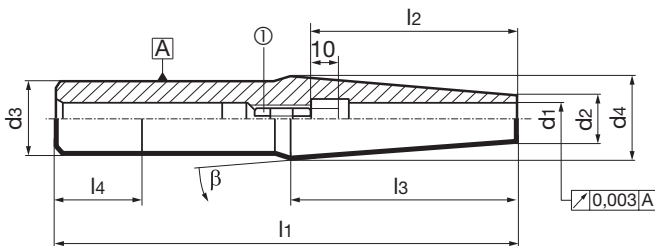
Schrumpffutter

Schrumpfverlängerungen



Katalog-Nr. 78719

- zur Aufnahme im Hydraulik-Dehnspannfutter oder Schrumpffutter
- geeignet für Innenkühlung
- für d1 h6 Hartmetall-Werkzeugschäfte (ab d1 14 mm auch HSS möglich)
- Sonderausführungen auf Anfrage
- auch geeignet zum Einsatz mit Kat.-Nr. 72874 und 72875



d1 mm	d2 mm	d3 mm	d4 mm	l1 mm	l2 mm	l3 mm	l4 mm	β °	Code-Nr.
3	10	20	20	160	30	71,5	88	4	3,120
4	10	20	20	160	35	71,5	88	4	4,120
5	10	20	20	160	40	71,5	88	4	5,120
6	14	20	20	160	36	42,9	117	4	6,120
8	14	20	20	160	36	42,9	117	4	8,120
10	20	25	25	160	41	35,8	124	4	10,125
12	20	25	25	160	46	35,8	124	4	12,125
14	20	25	29	160	46	74,9	85	4	14,125
16	22	25	33	160	49	82,7	77	4	16,125
18	27	32	32	160	49	35,8	124	4	18,132
20	27	32	32	160	51	35,8	124	4	20,132
3	10	20	20	200	30	71,5	128	4	3,220
4	10	20	20	200	35	71,5	128	4	4,220
5	10	20	20	200	40	71,5	128	4	5,220
6	14	20	20	200	36	42,9	157	4	6,220
8	14	20	20	200	36	42,9	157	4	8,220
10	20	25	25	200	41	35,8	164	4	10,225
12	20	25	25	200	46	35,8	164	4	12,225
14	20	32	32	200	46	85,8	114	4	14,232
16	24	32	32	200	49	57,2	142	4	16,232
18	27	32	32	200	49	35,8	164	4	18,232
20	27	32	32	200	51	35,8	164	4	20,232
6	10	12	12	125	38	19,1	105	3	6,012
8	12	14	14	125	38	19,1	105	3	8,014
10	14	16	16	160	42	19,1	140	3	10,116
12	16	20	20	160	47	38,2	121	3	12,120
16	22	25	25	160	50	28,6	131	3	16,225
20	27	32	32	160	52	47,7	112	3	20,332
6	10	12	12	200	38	153,0	47	3	6,312
8	12	14	14	200	38	153,0	47	3	8,314
10	14	16	16	250	42	200,0	50	3	10,316
12	16	20	20	250	47	198,0	52	3	12,320
16	22	25	25	250	50	192,0	58	3	16,325
20	27	32	32	250	52	188,0	62	3	20,432

HSS-Co Senkwerkzeuge

Kegelsenker 90° V-NX



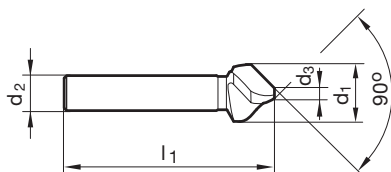
Katalog-Nr. 52348



P	M	K	N	S	H
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Arbeitsrichtwerte
Seite 296

- 3 ungleiche, konvexe Schneiden
- vibrationsarmes Schneiden
- für runde und ratterfreie Senkungen
- deutlich reduzierte Vorschubkraft
- universell einsetzbar



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code-Nr.
6,300	5,000	1,500	45,000	3	6,300
8,000	6,000	2,000	50,000	3	8,000
8,300	6,000	2,000	50,000	3	8,300
10,000	6,000	2,500	50,000	3	10,000
10,400	6,000	2,500	50,000	3	10,400
11,500	8,000	2,800	56,000	3	11,500
12,400	8,000	2,800	56,000	3	12,400
15,000	10,000	3,200	60,000	3	15,000
16,500	10,000	3,200	60,000	3	16,500
19,000	10,000	3,500	63,000	3	19,000
20,500	10,000	3,500	63,000	3	20,500
23,000	10,000	3,800	67,000	3	23,000
25,000	10,000	3,800	67,000	3	25,000
31,000	12,000	4,200	71,000	3	31,000
40,000	12,000	10,000	75,000	3	40,000

HSS-Co Senkwerkzeuge

Kegelsenker 90° V-NX

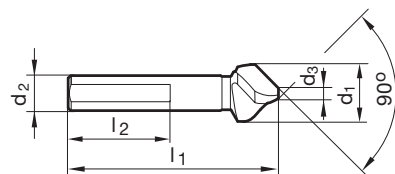


Katalog-Nr. 52350



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 296



- 3-Flächen-Schaft verhindert Durchrutschen im Bohrfutter
- 3 ungleiche, konvexe Schneiden
- optimal für Handbohrmaschinen
- vibrationsarmes Schneiden
- für runde und ratterfreie Senkungen
- deutlich reduzierte Vorschubkraft
- universell einsetzbar

d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	Z	Code-Nr.
6,300	5,000	1,500	45,000	30,000	3	6,300
8,000	6,000	2,000	50,000	30,000	3	8,000
8,300	6,000	2,000	50,000	30,000	3	8,300
10,000	6,000	2,500	50,000	30,000	3	10,000
10,400	6,000	2,500	50,000	30,000	3	10,400
11,500	8,000	2,800	56,000	30,000	3	11,500
12,400	8,000	2,800	56,000	30,000	3	12,400
15,000	10,000	3,200	60,000	30,000	3	15,000
16,500	10,000	3,200	60,000	30,000	3	16,500
19,000	10,000	3,500	63,000	30,000	3	19,000
20,500	10,000	3,500	63,000	30,000	3	20,500
23,000	10,000	3,800	67,000	30,000	3	23,000
25,000	10,000	3,800	67,000	30,000	3	25,000
31,000	12,000	4,200	71,000	30,000	3	31,000
40,000	12,000	10,000	75,000	30,000	3	40,000

HSS-Co Senkwerkzeuge

Kegelsenkersätze 90° V-NX



V-NX	DIN 335	C	HSCO	Al-TiN	90°	R	Cyl
P	M	K	N	S	H		
•	•	•	○	○			

Arbeitsrichtwerte
Seite 296

- bestehend aus Katalog-Nr. 52348
- 3 ungleiche, konvexe Schneiden
- vibrationsarmes Schneiden
- für runde und ratterfreie Senkungen
- deutlich reduzierte Vorschubkraft
- universell einsetzbar

Katalog-Nr. 52398

Code-Nr.	Ø-Bereich mm	Stück/Satz
1,000	6,3/8,3/10,4/12,4/16,5/20,5	6

HSS-Co Senkwerkzeuge

Kegelsenkersätze 90° V-NX



P	M	K	N	S	H
●	●	●	○	○	

Arbeitsrichtwerte
Seite 296

- bestehend aus Katalog-Nr. 52350
- 3-Flächen-Schaft verhindert Durchrutschen im Bohrfutter
- 3 ungleiche, konvexe Schneiden
- optimal für Handbohrmaschinen
- vibrationsarmes Schneiden
- für runde und ratterfreie Senkungen
- deutlich reduzierte Vorschubkraft
- universell einsetzbar

Katalog-Nr. 52399

Code-Nr.	Ø-Bereich mm	Stück/Satz
1,000	6,3/8,3/10,4/12,4/16,5/20,5	6

ARBEITS- RICHTWERTE





SuperV-Bohrer

Arbeitsrichtwerte

Vorschubreihen										
Code-Buchstabe	A	B	C	D	E	F	G	H	I	
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Bedeutung der Kennbuchstaben bei den Typbezeichnungen:

- S** für hochfeste Werkstoffe
- U** für Universalbearbeitung, Kohlenstoffstähle
- VA** für rostfreie Werkstoffe
- X** für Aluminium
- AL** für Stahlbearbeitung
- T** für Tieflochbohrer

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		<input checked="" type="checkbox"/>
austenitisch	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850		<input checked="" type="checkbox"/>
martensitisch	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		<input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Temperguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input checked="" type="checkbox"/>
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch	Epoxidharz, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
thermoplastisch	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt	Kevlar		-	<input type="checkbox"/>
glas-/kohlefaserverstärkt	GFK/CFK		-	<input type="checkbox"/>

≤3×D Bohrtiefe

≤5×D Bohrtiefe

Katalog-Nr.	51673	51676	51670	51687	51681	51674	71791
Schneidstoff	VHM	VHM	VHM	VHM	VHM	VHM	VHM
HM-Anwendgsgr.	K/P	K/P	K/P	K/P	K/P	K/P	K/P
Oberfläche	TiAlN nano	TiAlN nano	TiAlN nano	TiAlN nano	TiAlN nano	TiAlN nano	blank
DIN/Form	6537K	6537K	6537K	6537L	6537L	6537L	6537L
Typ	U	U	VA	U	U	VA	AI
Innenkühlung	ohne	mit	mit	ohne	mit	mit	mit
Katalogseite	23	29	31	27	43	45	41



V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code
130	G	145	G			130	G	145	G				
110	F	120	F			110	F	120	F				
145	H	170	H			145	H	170	H				
110	G	145	H			110	G	145	H				
120	G	130	H			120	G	130	H				
110	G	125	G			110	G	125	G				
105	G	120	G			105	G	120	G				
105	G	120	G			105	G	120	G				
100	F	105	G			100	F	105	G				
130	H	145	H			130	H	145	H				
120	G	120	G			120	G	120	G				
85	E	85	E			85	E	85	E				
100	F	110	G			100	F	105	G				
90	E	105	E			90	E	100	E				
65	F	80	F			65	F	70	F				
55	E	65	E			55	E	55	E				
55		60	D			55		60	E				
45	C	60	C			45	C	60	C				
40	A	55	C			35	A	55	C				
20	A	35	B			20	A	35	B				
40	B	60	E	80	E	45	B	60	E	80	E		
15	A	55	B	60	B-C	15	A	55	B	60	B-C		
35	B	45	E	80	E	35	B	50	E	80	E		
210	H	210	I			210	H	195	I				
155	H	160	I			155	H	160	I				
155	G	140	I			145	G	140	I				
125	G	130	H			125	G	130	H				
35	C	40	C			35	C	40	C				
25	D	35	D	30	D	25	D	35	D	30	D		
15	A	45	D	45	D	15	A	45	D	45	D		
15	A	40	C	40	C	15	A	40	C	40	C		
260	I	310	I			260	I	310	I			350	I
260	I	310	I			260	I	310	I			350	I
220	H	260	I			235	I	260	I			320	H
180	H	220	I			170	H	220	I			280	G
260	H	280	H			260	H	280	H			320	G
105	G	125	G			105	G	125	G			190	G
270	H	325	H			270	H	325	H			160	F
180	G	220	G			180	G	220	G			160	F
105	F	125	G			105	F	125	G			160	F
85	F	105	F			85	F	105	F			160	F
80	E	90	F			80	E	90	F			150	F
60	E	80	F			60	E	80	F			150	F
												100	C
												100	C
												100	B

Arbeitsrichtwerte

SuperV-Bohrer

Arbeitsrichtwerte

Vorschubreihen										
Code-Buchstabe	A	B	C	D	E	F	G	H	I	
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Bedeutung der Kennbuchstaben bei den Typbezeichnungen:

- S** für hochfeste Werkstoffe
- U** für Universalbearbeitung, Kohlenstoffstähle
- VA** für rostfreie Werkstoffe
- X** für Aluminium
- AL** für Stahlbearbeitung
- T** für Tieflochbohrer

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Temperguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Messing, kurzspanend langspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch thermoplastisch	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon		-	<input type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt glas-/kohlefaserverstärkt	Kevlar GFK/CFK		-	<input type="checkbox"/> <input type="checkbox"/>

SuperV-Bohrer

Arbeitsrichtwerte

Vorschubreihen										
Code-Buchstabe	A	B	C	D	E	F	G	H	I	
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Bedeutung der Kennbuchstaben bei den Typbezeichnungen:

- S** für hochfeste Werkstoffe
- U** für Universalbearbeitung, Kohlenstoffstähle
- VA** für rostfreie Werkstoffe
- X** für Stahlbearbeitung
- AL** für Aluminium
- T** für Tieflochbohrer

Einsatzhinweise SuperV-T-Bohrer:

Um bei tiefen Bohrungen optimale Bearbeitungsergebnisse zu erzielen, empfehlen wir:

- Herstellen einer zylindrischen Pilotbohrung (Toleranz F9), Bohrtiefe 1 x D mit unseren SuperV-Bohrern Typ U bzw. VA (140° Spitzwinkel, Ø-Toleranz m7). Alternativ kann auch der Pilotbohrfräser Artikel-Nr. 54700 eingesetzt werden.
- Einfahren in Pilotbohrung: Drehzahl ca. 300 U/min, Vorschub ca. 500 mm/min.
- Einstellen des Kühlschmierstoffdruckes und der Drehzahl.
- Kontinuierliches Bohren auf volle Bohrtiefe ohne Entspanzyklus.
- Bei Durchgangsbohrungen mit geradem (90°) Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 50% reduzieren.
- Bei Durchgangsbohrungen mit schrägem Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 40% reduzieren.
- Nach Erreichen der Bohrtiefe Drehzahl und Kühlschmierstoff abschalten, Ausfahren im Eilgang.

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Tempereguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Messing, kurzspanend langspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch thermoplastisch	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon		-	<input type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt glas-/kohlefaserverstärkt	Kevlar GFK/CFK		-	<input type="checkbox"/> <input type="checkbox"/>

≤3×D

≤5×D

≤7×D

≤12×D

≤3×D Pilotbohrer

Katalog-Nr.	51784
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	6537K
Typ	X
Innenkühlung	mit
Katalogeseite	33

Katalog-Nr.	51786
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	6537L
Typ	X
Innenkühlung	mit
Katalogeseite	47

Katalog-Nr.	51791
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	WN
Typ	X
Innenkühlung	mit
Katalogeseite	53

Katalog-Nr.	51792
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	WN
Typ	X
Innenkühlung	mit
Katalogeseite	56

Katalog-Nr.	51718
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	WN
Typ	SuperV-180
Innenkühlung	mit
Katalogeseite	39



V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code
200	H	200	H	180	H	180	H	100	D
200	G	200	G	180	G	180	G	85	D
200	H	200	H	180	H	180	H	110	D
200	H	200	H	180	H	180	H	85	D
180	H	180	H	160	H	160	H	90	D
160	H	160	H	140	H	140	H	85	D
130	H	130	H	120	H	120	H	80	D
120	H	120	H	110	H	110	H	80	D
120	G	120	G	110	G	110	G	75	D
180	H	180	H	160	H	160	H	100	D
120	H	120	H	110	H	110	H	90	D
110	G	110	G	100	G	100	G	65	D
110	G	110	G	100	G	100	G	75	D
100	E	100	E	90	E	90	E	70	D
90	G	90	G	80	G	80	G	50	D
65	F	65	F	60	F	60	F	40	D
60	E	60	E	55	E	55	E	40	D
60	E	60	E	55	E	55	E	35	D
55	C	55	C	45	C	45	C	35	A
80	E	80	E	70	E	70	E	40	C
								15	C
60	E	60	E	50	E	50	E	35	C
180	I	180	I	165	I	165	I	160	D
160	I	160	I	145	I	145	I	120	D
140	I	140	I	130	I	130	I	120	D
140	H	140	H	130	H	130	H	95	D
								25	B
140	H	140	H	130	H	130	H	100	D
140	H	140	H	130	H	130	H	90	D
80	G	80	G	70	G	70	G	80	C
80	G	80	G	70	G	70	G	70	C
30	D	30	D	25	D	25	D	20	C
40	D	40	D	35	D	35	D	15	C
35	C	35	C	30	C	30	C	15	C
								200	D
								200	D
								170	D
								140	D
								200	D
								80	D
								210	D
								140	D
								80	D
								65	C
								60	C
								45	C

Arbeitsrichtwerte

SuperV-Bohrer

Arbeitsrichtwerte

Vorschubreihen										
Code-Buchstabe	A	B	C	D	E	F	G	H	I	
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Bedeutung der Kennbuchstaben bei den Typbezeichnungen:

- S** für hochfeste Werkstoffe
- U** für Universalbearbeitung, Kohlenstoffstähle
- VA** für rostfreie Werkstoffe
- X** für Stahlbearbeitung
- AL** für Aluminium
- T** für Tieflochbohrer

Einsatzhinweise SuperV-T-Bohrer:

Um bei tiefen Bohrungen optimale Bearbeitungsergebnisse zu erzielen, empfehlen wir:

- Herstellen einer zylindrischen Pilotbohrung (Toleranz F9), Bohrtiefe 1 x D mit unseren SuperV-Bohrern Typ U bzw. VA (140° Spitzwinkel, Ø-Toleranz m7). Alternativ kann auch der Pilotbohrfräser Artikel-Nr. 54700 eingesetzt werden.
- Einfahren in Pilotbohrung: Drehzahl ca. 300 U/min, Vorschub ca. 500 mm/min.
- Einstellen des Kühlschmierstoffdruckes und der Drehzahl.
- Kontinuierliches Bohren auf volle Bohrtiefe ohne Entspanzyklus.
- Bei Durchgangsbohrungen mit geradem (90°) Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 50% reduzieren.
- Bei Durchgangsbohrungen mit schrägem Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 40% reduzieren.
- Nach Erreichen der Bohrtiefe Drehzahl und Kühlschmierstoff abschalten, Ausfahren im Eilgang.

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Tempereguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Messing, kurzspanend langspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch thermoplastisch	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon		- -	<input type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt glas-/kohlefaserverstärkt	Kevlar GFK/CFK		- -	<input type="checkbox"/> <input type="checkbox"/>

SuperV-Bohrer

Arbeitsrichtwerte

		Vorschubreihen								
Code-Buchstabe	A	B	C	D	E	F	G	H	I	
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Bedeutung der Kennbuchstaben bei den Typbezeichnungen:

- S** für hochfeste Werkstoffe
- U** für Universalbearbeitung, Kohlenstoffstähle
- VA** für rostfreie Werkstoffe
- X** für Stahlbearbeitung
- AL** für Aluminium
- T** für Tieflochbohrer

Einsatzhinweise SuperV-T-Bohrer:

Um bei tiefen Bohrungen optimale Bearbeitungsergebnisse zu erzielen, empfehlen wir:

- Herstellen einer zylindrischen Pilotbohrung (Toleranz F9), Bohrtiefe 1 x D mit unseren SuperV-Bohrern Typ U bzw. VA (140° Spitzwinkel, Ø-Toleranz m7). Alternativ kann auch der Pilotbohrfräser Artikel-Nr. 54700 eingesetzt werden.
- Einfahren in Pilotbohrung: Drehzahl ca. 300 U/min, Vorschub ca. 500 mm/min.
- Einstellen des Kühlschmierstoffdruckes und der Drehzahl.
- Kontinuierliches Bohren auf volle Bohrtiefe ohne Entspanzyklus.
- Bei Durchgangsbohrungen mit geradem (90°) Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 50% reduzieren.
- Bei Durchgangsbohrungen mit schrägem Austritt, v_f ca. 1 mm vor dem Durchbrechen auf 40% reduzieren.
- Nach Erreichen der Bohrtiefe Drehzahl und Kühlschmierstoff abschalten, Ausfahren im Eilgang.

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

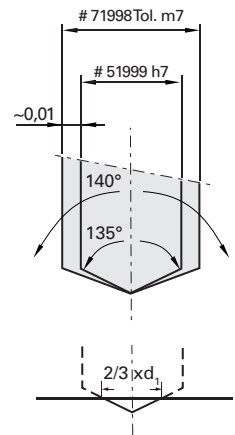
Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Tempereguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Messing, kurzspanend langspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch thermoplastisch	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon		-	<input type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt glas-/kohlefaserverstärkt	Kevlar GFK/CFK		-	<input type="checkbox"/> <input type="checkbox"/>

SuperV-NX Hochleistungs-Kleinstbohrer

Arbeitsrichtwerte

Vorschubreihen für Hochleistungs-Kleinstbohrer

Vorschub-Code	A	B	C	D	E	F	G	H	I	J	K	L	M	
Werkzeug-Ø mm	0,50	0,006	0,012	0,018	0,022	0,030	0,035	0,040	0,045	0,050	0,050	0,055	0,060	0,060
	0,80	0,008	0,016	0,024	0,032	0,040	0,050	0,060	0,070	0,080	0,080	0,080	0,090	0,090
	1,00	0,012	0,022	0,032	0,042	0,060	0,070	0,080	0,090	0,100	0,100	0,110	0,110	0,120
	1,50	0,021	0,036	0,051	0,066	0,090	0,100	0,120	0,130	0,150	0,150	0,160	0,170	0,180
	2,00	0,032	0,052	0,072	0,092	0,120	0,140	0,160	0,180	0,200	0,210	0,220	0,230	0,240
	2,50	0,045	0,070	0,095	0,120	0,150	0,170	0,200	0,220	0,250	0,260	0,270	0,280	0,300
	3,00	0,060	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300	0,310	0,330	0,340	0,360



Werkzeuge mit **fett gedruckten** Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Sicherheitshinweise: Enorm wichtig ist, dass aus Sicherheitsgründen kein Bohrer ohne Abstützung mit einer höheren Drehzahl als $n = 6.000$ U/min frei drehen darf. Die Zentrifugalkräfte könnten sonst die langen Werkzeuge schon vor dem Erreichen der Werkstückoberfläche brechen!

Allgemeine Hinweise: Spielarme Spindeln, fluchtgenaue Werkzeugaufnahmen. Wir empfehlen die Anwendung von Hydraulik-Dehnspannfuttern oder Schrumpffuttern sowie Kühlschmierung durch Emulsion oder Öl, Druck min. 40 bar.

Pilotbohrung

Beim Einsatz des SuperV-NX-Bohrers ab 15xD empfehlen wir die Herstellung einer Pilotbohrung mit 1xD bis 2xD Tiefe. Der SuperV-NX-Bohrer 4xD ist optimal für diese Pilotbohrung geeignet. Sein Spitzenwinkel und seine Durchmesser-toleranz sind darauf abgestimmt.

Zentrieren

Um bei den SuperV-NX-Bohrern ab 8xD Bohrtiefe die volle Leistung zu erreichen, empfehlen wir das Zentrieren. Hierzu kann der SuperV-NX-Bohrer bis 4xD, Katalog-Nr. 71998, verwendet werden. Der Zentrierdurchmesser sollte ca. 2/3xD haben. Alternativ kann die Zentrierung auch mit dem Stock NC-Anbohrer 142°, Katalog-Nr. 71189, erstellt werden.

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert ■
- Bohrölemulsion ■
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	■
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■
Kugelgraphit- und Temporguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Hartguss	-		≤350 HB	■
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		■
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		■
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn Pb	≤400		■
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		■
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		■
Bronzen, kurzspanend	2.1090 CuSn7Zn Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		■
langspanend	2.0790 CuNi18Zn19Pb	>600-850		■
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■

$\leq 5 \times D$
 $\leq 8 \times D$
 $\leq 15 \times D$
 $\leq 20 \times D$

Katalog-Nr.	51720
Schneidstoff	VHM
Oberfläche	AlTiN
DIN/Form	WN
Typ	M
Innenkühlung	ohne
Katalogseite	69

Katalog-Nr.	51997
Schneidstoff	VHM
Oberfläche	AlTiN
DIN/Form	WN
Typ	NX
Innenkühlung	mit
Katalogseite	71

Katalog-Nr.	51998
Schneidstoff	VHM
Oberfläche	AlTiN
DIN/Form	WN
Typ	NX
Innenkühlung	mit
Katalogseite	72

Katalog-Nr.	51999
Schneidstoff	VHM
Oberfläche	AlTiN
DIN/Form	WN
Typ	NX
Innenkühlung	mit
Katalogseite	73

Katalog-Nr.	51980
Schneidstoff	VHM
Oberfläche	AlTiN
DIN/Form	WN
Typ	NX-U
Innenkühlung	mit
Katalogseite	74



v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code
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100	G	100	G	100	C	100	C	100	C
100	G	105	G	105	D	105	D	100	D
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90	G	95	G	95	C	95	C	100	C
90	G	95	G	95	C	95	C	100	C
90	F	90	F	90	C	90	C	100	C
90	F	90	F	90	C	90	C	80	C
70	E	70	E	70	C	70	C	80	C
100	F	100	F	100	B	100	B	100	B
85	F	85	F	85	C	85	C	85	C
70	E	70	E	70	C	70	C	70	C
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		50	B	50	B	50	B	50	B
		70	B	70	B	70	B	80	B
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		70	B	70	B	70	B	80	B
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		35	A	35	A	35	A	40	A
		35	A	35	A	35	A	40	A
		70	M	70	M	70	M	120	M
		70	M	70	M	70	M	120	M
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		280	F						
		110	E						
		80	D						

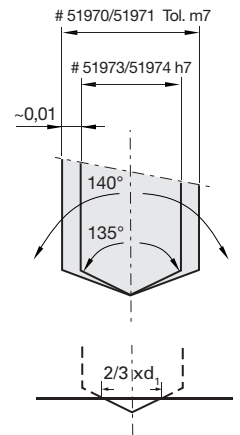
Arbeitsrichtwerte

SuperV-NX VA Hochleistungs-Kleinstbohrer

Arbeitsrichtwerte

Vorschubreihen für Hochleistungs-Kleinstbohrer

Vorschub-Code	A	B	C	D	E	F	G	H	I	J	K	L	M	
Werkzeug-Ø mm	0,50	0,006	0,012	0,018	0,022	0,030	0,035	0,040	0,045	0,050	0,050	0,055	0,060	0,060
	0,80	0,008	0,016	0,024	0,032	0,040	0,050	0,060	0,070	0,080	0,080	0,090	0,090	
	1,00	0,012	0,022	0,032	0,042	0,060	0,070	0,080	0,090	0,100	0,100	0,110	0,110	0,120
	1,50	0,021	0,036	0,051	0,066	0,090	0,100	0,120	0,130	0,150	0,150	0,160	0,170	0,180
	2,00	0,032	0,052	0,072	0,092	0,120	0,140	0,160	0,180	0,200	0,210	0,220	0,230	0,240
	2,50	0,045	0,070	0,095	0,120	0,150	0,170	0,200	0,220	0,250	0,260	0,270	0,280	0,300
	3,00	0,060	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300	0,310	0,330	0,340	0,360



Werkzeuge mit **fett gedruckten** Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Sicherheitshinweise: Enorm wichtig ist, dass aus Sicherheitsgründen kein Bohrer ohne Abstützung mit einer höheren Drehzahl als $n = 6.000$ U/min frei drehen darf. Die Zentrifugalkräfte könnten sonst die langen Werkzeuge schon vor dem Erreichen der Werkstückoberfläche brechen!

Allgemeine Hinweise: Spielarme Spindeln, fluchtgenaue Werkzeugaufnahmen. Wir empfehlen die Anwendung von Hydraulik-Dehnspannfuttern oder Schrumpffuttern sowie Kühlschmierung durch Emulsion oder Öl, Druck min. 40 bar.

Pilotbohrung

Beim Einsatz der SuperV-NX VA-Bohrer 10x/15xD empfehlen wir die Herstellung einer Pilotbohrung mit 1xD bis 2xD Tiefe. Die SuperV-NX VA Bohrer 3xD sind optimal für diese Pilotbohrung geeignet. Die Spitzenwinkel und die Durchmesser toleranzen sind darauf abgestimmt.

Zentrieren

Alternativ kann der SuperV-NX VA Bohrer 10xD auch zentriert werden, um die volle Leistung zu erreichen. Hierzu können die SuperV-NX VA Bohrer 3xD verwendet werden. Der Zentrierdurchmesser sollte ca. 2/3xD haben. Wahlweise kann die Zentrierung auch mit dem Stock NC-Anbohrer 142°, Katalog-Nr. 71189, erstellt werden.

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert ■
- Bohrölemulsion ■
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	■
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Kugelgraphit- und Temporguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Hartguss	-		≤350 HB	■
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		■
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		■
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		■
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		■
langspanend	2.0790 CuNi18Zn19Pb	>600-850		■
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■

≤3×D

≤3×D

≤6×D

≤10×D

≤15×D

Katalog-Nr.	51970
Schneidstoff	VHM
Oberfläche	TiSiN+
DIN/Form	WN
Typ	NX VA
Innenkühlung	ohne
Katalogseite	75

Katalog-Nr.	51971
Schneidstoff	VHM
Oberfläche	TiSiN+
DIN/Form	WN
Typ	NX VA
Innenkühlung	axial
Katalogseite	76

Katalog-Nr.	51972
Schneidstoff	VHM
Oberfläche	TiSiN+
DIN/Form	WN
Typ	NX VA
Innenkühlung	axial
Katalogseite	77

Katalog-Nr.	51973
Schneidstoff	VHM
Oberfläche	TiSiN+
DIN/Form	WN
Typ	NX VA
Innenkühlung	axial
Katalogseite	78

Katalog-Nr.	51974
Schneidstoff	VHM
Oberfläche	TiSiN+
DIN/Form	WN
Typ	NX VA
Innenkühlung	axial
Katalogseite	79



V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code
90	G	100	E	100	D	100	C	100	B
90	G	100	E	100	D	100	C	100	B
90	G	100	E	100	D	100	C	100	B
90	G	100	E	100	D	100	C	100	B
90	G	100	E	100	D	100	D	100	B
90	G	100	E	100	D	100	D	100	B
90	G	100	E	100	D	100	D	100	B
80	F	90	E	90	D	90	C	90	C
80	F	90	E	90	D	90	C	90	C
90	G	100	E	100	D	100	D	100	B
80	F	90	E	90	D	90	C	90	C
80	F	90	E	90	D	90	C	90	C
40	E	50	E	50	D	50	C	50	B
40	E	50	E	50	D	50	C	50	B
40	E	50	E	50	D	50	C	50	B
35	B	100	D	100	C	100	C	100	C
25	A	80	C	80	B	80	B	80	B
30	A	80	C	80	B	80	B	80	B
15	A	20	A	20	A	20	A	20	A
25	A	45	A	45	A	45	A	45	A
15	A	30	A	30	A	30	A	30	A
270	E	300	E	300	E	300	D	300	C
270	E	300	E	300	E	300	D	300	C
180	G	200	G	200	G	200	F	200	E
115	G	130	G	130	G	130	F	130	E
125	E	150	E	150	D	150	C	150	B
125	E	150	E	150	D	150	C	150	B
125	E	150	E	150	D	150	C	150	B
125	E	150	E	150	D	150	C	150	B
125	E	150	E	150	D	150	C	150	B
125	E	150	E	150	D	150	C	150	B

Arbeitsrichtwerte

Spiralbohrer

Arbeitsrichtwerte

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Vorschubreihen											
Code-Buchstabe	A	B	C	D	E	F	G	H	I		
Werkzeug-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Vorschübe f (mm/U)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert ■
- Bohrölemulsion ■
- ohne Schmiermittel □
- nur Luftkühlung □

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■ ■
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 >1000-1200		■ ■
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■ ■
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■ ■
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	■ ■
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■ ■
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Kugelgraphit- und Temperguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■ ■
Hartguss	-		≤350 HB	■
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■ ■
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Al-Gusslegierungen ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■ ■
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		!
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■ ■
Messing, kurzspanend langspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■ ■
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■ ■
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■ ■
Kunststoffe, duroplastisch thermoplastisch	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon		-	□ □
Kunststoffe, aramidfaserverstärkt glas-/kohlefaserverstärkt	Kevlar GFK/CFK		-	□ □

≤5×D

≤3×D

~3×D

~5×D

~5×D

Katalog-Nr.	51290
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	WN
Typ	N
Innenkühlung	ohne
Katalogseite	80

Katalog-Nr.	51146
Schneidstoff	VHM
HM-Anwendgsgr.	K/P
Oberfläche	TiAlN nano
DIN/Form	6537K
Typ	H
Innenkühlung	ohne
Katalogseite	81

Katalog-Nr.	61131
Schneidstoff	HSS-Co
HM-Anwendgsgr.	
Oberfläche	AlTiZrN
DIN/Form	1897
Typ	V18
Innenkühlung	ohne
Katalogseite	87

Katalog-Nr.	61232
Schneidstoff	HSS-Co
HM-Anwendgsgr.	
Oberfläche	AlTiZrN
DIN/Form	338
Typ	V18
Innenkühlung	ohne
Katalogseite	89

Katalog-Nr.	71018
Schneidstoff	M42
HM-Anwendgsgr.	
Oberfläche	Bronze-VAP
DIN/Form	338
Typ	V16
Innenkühlung	ohne
Katalogseite	91



V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code
100	E			38	F	38	F	35	F
90	E			33	E	33	E	30	E
100	F			44	F	44	F	40	F
90	D			42	E	42	E	40	E
100	E			44	E	44	E	40	E
90	E			44	E	44	E	40	E
80	E							35	D
80	E	80	F					20	D
								16	C
100	F			40	F	40	F	36	F
80	E							20	C
		65	D					15	C
65	E							16	D
		80	D					12	C
65	C							15	C
								12	C
								15	C
30	C							8	B
20	B	40	B					4	A
		30	A						
30	B			20	D	20	D	18	C
20	A			15	C	15	C	14	C
30	B			18	C	18	C	16	C
115	E	90	H	30	F	30	F	35	F
100	E	80	H	30	F	30	F	30	F
90	E	80	H					30	F
80	E	70	G					28	F
		30	B					10	C
20	C			H	A	H	A	8	A
15	A			12	B	12	B	10	B
15	A			H	B	H	B	6	B
260	H			90	G	90	G	90	G
260	H			90	G	90	G	90	G
195	G			80	G	80	G	80	G
155	G			70	F	70	F	70	F
235	F			70	F	70	F	70	F
100	F			70	E	70	E	70	E
235	F			60	E	60	E	60	E
235	F			40	E	40	E	40	E
155	F			35	D	35	D	35	D
155	F			33	D	33	D	33	D
90	E			20	D	20	D	20	D
65	D			15	D	15	D	15	D
50	E							20	D
65	D			30	D	30	D	30	E
100	D								

Tieflochbohrer

Arbeitsrichtwerte

		Vorschubreihen							
Code-Buchstabe		K	L	M	N	O	P	Q	R
Werkzeug-Ø mm	1,50	0,002	0,004	0,006	0,008	0,012	0,020	0,032	0,045
	2,00	0,003	0,005	0,007	0,010	0,016	0,028	0,046	0,055
	2,50	0,004	0,006	0,008	0,012	0,018	0,030	0,054	0,070
	4,00	0,005	0,007	0,010	0,016	0,025	0,043	0,065	0,085
	6,00	0,007	0,009	0,013	0,024	0,035	0,061	0,085	0,120
	8,00	0,010	0,014	0,022	0,032	0,045	0,068	0,100	0,150
	10,00	0,012	0,016	0,028	0,040	0,055	0,075	0,120	0,160
	14,00	0,020	0,025	0,035	0,050	0,065	0,085	0,130	0,180
	18,00	0,025	0,030	0,040	0,055	0,070	0,095	0,145	0,200
	20,00	0,026	0,035	0,045	0,060	0,080	0,110	0,180	0,250
	24,00	0,027	0,036	0,047	0,065	0,085	0,130	0,185	0,300
	28,00	0,028	0,038	0,049	0,068	0,090	0,140	0,195	0,350
	30,00	0,030	0,040	0,050	0,070	0,100	0,150	0,200	0,400
	35,00	0,035	0,045	0,055	0,075	0,120	0,180	0,250	0,450
	40,00	0,040	0,050	0,060	0,080	0,150	0,200	0,300	0,500

Vorschube
f (mm/U)

Kühlmitteleinsatz:

Schneidöl, hochaktiviert, grenzflächenaktives Schmiermittel mit wirksamen Stoffen (Additiven), die chemisch reagieren und dabei einen besonders haftenden und verschleißmindernden Schmierfilm erzeugen.

Bohrölemulsion

ohne Schmiermittel

nur Luftkühlung

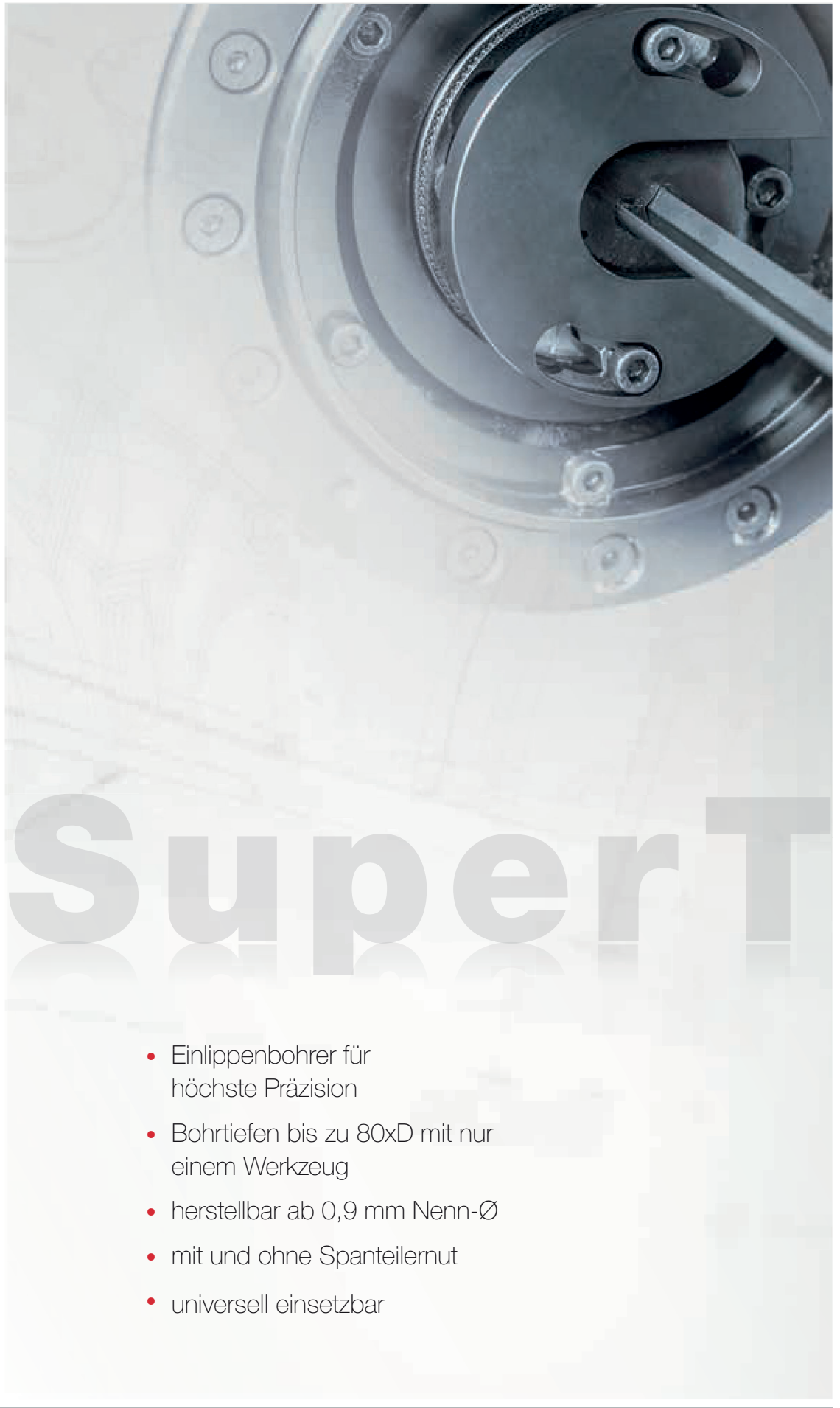


Sämtliche Tieflochbohrer müssen beim Anbohren geführt werden. Tieflochbohrer dürfen nie mit voller Drehzahl frei im Maschinenraum bewegt werden. Bitte beachten Sie die Anwendungsrichtlinien!

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Tempereguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input checked="" type="checkbox"/>
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch	Epoxidharz, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
thermoplastisch	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt	Kevlar		-	<input type="checkbox"/>
glas-/kohlefaserverstärkt	GFK/CFK		-	<input type="checkbox"/>

Arbeitsrichtwerte

Katalog-Nr.	65030 65031 65032 65033
Schneidstoff	HM
Oberfläche	TiN
Typ	SuperT-NXL
Katalogseite	82/83/84/85

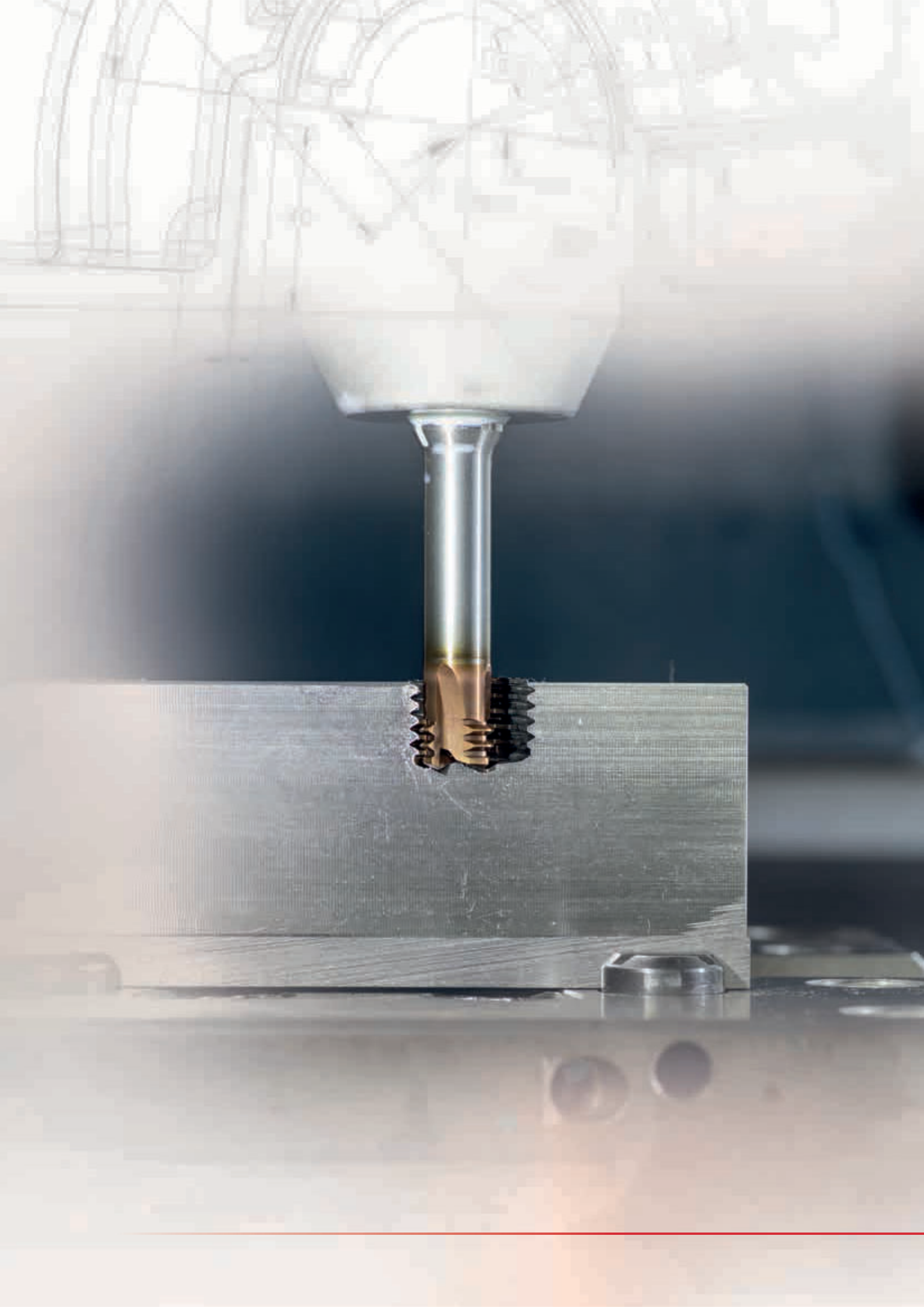


V _c m/min	VR-Code
100	N
85	N
90	N
80	N
90	M
80	M
75	M
75	M
65	M
80	N
75	M
65	M
75	M
65	M
75	L
65	L
55	K
65	L
30	L
25	K
55	M
45	M
35	M
85	O
80	O
80	N
70	N
55	M
35	K
35	K
30	K
150	P
120	O
150	P
130	P
110	P
75	N
120	Q
90	Q
95	P
75	P
70	P
60	P
75	N
70	N
60	M
50	M

SuperT

- Einlippenbohrer für höchste Präzision
- Bohrtiefen bis zu 80xD mit nur einem Werkzeug
- herstellbar ab 0,9 mm Nenn-Ø
- mit und ohne Spanteilemut
- universell einsetzbar

Arbeitsrichtwerte





Auswahlempfehlungen für Gewindebohrer



Bohrungsart				
Schneidstoff	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM
Schneidrichtung	rechts	links	rechts	rechts
Typ	ProduktivN-X	ProduktivN-X	ProduktivN-X	ProduktivN-X
Form	B	B	B	B
Kühlung	außen	außen	außen	radial
Oberfläche	AlTiZrN	AlTiZrN	AlTiZrN	AlTiZrN

Gewindeart	Baumaße nach DIN 2184-1	Toleranzfeld	Katalog-Nr./Ø-Bereich/Seite			
M	DIN 371/DIN 376	6HX	53733 M2 - M42 Seite 68	53734 M2 - M30 Seite 69	53735 M3 - M20 Seite 70	53736 M5 - M30 Seite 71
		6H+0,1	53737 M2 - M30 Seite 72			
		6GX	53738 M2 - M30 Seite 73			
	WN überlang	6HX	53739 M3 - M20 Seite 74			
MF	DIN 374	6HX	53778 M3x0,35 - M24x2 Seite 93		53789 M8x1 - M24x1.5 Seite 94	53790 M8x1 - M24x1.5 Seite 95
		6GX	53779 M6x0,75 - M24x1.5 Seite 96			
UNC	DIN 2184-1	2BX	53782 No.2-56 - 1-8 Seite 103			
UNF	DIN 2184-1	2BX	53784 No.2-64 - 1-12 Seite 105			

Arbeitsrichtwerte



ECONOMY CLASS
die günstigste Innengewindeherstellung



BUSINESS CLASS
die wirtschaftliche Innengewindeherstellung



PREMIUM CLASS
die optimale Innengewindeherstellung

Auswahlempfehlungen für Gewindebohrer

Materialgruppe		Zugfestigkeit	Materialbeispiel	Werkstoff-Nr.	Empfohlene Schnittgeschwindigkeit v_c m/min			
P	Bau-/Automatenstähle, unleg. Vergütungs-/Einsatzstähle	≤ 800 N/mm ²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	20	20	25	25
	Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800 - 1000 N/mm ²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	15	15	20	20
	Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800 - 1200 N/mm ²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	10	10	15	15
M	Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	≤ 1000 N/mm ²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	12	12	15	15
	Rost- und säurebeständige Stähle, martensitisch	≤ 1000 N/mm ²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	10	10	12	12
	Duplex und Super Duplex	≤ 1300 N/mm ²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6	6	8	8
	Gusseisen	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	20	20	25	25
K	Kugelgraphit- und Temperguss	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	20	20	25	25
	ADI GGV	1000 N/mm ² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400	 	10	10	15	15
N	Aluminium, Aluminium-Knetlegierungen	≤ 450 N/mm ²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 3.2315 3.4335	10	10	12	12
	Aluminium-Gusslegierungen	≤ 600 N/mm ²	GD-ALSi5Cu1Mg GD-ALSi8Cu3 G-ALSi9Mg G-ALSi12	3.2134 3.2162 3.2373 3.2581	20	20	25	25
	Magnesium-Legierungen	≤ 500 N/mm ²	GDMgAl8Zn1	3.5812.08				
	Kupfer und Kupferlegierungen	langspanend	CuZn20 CuZn37Pb0,5	2.0250 2.0332	20	20	25	25
		kurzspanend	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	20	20	25	25
	Kupfer-Sonderleg.	≤ 1400 N/mm ²	Ampco		10	10	15	15
	Kunststoffe [Thermo-, Duroplaste]	langspanend kurzspanend	PMMA, POM, PVC Pertinax					
S	Titan und Titanlegierungen	≤ 1200 N/mm ²	Titan TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	3	3	5	5
	Nickel-, Kobalt-, und Eisen-Legierungen	≤ 1400 N/mm ²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	2	2	3	3
H	hochfeste Stähle, gehärtete Stähle	45 - 55 HRC						
		55 - 62 HRC						

Auswahlempfehlungen für Gewindebohrer



Bohrungsart					
Schneidstoff	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E
Schneidrichtung	rechts	links	rechts	rechts	rechts
Typ	IntensivN-X	IntensivN-X	IntensivN-X	IntensivN-X	IntensivN-X
Form	C	C	C	C	E
Kühlung	außen	außen	außen	axial	außen
Oberfläche	TiAIN-H	TiAIN-H	TiAIN-H	TiAIN-H	TiAIN-H

Gewindeart	Baumaße nach DIN 2184-1	Toleranzfeld	Katalog-Nr./Ø-Bereich/Seite				
			53746 M2 - M42 Seite 75	53747 M2 - M30 Seite 76	53748 M3 - M20 Seite 77	53749 M5 - M30 Seite 78	53760 M2 - M30 Seite 79
M	DIN 371/DIN 376	6HX	53750 M2 - M30 Seite 80				
		6H+0,1	53751 M2 - M30 Seite 81				
		6GX	53752 M3 - M20 Seite 82				
	WN überlang	6HX	53780 M3x0,35 - M24x2 Seite 97		53791 M8x1 - M24x1.5 Seite 98	53792 M8x1 - M24x1.5 Seite 99	53770 M6x0.75 - M24x1.5 Seite 100
MF	DIN 374	6HX	53781 M6x0.75 - M24x1.5 Seite 101				
		6GX	53783 No.2-56 - 1-8 Seite 104				
UNC	DIN 2184-1	2BX	53785 No.2-64 - 1-12 Seite 106				
UNF	DIN 2184-1	2BX					
G	DIN 5156	DIN ISO 228					53775 G1/16 - G1 Seite 107

Auswahlempfehlungen für Gewindebohrer

Materialgruppe		Zugfestigkeit	Materialbeispiel	Werkstoff-Nr.	Empfohlene Schnittgeschwindigkeit v _c m/min				
P	Bau-/Automatenstähle, unleg. Vergütungs-/Einsatzstähle	≤800 N/mm ²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	20	20	25	25	20
	Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800 - 1000 N/mm ²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	15	15	20	20	15
	Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800 - 1200 N/mm ²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	10	10	12	12	10
M	Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	≤1000 N/mm ²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	12	12	15	15	12
	Rost- und säurebeständige Stähle, martensitisch	≤1000 N/mm ²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	10	10	12	12	10
	Duplex und Super Duplex	≤1300 N/mm ²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6	6	8	8	6
K	Gusseisen	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	20	20	25	25	20
	Kugelgraphit- und Temperguss	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	20	20	25	25	20
	ADI GGV	1000 N/mm ² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		10	10	15	15	10
N	Aluminium, Aluminium-Knetlegierungen	≤450 N/mm ²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 3.2315 3.4335	10	10	12	12	10
	Aluminium-Gusslegierungen	≤600 N/mm ²	GD-ALSi5Cu1Mg GD-ALSi8Cu3 G-ALSi9Mg G-ALSi12	3.2134 3.2162 3.2373 3.2581	20	20	25	25	20
	Magnesium-Legierungen	≤500 N/mm ²	GDMgAl8Zn1	3.5812.08					
	Kupfer und Kupferlegierungen	langspanend	CuZn20	2.0250	20	20	25	25	20
			CuZn37Pb0,5	2.0332					
	Kupfer-Sonderleg.	kurzspanend	CuZn39Pb2	2.0380	20	20	25	25	20
			CuZn43Pb2	2.0410					
Kunststoffe [Thermo-, Duroplaste]	langspanend kurzspanend	PMMA, POM, PVC Pertinax							
S	Titan und Titanlegierungen	≤ 1200 N/mm ²	Titan TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	3	3	5	5	3
	Nickel-, Kobalt-, und Eisen-Legierungen	≤ 1400 N/mm ²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	2	2	3	3	2
H	hochfeste Stähle, gehärtete Stähle	45 - 55 HRC							
		55 - 62 HRC							

Auswahlempfehlungen für Gewindebohrer



Bohrungsart					
Schneidstoff	HSS-E	HSS-E-PM	HSS-E	HSS-E	HSS-E-PM
Typ	Produktiv H	Produktiv H	Intensiv H	Intensiv H	Intensiv H
Form	B	B	C	C	C
Oberfläche	TiCN	TiCN	nitriert	TiCN	TiAlN

Gewindeart	Baumaße nach DIN 2184-1	Toleranzfeld	Katalog-Nr./Ø-Bereich/Seite				
			53642 M2 - M10 Seite 86	53640 M3 - M10 Seite 87	73661 M3 - M10 Seite 88	53661 M2 - M10 Seite 90	53664 M3 - M10 Seite 91
M	DIN 371	ISO 2 6H					
	DIN 376	ISO 2 6H	53642 M12 - M20 Seite 86	53640 M12 - M16 Seite 87	73664 M12 - M20 Seite 89	53661 M12 - M20 Seite 90	53664 M12 - M20 Seite 91
MF	DIN 374	ISO 2 6H			73647 M8x0.75 - M24x1.5 Seite 102		

	Materialgruppe	Zugfestigkeit	Materialbeispiel	Werkstoff-Nr.	Empfohlene Schnittgeschwindigkeit v _c m/min				
					6	10	12	15	6
P	Bau-/Automatenstähle, unlegierte Vergütungs-/Einsatzstähle	≤800 N/mm ²	S235JR	1.0037					
			C15	1.0401					
			11SMnPb30	1.0718					
P	Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800 - 1000 N/mm ²	S355J2	1.0577					
			C60	1.0601	6	10			
			31CrMo12	1.8515					
P	Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800 - 1200 N/mm ²	42CrMo4	1.7225					
			36CrNiMo4	1.6511	12	15	10	12	6
			X36CrMo17	1.2316					
			HS 6-5-2	1.3343					

Auswahlempfehlungen für Gewindebohrer



Bohrungsart			max. 1,5 x D
Schneidstoff	HSS-E	HSS-E	HSS-E-PM
Typ	Produktiv N	H	H
Form	B	C	D
Oberfläche	TiN	TiCN	TiCN

Gewindeart	Baumaße nach DIN 2184-1	Toleranzfeld	Katalog-Nr./Ø-Bereich/Seite		
M	DIN 371	ISO 2 6H	63033 M3 - M10 Seite 83		
		6HX			53676 M3 - M16 Seite 92
	DIN 376	ISO 2 6H	63033 M12 - M20 Seite 83		
		6HX		53646 M16 - M39 Seite 84	
	~ DIN 376	6HX		53647 (WN, Überlänge) M16 - M39 Seite 85	

	Materialgruppe	Zugfestigkeit	Materialbeispiel	Werkstoff-Nr.	Empfohlene Schnittgeschwindigkeit v _c m/min		
P	Bau-/Automatenstähle, unlegierte Vergütungs-/Einsatzstähle	≤800 N/mm ²	S235JR	1.0037	15		
			C15	1.0401			
			11SMnPb30	1.0718			
	Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800 - 1000 N/mm ²	S355J2	1.0577	12	15	
			C60	1.0601			
			31CrMo12	1.8515			
Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800 - 1200 N/mm ²	42CrMo4	1.7225	8	12		
		36CrNiMo4	1.6511				
		X36CrMo17	1.2316				
		HS 6-5-2	1.3343				
K	Gusseisen	300 HB	EN-GJL-150	0.6015	25		
			EN-GJL-250	0.6025			
			EN-GJL-300	0.6030			
	Kugelgraphit- und Temperguss	350 HB	EN-GJS-400-15	0.7040	20		
			EN-GJS-600-3	0.7060			
			EN-GJS-700-2	0.7070			
ADI GGV	1000 N/mm ²	EN-GJS1000-5		15			
	350 HB	EN-GJV250 EN-GJV400					
H	Hochfeste Stähle, gehärtete Stähle	45-55 HRC	Hardox 500				3
		55-62 HRC					

Arbeitsrichtwerte

Auswahlempfehlungen für Gewindeformer



Bohrungsart			
Schneidstoff	HSS-E-PM	HSS-E-PM	HSS-E-PM
Typ	Durativ N-X	Durativ N-X	Durativ N-X
Form	C mit Schmiernuten	C mit Schmiernuten	E
Oberfläche	TiCN	TiCN	TiCN
Kühlung	außen	radial	axial*

Gewindeart	Baumaße nach DIN 2184-1	Toleranzfeld	Katalog-Nr./Ø-Bereich/Seite		
M	~ DIN 371	4/6HX	53630 M1-M20 Seite 108	53610 M5-M20 Seite 114	53618 M2*-M10 Seite 115
		6GX	53631 M2-M10 Seite 109		
	~ DIN 376	6HX	53630 M12-M20 Seite 108		53618 M12-M20 Seite 115
		6GX	53631 M12-M20 Seite 109		
MF	~ DIN 374	6HX	53632 M3x0,35-M24x2 Seite 110	53612 M8x1-M20x1.5 Seite 116	53619 M8x1-M20x1.5 Seite 117
UNC	~ DIN 371 ~ DIN 376	2BX	53633 No.4-40 - 3/4-10 Seite 111		
UNF	~ DIN 374	2BX	53634 No.4-48 - 3/4-16 Seite 112		
G	DIN 2189	X	53635 G1/8 - G1/2 Seite 113		

Alle Werkzeuge ab M2 mit Schmiernuten.
* ab M5 mit IKZ

Auswahlempfehlungen für Gewindeformer

Materialgruppe		Zugfestigkeit	Materialbeispiel	Werkstoff-Nr.	Empfohlene Schnittgeschwindigkeit v _c m/min									
P	P1	Bau-/Automatenstähle, unlegierte Vergütungs-/Einsatzstähle	≤800 N/mm ²	S235JR	1.0037	25	25	25						
				C15	1.0401									
				11SMnPb30	1.0718									
P	P2	Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800 - 1000 N/mm ²	S355J2	1.0577	25	25	25						
				C60	1.0601									
				31CrMo12	1.8515									
P	P3	Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800 - 1200 N/mm ²	42CrMo4	1.7225	15	15	15						
				36CrNiMo4	1.6511									
				X36CrMo17	1.2316									
M	M1	Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	≤1000 N/mm ²	X5CrNi18-10	1.4301	15	15	15						
				X6CrNiTi18-10	1.4571									
				X8CrNiS18-9	1.4305									
M	M2	Rost- und säurebeständige Stähle, martensitisch	≤1000 N/mm ²	X17CrNi16-2	1.4057	10	10	10						
				X90CrMoV18	1.4112									
				X2CrTi12	1.4512									
M	M3	Duplex und Super Duplex	≤1300 N/mm ²	X2CrNiMoN22-5-3	1.4462	6	6	6						
				X2CrNiMoN25-7-4	1.4410									
				X2CrNiMoCuWN25-7-4	1.4501									
K	K1	Gusseisen	300 HB	EN-GJL-150	0.6015									
				EN-GJL-250	0.6025									
				EN-GJL-300	0.6030									
K	K2	Kugelgraphit- und Temperguss	350 HB	EN-GJS-400-15	0.7040	30	30	30						
				EN-GJS-600-3	0.7060									
				EN-GJS-700-2	0.7070									
K	K3	ADI GGV	1000 N/mm ² 350 HB	EN-GJS1000-5		25	25	25						
				EN-GJV250 EN-GJV400										
N	N1	Aluminum, Aluminium-Knetlegierungen	≤450 N/mm ²	Al99,5H	3.0250	15	15	15						
				AlMgSi1	3.2315									
				AlZn4,5Mg	3.4335									
N	N2	Aluminium-Gusslegierungen	≤600 N/mm ²	GD-AlSi5Cu1Mg	3.2134	30	30	30						
				GD-AlSi8Cu3	3.2162									
				G-AlSi9Mg	3.2373									
N	N3	Magnesium-Legierungen	≤500 N/mm ²	GDMgAl8Zn1	3.5812.08									
				N4	Kupfer und Kupferlegierungen				langspanend	CuZn20	2.0250	30	30	30
										CuZn37Pb0,5	2.0332			
N	N5	Kupfer-Sonderlegierungen	≤1400 N/mm ²	CuZn39Pb2	2.0380									
				CuZn43Pb2	2.0410									
				N6	Kunststoffe [Thermoplaste, Duroplaste]				langspanend kurzspanend	PMMA, POM, PVC Pertinax				
S	S1	Titan und Titan-Legierungen	≤1200 N/mm ²	Titan	3.7025	8	8	8						
				TiAl5Sn2	3.7115									
				TiAl6V4	3.7165									
S	S2	Nickel-, Kobalt-, und Eisen-Legierungen	≤1400 N/mm ²	Hastelloy C4	2.4610	8	8	8						
				Inconel 718	2.4668									
				Nimonic 105	2.4634									
H	H1	Hochfeste Stähle, gehärtete Stähle	45 - 55 HRC											
				55 - 62 HRC										

Arbeitsrichtwerte

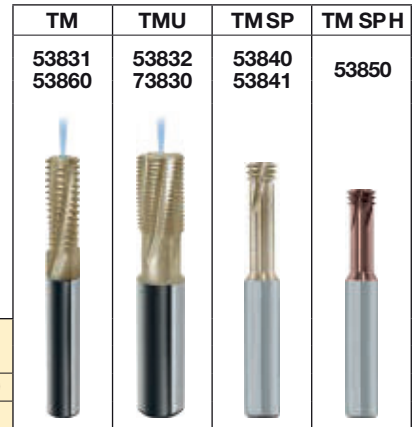
Gewindefräser und Mikro-Gewindefräser

ISO	Werkstoffgruppe	Härte	Materialbeispiel	Werkstoff-Nr.	Schnittgeschw. v_c (m/min)	
P	P1 Bau/Automatenstähle, unlegierte Vergütungs-/ Einsatzstähle	< 800 N/mm ²	S235JR	1.0037	90	
			C15	1.0401		
			11SMnPb30	1.0718		
	P2 Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800-1000 N/mm ²	S355J2	1.0577	80	
			C60	1.0601		
			31CrMo12	1.8515		
P3 Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800-1200 N/mm ²	42CrMo4	1.7225	70		
		36CrNiMo4	1.6511			
		X36CrMo17	1.2316			
M	M1 Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	< 1000 N/mm ²	X5CrNi18-10	1.4301	55	
			X6CrNiTi18-10	1.4571		
			X8CrNiS18-9	1.4305		
	M2 Rost und säurebeständige Stähle, martensitisch	< 1000 N/mm ²	X17CrNi16-2	1.4057	50	
			X90CrMoV18	1.4112		
			X2CrTi12	1.4512		
M3 Duplex und Super Duplex	< 1300 N/mm ²	X2CrNiMoN22-5-3	1.4462	45		
		X2CrNiMoN25-7-4	1.441			
		X2CrNiMoCuWn25-7-4	1.4501			
K	K1 Gusseisen	300 HB	EN-GJL-150	0.6015	120	
			EN-GJL-250	0.6025		
			EN-GJL-300	0.603		
	K2 Kugelgraphit- und Temperguss	350 HB	EN-GJS-400-15	0.704	100	
			EN-GJS-600-3	0.706		
			EN-GJS-700-2	0.707		
K3 ADI, GGV	1000 N/mm ² 350 HB	EN-GJS1000-5		80		
		EN-GJV250				
		EN-GJV400				
N	N1 Aluminium, Aluminium-Knetlegierung	< 450 N/mm ²	Al99,5H	3.025	250	
			AlMgSi1	3.2315		
			AlZn4,5Mg	3.4335		
	N2 Aluminium- Gusslegierungen	< 600 N/mm ²	GD-AlSi5Cu1Mg	3.2134	230	
			GD-AlSi8Cu3	3.2162		
			G-AlSi9Mg	3.2373		
	N3 Magnesium-Legierungen	< 500 N/mm ²	G-AlSi12	3.2581	180	
			GDMgAl8Zn1	3.5812.08		
			CuZn20	2.025		
	N4 Kuper und Kupferlegierungen	langspanend		CuZn37Pb0,5	2.0332	130
		kurzspanend		CuZn39Pb2	2.038	
				CuZn43Pb2	2.041	
N5 Kupfer-Sonderlegierungen	< 1400 N/mm ²		Ampco		160	
N6 Kunststoffe [Thermoplaste, Duroplaste]	langspanend		PMMA, POM,PVC		300	
	kurzspanend		Pertinax			
S	S1 Titan und Titanlegierungen	< 1200 N/mm ²	Titan	3.7025	40	
			TiAl5Sn2	3.7115		
			TiAl6V4	3.7165		
	S2 Nickel-, Kobalt- und Eisen-Legierungen	< 1400 N/mm ²	Hastelloy C4	2.461	30	
Inconel 718			2.4668			
H	H1 H2 Hochfeste Stähle, gehärtete Stähle	45-55 HRC	Hardox		45	
		55-62 HRC	PM30		40	

Bitte beachten:

Die in den jeweiligen Spalten angegebenen Schnittwerte sind Richtwerte, diese müssen je nach Einsatzbedingungen (Material, Schmierung, Werkzeugspannung, Maschine, usw.) angepasst werden.

Je nach Einsatzfall können die optimalen Schnittwerte um bis zu ±30% der Tabelle abweichen!



Frästeildurchmesser [d ₁] / Vorschub pro Zahn [f _z] [Gegenlauf]																		
Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø16	Ø18	Ø20				
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				
0,01	0,02	0,02	0,025	0,03	0,035	0,045	0,05	0,055	0,06	0,06	0,065	0,065	0,07	0,08	●	●	●	
0,01	0,02	0,02	0,025	0,03	0,035	0,045	0,05	0,055	0,06	0,06	0,065	0,065	0,07	0,08	●	●	●	
0,01	0,02	0,02	0,025	0,03	0,035	0,045	0,05	0,055	0,06	0,06	0,065	0,065	0,07	0,08	○	●	●	○
0,01	0,02	0,025	0,03	0,03	0,03	0,035	0,04	0,05	0,055	0,06	0,065	0,065	0,07	0,075	○	●	●	
0,01	0,02	0,025	0,03	0,03	0,03	0,035	0,04	0,05	0,055	0,06	0,065	0,065	0,07	0,075	○	●	●	
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,06	0,065	0,07	0,08	0,09	0,1	0,12	●	●	●	
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,06	0,065	0,07	0,08	0,09	0,1	0,12	●	●	●	
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,06	0,065	0,07	0,08	0,09	0,1	0,12	●	●	●	○
0,02	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,08	0,085	0,09	0,1	0,12	●	●	●	
0,02	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,08	0,085	0,09	0,1	0,12	●	●	●	
0,02	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,08	0,085	0,09	0,1	0,12	●	●	●	
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	0,08	0,09	●	●	●	
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,06	0,065	0,07	0,075	0,08	●	●	●	
0,02	0,03	0,04	0,045	0,05	0,055	0,06	0,07	0,08	0,09	0,09	0,1	0,12	0,13	0,15	●	●	●	
0,01	0,01	0,015	0,02	0,025	0,03	0,035	0,04	0,04	0,045	0,05	0,055	0,06	0,065	0,07	●	●	●	
0,01	0,01	0,015	0,02	0,025	0,03	0,035	0,04	0,04	0,045	0,05	0,055	0,06	0,065	0,07	●	●	●	●
x	0,01	0,015	0,02	0,025	0,03	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	○	○	●	●
x	0,01	0,015	0,02	0,025	0,03	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	○	○	●	●

Allgemeine Empfehlung:

- 1.) Ab 2,5xD Gewindetiefe sollte im Gewinde Ø in 2 Durchgängen programmiert werden. [2/3-1/3 im Gegenlauf]
- 2.) Allgemein im VA und in der Hartbearbeitung ab >HRC40 ist zu empfehlen das wir im Gewinde Ø in 2 Durchgängen programmieren. [2/3-1/3 im Gegenlauf]

- optimal geeignet
- gut geeignet
- nicht geeignet

Arbeitsrichtwerte

MTM-NX 2,5xD (Bitte beachten, Linkslauf M4)

ISO	Werkstoffgruppe	Härte	Materialbeispiel	Werkstoff-Nr.	Schnittgeschw. v_c (m/min)
P	P1 Bau-/Automatenstähle, unlegierte Vergütungs-/ Einsatzstähle	< 800 N/mm ²	S235JR	1.0037	100
			C15	1.0401	
			11SMnPb30	1.0718	
	P2 Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800-1000 N/mm ²	S355J2	1.0577	90
			C60	1.0601	
	P3 Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800-1200 N/mm ²	31CrMo12	1.8515	80
42CrMo4			1.7225		
36CrNiMo4			1.6511		
X36CrMo17			1.2316		
M	M1 Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	< 1000 N/mm ²	HS 6-5-2	1.3343	65
			X5CrNi18-10	1.4301	
			X6CrNiTi18-10	1.4571	
	M2 Rost- und säurebeständige Stähle, martensitisch	< 1000 N/mm ²	X8CrNiS18-9	1.4305	60
			X17CrNi16-2	1.4057	
	M3 Duplex und Super Duplex	< 1300 N/mm ²	X90CrMoV18	1.4112	55
X2CrTi12			1.4512		
K	K1 Gusseisen	300 HB	X2CrNiMoN22-5-3	1.4462	140
			X2CrNiMoN25-7-4	1.441	
			X2CrNiMoCuWn25-7-4	1.4501	
	K2 Kugelgraphit- und Temperguss	350 HB	EN-GJL-150	0.6015	120
			EN-GJL-250	0.6025	
			EN-GJL-300	0.603	
	K3 ADI, GGV	1000 N/mm ² 350 HB	EN-GJS-400-15	0.704	100
			EN-GJS-600-3	0.706	
			EN-GJS-700-2	0.707	
N	N1 Aluminium, Aluminium-Knetlegierung	< 450 N/mm ²	EN-GJS1000-5	0.704	100
			EN-GJV250	0.706	
			EN-GJV400	0.707	
	N2 Aluminium-Gusslegierungen	< 600 N/mm ²	Al99,5H	3.025	280
			AlMgSi1	3.2315	
			AlZn4,5Mg	3.4335	
	N3 Magnesium-Legierungen	< 500 N/mm ²	GD-AlSi5Cu1Mg	3.2134	250
			GD-AlSi8Cu3	3.2162	
			G-AlSi9Mg	3.2373	
N4 Kupfer und Kupferlegierungen	langspanend	G-AlSi12	3.2581	200	
		GDMgAl8Zn1	3.5812.08		
N5 Kupfer-Sonderlegierungen	kurzspanend	CuZn20	2.025	140	
		CuZn37Pb0,5	2.0332		
		CuZn39Pb2	2.038		
N6 Kunststoffe [Thermoplaste, Duroplaste]	langspanend kurzspanend	CuZn43Pb2	2.041	130	
		Ampeco			
S	S1 Titan und Titan-Legierungen	< 1200 N/mm ²	PMMA, POM, PVC		300
			Pertinax		
	S2 Nickel-, Kobalt- und Eisen-Legierungen	< 1400 N/mm ²	Titan	3.7025	55
			TiAl5Sn2	3.7115	
			TiAl6V4	3.7165	
H1 H2 Hochfeste Stähle, gehärtete Stähle	45-55 HRC 55-66 HRC	Hastelloy C4	2.461	40	
		Inconel 718	2.4668		
			Nimonic	2.4634	

Bitte beachten:

Die in den jeweiligen Spalten angegebenen Schnittwerte sind Richtwerte, diese müssen je nach Einsatzbedingungen (Material, Schmierung, Werkzeugspannung, Maschine, usw.) angepasst werden.

Je nach Einsatzfall können die optimalen Schnittwerte um bis zu ±30% der Tabelle abweichen!



Frästeildurchmesser [d1] / Vorschub pro Zahn [f _z] [Gleichlauf]													
Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø16	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,008	0,015	0,02	0,025	0,03	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,055	●
0,008	0,015	0,02	0,025	0,03	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,055	●
0,008	0,015	0,02	0,025	0,03	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,055	●
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,01	0,02	0,02	0,025	0,03	0,03	0,035	0,035	0,04	0,045	0,05	0,055	0,06	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,01	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,075	●
0,005	0,007	0,012	0,015	0,02	0,025	0,03	0,035	0,035	0,04	0,045	0,045	0,05	●
0,005	0,007	0,012	0,015	0,02	0,025	0,03	0,035	0,035	0,04	0,045	0,045	0,05	●
0,005 x	0,008 x	0,01 x	0,012 x	0,015 x	0,02 x	0,025 x	0,025 x	0,03 x	0,03 x	0,035 x	0,04 x	0,045 x	●

- optimal geeignet
- gut geeignet
- nicht geeignet

Arbeitsrichtwerte

TMC-NX 2xD IK

ISO	Werkstoffgruppe	Härte	Materialbeispiel	Werkstoff-Nr.	Schnittgeschw. v_c (m/min)
P	P1 Bau-/Automatenstähle, unlegierte Vergütungs-/ Einsatzstähle	< 800 N/mm ²	S235JR	1.0037	100
			C15	1.0401	
			11SMnPb30	1.0718	
	P2 Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	800-1000 N/mm ²	S355J2	1.0577	90
			C60	1.0601	
	P3 Legierte Vergütungsstähle, Werkzeugstähle, Schnellarbeitsstähle	800-1200 N/mm ²	31CrMo12	1.8515	80
42CrMo4			1.7225		
36CrNiMo4			1.6511		
X36CrMo17			1.2316		
M	M1 Nichtrostende Stahlwerkstoffe, geschwefelt, austenitisch	< 1000 N/mm ²	HS 6-5-2	1.3343	60
			X5CrNi18-10	1.4301	
			X6CrNiTi18-10	1.4571	
	M2 Rost- und säurebeständige Stähle, martensitisch	< 1000 N/mm ²	X8CrNiS18-9	1.4305	55
			X17CrNi16-2	1.4057	
	M3 Duplex und Super Duplex	< 1300 N/mm ²	X90CrMoV18	1.4112	50
X2CrTi12			1.4512		
K	K1 Gusseisen	300 HB	X2CrNiMoN22-5-3	1.4462	120
			X2CrNiMoN25-7-4	1.441	
			X2CrNiMoCuWn25-7-4	1.4501	
	K2 Kugelgraphit- und Temperguss	350 HB	EN-GJL-150	0.6015	100
			EN-GJL-250	0.6025	
			EN-GJL-300	0.603	
	K3 ADI, GGK	1000 N/mm ² 350 HB	EN-GJS-400-15	0.704	90
			EN-GJS-600-3	0.706	
			EN-GJS-700-2	0.707	
N	N1 Aluminium, Aluminium-Knetlegierung	< 450 N/mm ²	EN-GJS1000-5	0.704	90
			EN-GJV250	0.706	
			EN-GJV400	0.707	
	N2 Aluminium-Gusslegierungen	< 600 N/mm ²	Al99,5H	3.025	x
			AlMgSi1	3.2315	
			AlZn4,5Mg	3.4335	
	N3 Magnesium-Legierungen	< 500 N/mm ²	GD-AlSi5Cu1Mg	3.2134	x
			GD-AlSi8Cu3	3.2162	
			G-AlSi9Mg	3.2373	
	N4 Kupfer und Kupferlegierungen	langspanend	G-AlSi12	3.2581	90
		kurzspanend	GDMgAl8Zn1	3.5812.08	
	N5 Kupfer-Sonderlegierungen	< 1400 N/mm ²	CuZn20	2.025	70
CuZn37Pb0,5			2.0332		
CuZn39Pb2			2.038		
N6 Kunststoffe [Thermoplaste, Duroplaste]	langspanend	CuZn43Pb2	2.041	x	
	kurzspanend	PMMA, POM, PVC			
S	S1 Titan und Titan-Legierungen	< 1200 N/mm ²	Ampco		55
			Titan	3.7025	
	S2 Nickel-, Kobalt- und Eisen-Legierungen	< 1400 N/mm ²	TiAl5Sn2	3.7115	45
			TiAl6V4	3.7165	
H	H1 H2 Hochfeste Stähle, gehärtete Stähle	45-55 HRC	Hastelloy C4	2.461	x
		55-66 HRC	Inconel 718	2.4668	
			Nimonic	2.4634	
			Hardox		x
			PM30		x

Bitte beachten:

Die in den jeweiligen Spalten angegebenen Schnittwerte sind Richtwerte, diese müssen je nach Einsatzbedingungen (Material, Schmierung, Werkzeugspannung, Maschine, usw.) angepasst werden.

Je nach Einsatzfall können die optimalen Schnittwerte um bis zu ±30% der Tabelle abweichen!



Frästeildurchmesser [d1] / Vorschub pro Zahn [f _z] [Gegenlauf]											
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0,01	0,015	0,02	0,02	0,025	0,025	0,025	0,03	0,03	0,035	0,04	●
0,01	0,015	0,02	0,02	0,025	0,025	0,025	0,03	0,03	0,035	0,04	●
0,01	0,015	0,02	0,02	0,025	0,025	0,025	0,03	0,03	0,035	0,04	●
0,005	0,01	0,015	0,015	0,02	0,02	0,02	0,025	0,025	0,03	0,03	●
0,005	0,01	0,015	0,015	0,02	0,02	0,02	0,025	0,025	0,03	0,03	●
0,005	0,01	0,015	0,015	0,02	0,02	0,02	0,025	0,025	0,03	0,03	●
0,01	0,02	0,025	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,06	●
0,01	0,02	0,025	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,06	●
0,01	0,02	0,025	0,03	0,03	0,035	0,04	0,04	0,045	0,05	0,06	●
x	x	x	x	x	x	x	x	x	x	x	
x	x	x	x	x	x	x	x	x	x	x	
x	x	x	x	x	x	x	x	x	x	x	
0,01	0,015	0,02	0,02	0,025	0,025	0,025	0,03	0,03	0,035	0,04	●
0,005	0,01	0,015	0,015	0,02	0,02	0,02	0,025	0,025	0,03	0,035	●
x	x	x	x	x	x	x	x	x	x	x	
0,01	0,015	0,015	0,02	0,025	0,025	0,025	0,03	0,03	0,035	0,035	●
0,005	0,01	0,01	0,015	0,02	0,02	0,02	0,025	0,025	0,03	0,03	○
x	x	x	x	x	x	x	x	x	x	x	
x	x	x	x	x	x	x	x	x	x	x	

- optimal geeignet
- gut geeignet
- nicht geeignet

Arbeitsrichtwerte

TMD-NX 2,5xD (Bitte beachten, Linkslauf M4)

ISO	Werkstoffgruppe	Härte	Materialbeispiel	Werkstoff-Nr.	Schnittgeschw. V_c (m/min)
P	P1	< 800 N/mm ²	S235JR	1.0037	80
			C15	1.0401	
			11SMnPb30	1.0718	
	P2	800-1000 N/mm ²	S355J2	1.0577	70
			C60	1.0601	
			31CrMo12	1.8515	
P3	800-1200 N/mm ²	42CrMo4	1.7225	70	
		36CrNiMo4	1.6511		
		X36CrMo17	1.2316		
		HS 6-5-2	1.3343		
M	M1	< 1000 N/mm ²	X5CrNi18-10	1.4301	55
			X6CrNiTi18-10	1.4571	
			X8CrNiS18-9	1.4305	
	M2	< 1000 N/mm ²	X17CrNi16-2	1.4057	50
			X90CrMoV18	1.4112	
	M3	< 1300 N/mm ²	X2CrTi12	1.4512	50
X2CrNiMoN22-5-3			1.4462		
K	K1	300 HB	X2CrNiMoN25-7-4	1.441	80
			X2CrNiMoCuWn25-7-4	1.4501	
			EN-GJL-150	0.6015	
	K2	350 HB	EN-GJL-250	0.6025	75
			EN-GJL-300	0.603	
			EN-GJS-400-15	0.704	
K3	1000 N/mm ² 350 HB	EN-GJS-600-3	0.706	65	
		EN-GJS-700-2	0.707		
N	N1	< 450 N/mm ²	EN-GJS1000-5	0.707	x
			EN-GJV250	0.707	
			EN-GJV400	0.707	
	N2	< 600 N/mm ²	Al99,5H	3.025	120
			AlMgSi1	3.2315	
			AlZn4,5Mg	3.4335	
	N3	< 500 N/mm ²	GD-AlSi5Cu1Mg	3.2134	x
			GD-AlSi8Cu3	3.2162	
			G-AlSi9Mg	3.2373	
	N4	langspanend	G-AlSi12	3.2581	80
			GDMgAl8Zn1	3.5812.08	
	N5	kurzspanend	CuZn20	2.025	65
CuZn37Pb0,5			2.0332		
N6	langspanend	CuZn39Pb2	2.038	x	
		CuZn43Pb2	2.041		
S	S1	< 1200 N/mm ²	Ampco	3.7025	45
			Titan	3.7115	
			TiAl5Sn2	3.7165	
	S2	< 1400 N/mm ²	TiAl6V4	3.7165	45
Hastelloy C4			2.461		
H	H1	45-55 HRC	Inconel 718	2.4668	40
			Nimonic	2.4634	
	H2	55-66 HRC	Hardox		30
			PM30		

Bitte beachten:

Die in den jeweiligen Spalten angegebenen Schnittwerte sind Richtwerte, diese müssen je nach Einsatzbedingungen (Material, Schmierung, Werkzeugspannung, Maschine, usw.) angepasst werden.

Je nach Einsatzfall können die optimalen Schnittwerte um bis zu ±30 % der Tabelle abweichen!

TMD-NX

 53948
 53949
 53950


Frästeildurchmesser [d1] / Vorschub pro Zahn [f _z]											
Ø1-1,8		Ø1,81-2,4	Ø2,41-2,7	Ø2,71-3,1	Ø3,11-3,8	Ø3,81-4,6	Ø4,61-6,2	Ø6,21-7,5	Ø7,51-9,0	Ø9,01-16	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0,008	0,008	0,012	0,014	0,018	0,026	0,028	0,030	0,035	0,040	0,048	●
0,008	0,008	0,012	0,014	0,018	0,026	0,028	0,030	0,035	0,040	0,048	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,005	0,005	0,007	0,008	0,010	0,014	0,016	0,018	0,020	0,026	0,033	●
0,008	0,008	0,012	0,014	0,016	0,020	0,024	0,030	0,036	0,040	0,048	●
0,008	0,008	0,012	0,014	0,016	0,020	0,024	0,030	0,036	0,040	0,048	●
0,007	0,007	0,011	0,013	0,015	0,018	0,022	0,028	0,033	0,038	0,046	●
x	x	x	x	x	x	x	x	x	x	x	○
0,007	0,007	0,011	0,013	0,015	0,018	0,022	0,028	0,033	0,038	0,046	○
x	x	x	x	x	x	x	x	x	x	x	○
0,008	0,008	0,012	0,014	0,016	0,020	0,024	0,030	0,036	0,040	0,048	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,048	●
x	x	x	x	x	x	x	x	x	x	x	○
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,007	0,007	0,010	0,011	0,012	0,016	0,020	0,025	0,030	0,036	0,044	●
0,005	0,005	0,008	0,009	0,010	0,014	0,018	0,022	0,028	0,033	0,042	●

- optimal geeignet
- gut geeignet
- nicht geeignet

Arbeitsrichtwerte

Kernlochdurchmesser Gewindeschneiden

Metrische ISO-Regelgewinde DIN 13					Metrische ISO-Feingewinde DIN 13					UNC-Gewinde ASME B1.1						
Nenn- Ø	Steig- ung P	Kern- loch- (Bohr-) Ø DIN 336 mm	Kern-Ø Muttergewinde 6H*		Nenn- Ø	Steig- ung P	Kern- loch- (Bohr-) Ø DIN 336 mm	Kern-Ø Muttergewinde 6H*		Nenn- Ø	Gang pro inch	Kern- loch- (Bohr-) Ø DIN 336 mm	Kern-Ø Muttergewinde 2B			
			min. mm	max. mm				min. mm	max. mm				min. mm	max. mm		
M 1	0,25	0,75	0,729	0,785	M 2,5 x 0,35	2,15	2,121	2,221	M 22 x 1,00	21,00	20,917	21,153	Nr. 1 - 64	1,55	1,425	1,580
M 1,1	0,25	0,85	0,829	0,885	M 3,0 x 0,35	2,65	2,621	2,721	M 22 x 1,50	20,50	20,376	20,676	Nr. 2 - 56	1,85	1,694	1,872
M 1,2	0,25	0,95	0,929	0,985	M 3,5 x 0,35	3,15	3,121	3,221	M 22 x 2,00	20,00	19,835	20,210	Nr. 3 - 48	2,10	1,941	2,146
M 1,4	0,30	1,10	1,075	1,142	M 4,0 x 0,50	3,50	3,459	3,599	M 24 x 1,00	23,00	22,917	23,153	Nr. 4 - 40	2,35	2,157	2,385
M 1,6	0,35	1,25	1,221	1,321	M 4,5 x 0,50	4,00	3,959	4,099	M 24 x 1,50	22,50	22,376	22,676	Nr. 5 - 40	2,65	2,487	2,698
M 1,8	0,35	1,45	1,421	1,521	M 5,0 x 0,50	4,50	4,459	4,599	M 24 x 2,00	22,00	21,835	22,210	Nr. 6 - 32	2,85	2,642	2,896
M 2	0,40	1,60	1,567	1,679	M 5,5 x 0,50	5,00	4,959	5,099	M 25 x 1,00	24,00	23,917	24,153	Nr. 8 - 32	3,50	3,302	3,531
M 2,2	0,45	1,75	1,713	1,838	M 6,0 x 0,75	5,20	5,188	5,378	M 25 x 1,50	23,50	23,376	23,676	Nr. 10 - 24	3,90	3,683	3,937
M 2,5	0,45	2,05	2,013	2,138	M 7,0 x 0,75	6,20	6,188	6,378	M 25 x 2,00	23,00	22,835	23,210	Nr. 12 - 24	4,50	4,343	4,597
M 3	0,50	2,50	2,459	2,599	M 8,0 x 0,50	7,50	7,459	7,599	M 27 x 1,00	26,00	25,917	26,153	1/4 - 20	5,10	4,978	5,258
M 3,5	0,60	2,90	2,850	3,010	M 8,0 x 0,75	7,20	7,188	7,378	M 27 x 1,50	25,50	25,376	25,676	5/16 - 18	6,60	6,401	6,731
M 4	0,70	3,30	3,242	3,422	M 8,0 x 1,00	7,00	6,917	7,153	M 27 x 2,00	25,00	24,835	25,210	3/8 - 16	8,00	7,798	8,153
M 4,5	0,75	3,70	3,688	3,878	M 9,0 x 0,75	8,20	8,188	8,378	M 28 x 1,00	27,00	26,917	27,153	7/16 - 14	9,40	9,144	9,550
M 5	0,80	4,20	4,134	4,334	M 9,0 x 1,00	8,00	7,917	8,153	M 28 x 1,50	26,50	26,376	26,676	1/2 - 13	10,80	10,592	11,024
M 6	1,00	5,00	4,917	5,153	M 10 x 0,75	9,20	9,188	9,378	M 28 x 2,00	26,00	25,835	26,210	9/16 - 12	12,20	11,989	12,446
M 7	1,00	6,00	5,917	6,153	M 10 x 1,00	9,00	8,917	9,153	M 30 x 1,00	29,00	28,917	29,153	5/8 - 11	13,50	13,386	13,868
M 8	1,25	6,80	6,647	6,912	M 10 x 1,25	8,80	8,647	8,912	M 30 x 1,50	28,50	28,376	28,676	3/4 - 10	16,50	16,307	16,840
M 9	1,25	7,80	7,647	7,912	M 11 x 0,75	10,20	10,188	10,378	M 30 x 2,00	28,00	27,835	28,210	7/8 - 9	19,50	19,177	19,761
M 10	1,50	8,50	8,376	8,676	M 11 x 1,00	10,00	9,917	10,153	M 30 x 3,00	27,00	26,752	27,252	1 - 8	22,25	21,971	22,606
M 11	1,50	9,50	9,376	9,676	M 12 x 1,00	11,00	10,917	11,153	M 32 x 1,50	30,50	30,376	30,676	1 1/8 - 7	25,00	24,638	25,349
M 12	1,75	10,20	10,106	10,441	M 12 x 1,25	10,80	10,647	10,912	M 32 x 2,00	30,00	29,835	30,210	1 1/4 - 7	28,00	27,813	28,524
M 14	2,00	12,00	11,835	12,210	M 12 x 1,50	10,50	10,376	10,676	M 33 x 1,50	31,50	31,376	31,676	1 3/8 - 6	30,75	30,353	31,115
M 16	2,00	14,00	13,835	14,210	M 14 x 1,00	13,00	12,917	13,153	M 33 x 2,00	31,00	30,835	31,210	1 1/2 - 6	34,00	33,528	34,290
M 18	2,50	15,50	15,294	15,744	M 14 x 1,25	12,80	12,647	12,912	M 33 x 3,00	30,00	29,752	30,252	1 3/4 - 5	39,50	38,938	39,802
M 20	2,50	17,50	17,294	17,744	M 14 x 1,50	12,50	12,376	12,676	M 35 x 1,50	33,50	33,376	33,676	2 - 4,5	45,00	44,679	45,593
M 22	2,50	19,50	19,294	19,744	M 15 x 1,00	14,00	13,917	14,153	M 36 x 1,50	34,50	34,376	34,676				
M 24	3,00	21,00	20,752	21,252	M 15 x 1,50	13,50	13,376	13,676								
M 27	3,00	24,00	23,752	24,252	M 16 x 1,00	15,00	14,917	15,153								
M 30	3,50	26,50	26,211	26,771	M 16 x 1,25	14,80	14,647	14,912								
M 33	3,50	29,50	29,211	29,771	M 16 x 1,50	14,50	14,376	14,676								
M 36	4,00	32,00	31,670	32,270	M 17 x 1,00	16,00	15,917	16,153								
M 39	4,00	35,00	34,670	35,270	M 17 x 1,50	15,50	15,376	15,676								
M 42	4,50	37,50	37,129	37,799	M 18 x 1,00	17,00	16,917	17,153								
M 45	4,50	40,50	40,129	40,799	M 18 x 1,50	16,50	16,376	16,676								
M 48	5,00	43,00	42,587	43,297	M 20 x 1,00	19,00	18,917	19,153								
M 52	5,00	47,00	46,587	47,297	M 20 x 1,50	18,50	18,376	18,676								
M 56	5,50	50,50	50,046	50,796	M 20 x 2,00	18,00	17,835	18,210								

* M 1,1 bis M 1,4 Kern-Ø Muttergewinde 5H

Die jeweils passenden Spiralbohrer finden Sie unter anderem in unserem Gesamtkatalog oder auch unter www.stock.de.

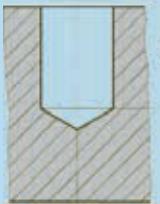
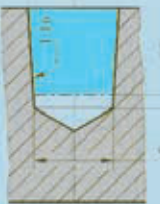
MJ-Gewinde DIN ISO 5855					
Nenn- Ø	x	Steig- ung P	Kern- loch- (Bohr-) Ø	Kern-Ø Muttergewinde 5H*	
				min. mm	max. mm
MJ 3	x	0,50	2,60	2,513	2,653
MJ 4	x	0,70	3,40	3,318	3,498
MJ 5	x	0,80	4,30	4,221	4,421
MJ 6	x	0,50	5,55	5,513	5,625
MJ 6	x	0,75	5,35	5,269	5,419
MJ 6	x	1,00	5,10	5,026	5,216
MJ 8	x	0,50	7,55	7,513	7,625
MJ 8	x	0,75	7,35	7,269	7,419
MJ 8	x	1,00	7,10	7,026	7,216
MJ 8	x	1,25	6,90	6,782	6,994
MJ 10	x	1,00	9,10	9,026	9,216
MJ 10	x	1,25	8,90	8,782	8,994
MJ 10	x	1,50	8,60	8,539	8,775
MJ 12	x	1,75	10,40	10,295	10,560
MJ 16	x	2,00	14,20	14,051	14,351

* MJ 3 x 0,50 bis MJ 5 x 0,80 Kern-Ø Muttergewinde 6H

UNJC-Gewinde ISO 3161				
Nenn- Ø	Gang pro inch	Kern- loch- (Bohr-) Ø	Kern-Ø Muttergewinde 3B	
			min. mm	max. mm
Nr. 6	- 32	2,85	2,733	2,939
Nr. 8	- 32	3,55	3,393	3,599
Nr. 10	- 24	4,00	3,795	4,064
Nr. 12	- 24	4,60	4,455	4,704
1/4	- 20	5,30	5,113	5,387
5/16	- 18	6,75	6,563	6,833
3/8	- 16	8,20	7,978	8,255
7/16	- 14	9,60	9,346	9,639
1/2	- 13	11,00	10,798	11,095
9/16	- 12	12,40	12,228	12,482
5/8	- 11	13,80	13,627	13,904

UNJF-Gewinde ISO 3161				
Nenn- Ø	Gang pro inch	Kern- loch- (Bohr-) Ø	Kern-Ø Muttergewinde 3B	
			min. mm	max. mm
Nr. 6	- 40	3,00	2,888	3,053
Nr. 8	- 36	3,60	3,480	3,663
Nr. 10	- 32	4,20	4,054	4,255
Nr. 12	- 28	4,75	4,602	4,816
1/4	- 28	5,60	5,466	5,662
5/16	- 24	7,00	6,906	7,109
3/8	- 24	8,60	8,494	8,679
7/16	- 20	10,00	9,876	10,084
1/2	- 20	11,60	11,463	11,661
9/16	- 18	13,00	12,913	13,122
5/8	- 18	14,60	14,501	14,702

UNF-Gewinde ASME B1.1					BSW-(Whitworth)-Gewinde BS84					(Whitworth-) Rohrgewinde (nach DIN-ISO 228-1)					Stahlpanzerrohr-Gewinde nach DIN 40430				
Nenn-Ø	Gang pro inch	Kernloch-(Bohr-)Ø DIN 336 mm	Kern-Ø Muttergewinde 2B		Nenn-Ø inch	Gang pro inch	Kernloch-(Bohr-)Ø mm	Kern-Ø Muttergewinde		Nenn-Ø inch	Gang pro inch	Kernloch-(Bohr-)Ø DIN 336 mm	Kern-Ø Muttergewinde		Nenn-Ø inch	Gang pro inch	Kernloch-(Bohr-)Ø mm	Kern-Ø Muttergewinde	
			min. mm	max. mm				min. mm	max. mm				min. mm	max. mm				min. mm	max. mm
Nr. 1 - 72		1,55	1,473	1,610	W 1/16	60	1,20	1,045	1,230	G 1/16	28	6,80	6,561	6,843	Pg 7	20	11,40	11,280	11,430
Nr. 2 - 64		1,85	1,755	1,910	W 3/32	48	1,80	1,704	1,912	G 1/8	28	8,80	8,566	8,848	Pg 9	18	14,00	13,860	14,010
Nr. 3 - 56		2,15	2,024	2,197	W 1/8	40	2,50	2,362	2,591	G 1/4	19	11,80	11,445	11,890	Pg 11	18	17,30	17,260	17,410
Nr. 4 - 48		2,40	2,271	2,459	W 5/32	32	3,20	2,952	3,214	G 3/8	19	15,25	14,950	15,395	Pg 13,5	18	19,00	19,060	19,210
Nr. 5 - 44		2,70	2,550	2,741	W 3/16	24	3,60	3,407	3,745	G 1/2	14	19,00	18,631	19,172	Pg 16	18	21,30	21,160	21,310
Nr. 6 - 40		2,95	2,819	3,023	W 7/32	24	4,50	4,201	4,539	G 5/8	14	21,00	20,587	21,128	Pg 21	16	26,90	26,780	27,030
Nr. 8 - 36		3,50	3,404	3,607	W 1/4	20	5,10	4,724	5,156	G 3/4	14	24,50	24,117	24,658	Pg 29	16	35,50	35,480	35,730
Nr. 10 - 32		4,10	3,962	4,166	W 5/16	18	6,50	6,130	6,590	G 7/8	14	28,25	27,877	28,418	Pg 36	16	45,50	45,480	45,730
Nr. 12 - 28		4,60	4,496	4,724	W 3/8	16	7,90	7,492	7,987	G 1	11	30,75	30,291	30,931	Pg 42	16	52,50	52,480	52,730
1/4 - 28		5,50	5,359	5,588	W 7/16	14	9,20	8,789	9,330	G 1 1/8	11	35,50	34,939	35,579	Pg 48	16	57,80	57,780	58,030
5/16 - 24		6,90	6,782	7,036	W 1/2	12	10,50	9,989	10,591	G 1 1/4	11	39,50	38,952	39,592					
3/8 - 24		8,50	8,382	8,636	W 9/16	12	12,00	11,577	12,179	G 1 1/2	11	45,25	44,845	45,485					
7/16 - 20		9,90	9,728	10,033	W 5/8	11	13,50	12,918	13,558	G 1 3/4	11	51,00	50,788	51,428					
1/2 - 20		11,50	11,328	11,608	W 3/4	10	16,25	15,797	16,483	G 2	11	57,00	56,656	57,296					
9/16 - 18		12,90	12,751	13,081	W 7/8	9	19,25	18,611	19,353										
5/8 - 18		14,50	14,351	14,681	W 1	8	22,00	21,334	22,147										
3/4 - 16		17,50	17,323	17,678	W 1 1/8	7	24,50	23,928	24,832										
7/8 - 14		20,40	20,269	20,650	W 1 1/4	7	27,75	27,103	28,007										
1 - 12		23,25	23,114	23,571	W 1 3/8	6	30,50	29,504	30,528										
1 1/8 - 12		26,50	26,289	26,746	W 1 1/2	6	33,50	32,679	33,703										
1 1/4 - 12		29,50	29,464	29,921	W 1 5/8	5	35,50	34,769	35,963										
1 3/8 - 12		32,75	32,639	33,096	W 1 3/4	5	39,00	37,944	39,138										
1 1/2 - 12		36,00	35,814	36,271	W 2	4,5	44,50	43,571	44,877										

NPT ANSI B 2.1 Amerik. kegeliges Rohrgewinde Kegel 1:16							
Ausführung A (möglichst vermeiden)	Ausführung B	Nenn-Ø	Gang pro inch	Kernloch-Ø zylindr. (A) d ₁	Kernloch-Ø konisch (B) D ₁	Einschneidtiefe ET mm	Bohrtiefe BT (min) mm
		1/16	- 27	6,15	6,39	9,29	10,7
		1/8	- 27	8,40	8,74	9,32	10,8
		1/4	- 18	11,10	11,36	13,52	15,6
		3/8	- 18	14,30	14,80	13,83	16,0
		1/2	- 14	17,90	18,32	18,07	20,8
		3/4	- 14	23,30	23,67	18,55	21,3
		1	- 11,5	29,00	29,69	22,29	25,6
		1 1/4	- 11,5	37,70	38,45	22,80	26,1
		1 1/2	- 11,5	43,70	44,52	22,80	26,1
		2	- 11,5	55,60	56,56	23,20	26,5
		2 1/2	- 8	66,30	67,62	31,75	36,3
		3	- 8	82,30	83,52	33,74	38,5

EG-Gewinde Metr./Metr. Fein (EG M 14 x 1,25) für Gewindedrahteinsätze DIN 8140				
Nenn-Ø	x Steigung P mm	Kernloch-(Bohr-)Ø mm	Kern-Ø Muttergewinde	
			min. mm	max. mm
EG M 4	0,70	4,20	4,152	4,292
EG M 5	0,80	5,25	5,174	5,334
EG M 6	1,00	6,30	6,217	6,407
EG M 8	1,25	8,40	8,271	8,483
EG M 10	1,50	10,50	10,324	10,560
EG M 12	1,75	12,50	12,379	12,644
EG M 14 x	1,25	14,40	14,271	14,483
EG M 16	2,00	16,50	16,433	16,733

EG UNC (UNC-STI) Gewinde für Gewindedrahteinsätze ASME B18.29.1				
Nenn-Ø	Gang pro inch	Kernloch-(Bohr-)Ø mm	Kern-Ø Muttergewinde	
		mm	min. mm	max. mm
EG Nr. 6	- 32	3,80	3,678	3,879
EG Nr. 8	- 32	4,40	4,338	4,524
EG Nr. 10	- 24	5,20	5,055	5,283
EG Nr. 12	- 24	5,80	5,715	5,944
EG 1/4	- 20	6,70	6,624	6,868
EG 5/16	- 18	8,40	8,242	8,489
EG 3/8	- 16	10,00	9,868	10,127
EG 7/16	- 14	11,60	11,506	11,783
EG 1/2	- 13	13,30	13,122	13,393
EG 9/16	- 12	14,90	14,747	15,032
EG 5/8	- 11	16,50	16,375	16,673

EG UNF (UNF-STI) Gewinde für Gewindedrahteinsätze ASME B18.29.1				
Nenn-Ø	Gang pro inch	Kernloch-(Bohr-)Ø mm	Kern-Ø Muttergewinde	
		mm	min. mm	max. mm
EG Nr. 6	- 40	3,70	3,644	3,818
EG Nr. 8	- 36	4,40	4,321	4,498
EG Nr. 10	- 32	5,10	4,999	5,184
EG Nr. 12	- 28	5,70	5,682	5,809
EG 1/4	- 28	6,60	6,546	6,721
EG 5/16	- 24	8,25	8,166	8,352
EG 3/8	- 24	9,80	9,754	9,931
EG 7/16	- 20	11,50	11,389	11,585
EG 1/2	- 20	13,10	12,974	13,172
EG 9/16	- 18	14,70	14,592	14,798
EG 5/8	- 18	16,25	16,180	16,386

Arbeitsrichtwerte

Empfohlene Bohrdurchmesser Gewindeformen

Metrische ISO-Gewinde DIN 13						
Nenn-Ø	Steigung P	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde 7H*	
			min. mm	max. mm	min. mm	max. mm
mm		mm				
M1	0,25	0,90	0,89	0,92	0,729	0,819
M1,2	0,25	1,10	1,09	1,12	0,929	1,019
M1,4	0,30	1,28	1,27	1,30	1,075	1,181
M1,6	0,35	1,46	1,45	1,48	1,221	1,346
M1,7	0,35	1,56	1,55	1,58	1,321	1,446
M1,8	0,35	1,66	1,65	1,68	1,421	1,546
M 2	0,40	1,85	1,84	1,88	1,567	1,679
M 2,2	0,45	2,00	2,01	2,05	1,713	1,838
M 2,5	0,45	2,30	2,28	2,32	2,013	2,138
M 3	0,50	2,80	2,78	2,85	2,459	2,639
M 3,5	0,60	3,25	3,23	3,30	2,850	3,050
M 4	0,70	3,70	3,68	3,76	3,242	3,466
M 4,5	0,75	4,20				
M 5	0,80	4,65	4,62	4,71	4,134	4,384
M 6	1,00	5,55	5,52	5,62	4,917	5,217
M 7	1,00	6,55	6,52	6,62	5,917	6,217
M 8	1,25	7,40	7,36	7,47	6,647	6,982
M 9	1,25	8,40	8,36	8,47	7,647	7,982
M 10	1,50	9,30	9,26	9,38	8,376	8,751
M 11	1,50	10,30	10,26	10,38	9,376	9,751
M 12	1,75	11,20	11,15	11,29	10,106	10,531
M 14	2,00	13,10	13,05	13,20	11,835	12,310
M 16	2,00	15,10	15,05	15,20	13,835	14,310
M 18	2,50	16,90	16,83	17,02	15,294	15,854
M 20	2,50	18,90	18,83	19,02	17,294	17,854
M 22	2,50	20,90	20,83	21,02	19,294	19,854
M 24	3,00	22,70	22,62	22,80	20,752	21,382
M 27	3,00	25,70	25,62	25,80	23,752	24,382
M 30	3,50	28,50	28,40	28,60	26,211	26,921
M 33	3,50	31,50	31,40	31,60	29,211	29,921
M 36	4,00	34,30	34,17	34,40	31,670	32,420
M 39	4,00	37,30	37,17	37,40	34,670	35,420
M 42	4,50	40,10	39,95	40,20	37,129	37,979

* M 2 bis M 2,5 Kern-Ø Muttergewinde 6H

Metrische ISO-Feingewinde DIN 13													
Nenn-x Ø	Steigung P	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde 7H*		Nenn-x Ø	Steigung P	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde 7H*	
			min. mm	max. mm	min. mm	max. mm				min. mm	max. mm	min. mm	max. mm
mm		mm					mm		mm				
M 2,5 x 0,35		2,35	2,35	2,38	2,121	2,221	M 17 x 1,00		16,55	16,52	16,62	15,917	16,217
M 3 x 0,35		2,85	2,85	2,88	2,621	2,721	M 17 x 1,50		16,30	16,26	16,38	15,376	15,751
M 4 x 0,35		3,85	3,85	3,88	3,621	3,721	M 18 x 1,00		17,55	17,52	17,62	16,917	17,217
M 4 x 0,50		3,80	3,78	3,83	3,459	3,639	M 18 x 1,50		17,30	17,26	17,38	16,376	16,751
M 5 x 0,50		4,80	4,78	4,83	4,459	4,639	M 18 x 2,00		17,10	17,05	17,20	15,835	16,310
M 5,5 x 0,50		5,30	5,28	5,33	4,959	5,139	M 20 x 1,00		19,55	19,52	19,62	18,917	19,217
M 6 x 0,75		5,65	5,62	5,70	5,188	5,424	M 20 x 1,50		19,30	19,26	19,38	18,376	19,751
M 7 x 0,75		6,65	6,62	6,70	6,188	6,424	M 24 x 1,00		23,55	23,52	23,62	22,917	23,217
M 8 x 0,75		7,65	7,62	7,70	7,188	7,424	M 24 x 1,50		23,30	23,26	23,38	22,376	22,751
M 8 x 1,00		7,55	7,52	7,62	6,917	7,217	M 24 x 2,00		23,10	23,05	23,20	21,835	22,310
M 9 x 0,75		8,65	8,62	8,70	8,188	8,424	M 27 x 1,50		26,30	26,26	26,38	25,376	25,751
M 9 x 1,00		8,55	8,52	8,62	7,917	8,217	M 30 x 1,50		29,30	29,26	29,38	28,376	28,751
M 10 x 0,75		9,65	9,62	9,70	9,188	9,424	M 33 x 1,50		32,30	32,26	32,38	31,376	31,751
M 10 x 1,00		9,55	9,52	9,62	8,917	9,217	M 36 x 1,50		35,30	35,26	35,38	34,376	34,751
M 10 x 1,25		9,40	9,36	9,47	8,647	8,982	M 39 x 1,50		38,30	38,26	38,38	37,376	37,751
M 11 x 0,75		10,65	10,62	10,70	10,188	10,424	M 42 x 1,50		41,30	41,26	41,38	42,376	42,751
M 11 x 1,00		10,55	10,52	10,62	9,917	10,217							
M 12 x 1,00		11,55	11,52	11,62	10,917	11,217							
M 12 x 1,25		11,40	11,36	11,47	10,647	10,982							
M 12 x 1,50		11,30	11,26	11,38	10,376	10,751							
M 14 x 1,00		13,55	13,52	13,62	12,917	13,217							
M 14 x 1,25		13,40	13,36	13,47	12,647	12,982							
M 14 x 1,50		13,30	13,26	13,38	12,376	12,751							
M 15 x 1,00		14,55	14,52	14,62	13,917	14,217							
M 15 x 1,50		14,30	14,26	14,38	13,376	13,751							
M 16 x 1,00		15,55	15,52	15,62	14,917	15,217							
M 16 x 1,50		15,30	15,26	15,38	14,376	14,751							

* M 2,5 x 0,35 bis M 4 x 0,35 Kern-Ø Muttergewinde 6H

Kerndurchmesser-Toleranzfeld beim Gewindeformen (nach DIN 13, Teil 50)

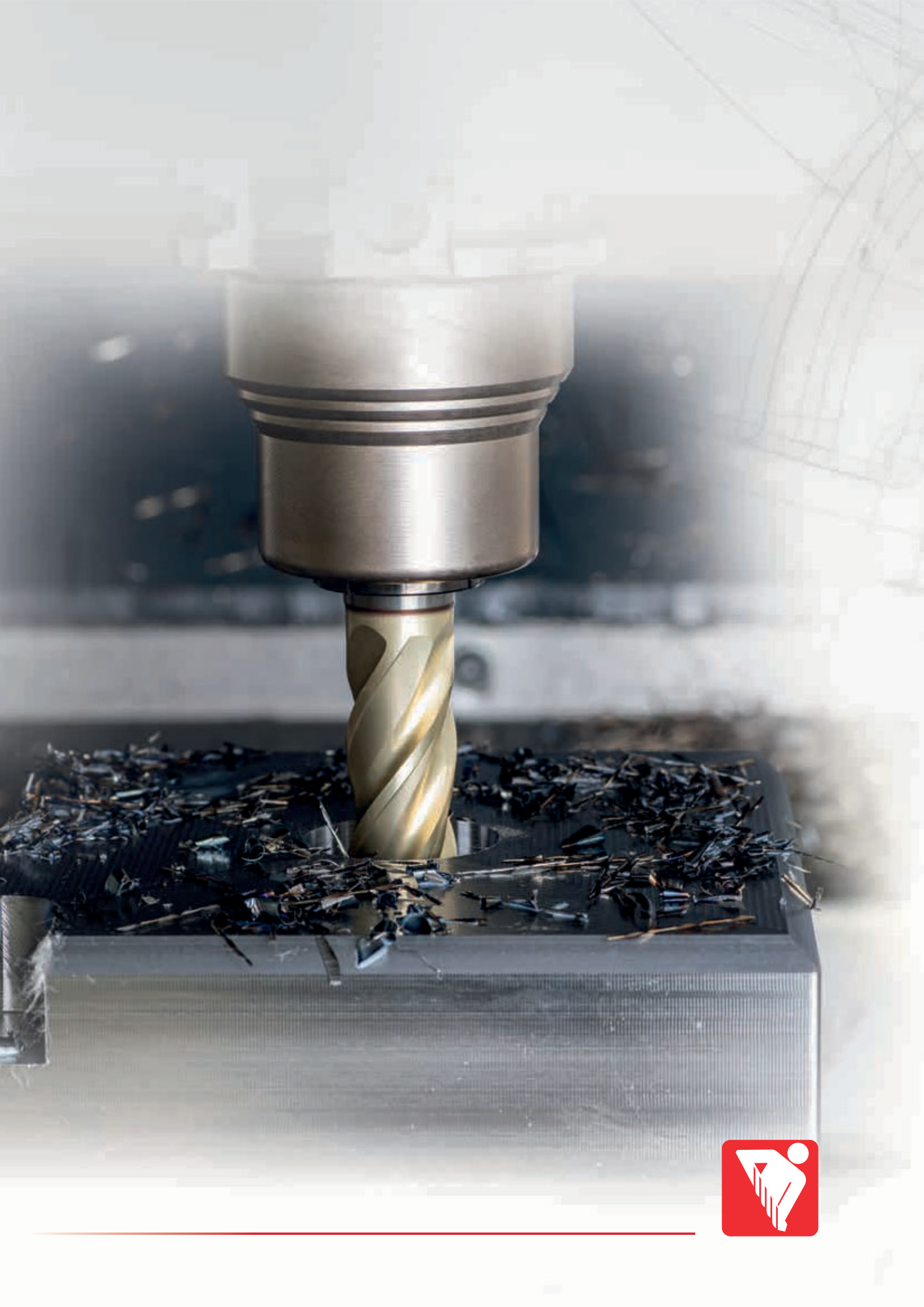
Aus Festigkeitsgründen ist es nicht erforderlich, die Kerndurchmessertoleranzen der Toleranzklasse 6H einzuhalten; die Toleranzklasse 7H genügt dem Anspruch, dass die Flankenüberdeckung von Außen- und Muttergewinde 0,32 x P nicht unterschreiten soll. Außerdem haben geformte Gewinde wegen des nicht unterbrochenen Faserverlaufs und der erfolgten Kaltverfestigung im Regelfall eine höhere Festigkeit als geschnittene Gewinde.

UNC-Gewinde ASME B1.1						
Nenn-Ø	Gang	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde 2B	
			min. mm	max. mm	min. mm	max. mm
pro inch		mm				
Nr. 1 - 64		1,68	1,67	1,70	1,425	1,580
Nr. 2 - 56		1,98	1,97	2,01	1,694	1,872
Nr. 3 - 48		2,28	2,27	2,32	1,941	2,146
Nr. 4 - 40		2,55	2,54	2,59	2,157	2,385
Nr. 5 - 40		2,90	2,89	2,94	2,487	2,698
Nr. 6 - 32		3,15	3,14	3,19	2,642	2,896
Nr. 8 - 32		3,80	3,78	3,82	3,302	3,531
Nr. 10 - 24		4,35	4,33	4,39	3,683	3,937
Nr. 12 - 24		5,00	4,97	5,03	4,343	4,597
1/4 - 20		5,75	5,72	5,80	4,978	5,258
5/16 - 18		7,30	7,26	7,37	6,401	6,731
3/8 - 16		8,80	8,77	8,88	7,798	8,153
7/16 - 14		10,30	10,27	10,37	9,144	9,550
1/2 - 13		11,80	11,77	11,88	10,592	11,024
9/16 - 12		13,30	13,28	13,39	11,989	12,446
5/8 - 11		14,80	14,78	14,90	13,386	13,868
3/4 - 10		17,90	17,85	17,97	16,307	16,840
7/8 - 9		21,00	20,95	21,10	19,177	19,761
1 - 8		24,00	23,95	24,12	21,971	22,606

UNF-Gewinde ASME B1.1						
Nenn-Ø	Gang	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde 2B	
			min. mm	max. mm	min. mm	max. mm
pro inch		mm				
Nr. 1 - 72		1,70	1,69	1,72	1,473	1,610
Nr. 2 - 64		2,00	1,99	2,03	1,755	1,910
Nr. 3 - 56		2,30	2,29	2,34	2,024	2,197
Nr. 4 - 48		2,60	2,59	2,63	2,271	2,459
Nr. 5 - 44		2,90	2,89	2,93	2,550	2,741
Nr. 6 - 40		3,20	3,19	3,24	2,819	3,023
Nr. 8 - 36		3,85	3,83	3,88	3,404	3,607
Nr. 10 - 32		4,45	4,43	4,49	3,962	4,166
Nr. 12 - 28		5,10	5,07	5,13	4,496	4,724
1/4 - 28		5,95	5,92	5,99	5,359	5,588
5/16 - 24		7,45	7,42	7,50	6,782	7,036
3/8 - 24		9,05	9,02	9,10	8,838	9,103
7/16 - 20		10,55	10,48	10,58	9,728	10,033
1/2 - 20		12,10	12,08	12,18	11,328	11,608
9/16 - 18		13,65	13,61	13,72	12,751	13,081
5/8 - 18		15,25	15,21	15,32	14,351	14,681
3/4 - 16		18,35	18,30	18,41	17,323	17,678
7/8 - 14		21,40	21,35	21,49	20,269	20,650
1 - 12		24,45	24,40	24,54	23,114	23,571

(Whitworth-) Rohrgewinde G DIN EN ISO 228-1						
Nenn-Ø	Gang	Bohr-Ø	Bohr-Ø		Kern-Ø Muttergewinde	
			min. mm	max. mm	min. mm	max. mm
inch	pro inch	mm				
G 1/16 28		7,30	7,28	7,35	6,561	6,843
G 1/8 28		9,30	9,28	9,35	8,566	8,848
G 1/4 19		12,50	12,48	12,55	11,445	11,890
G 3/8 19		16,00	15,98	16,05	14,950	15,395
G 1/2 14		20,00	19,98	20,12	18,631	19,172
G 5/8 14		22,00	21,98	22,12	20,587	21,128
G 3/4 14		25,50	25,48	25,62	24,117	24,658
G 7/8 14		29,25	29,23	29,37	27,877	28,418
G 1 11		32,00	31,98	32,15	30,291	30,931
G 1 1/4 11		40,75	40,70	40,85	38,952	39,592

Arbeitsrichtwerte



SuperF-UT stabile Verhältnisse

Empfehlung für glattschneidige Fräswerkzeuge.



Korrekturfaktoren		
a_p Schruppen > 1,5xD	! v_c -25 %	! f_z -25 %
mittellange Werkzeuge	! v_c -40 %	! f_z -40 %
extralange Werkzeuge	! v_c -60 %	! f_z -55 %

Material	Härte	Anwendung	a_e max.	v_c	f_z (mm/z) bei Nenn-Ø									
					3	4	6	8	10	12	16	20	25	
P Bau- und Automatenstähle, unlegierte Vergütungs- und Einsatzstähle 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37, 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E, 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm ²	Nuten	1xD	180	0,016	0,021	0,031	0,042	0,060	0,072	0,100	0,120	0,150	
		Schruppen	0,75xD	210	0,018	0,024	0,036	0,048	0,069	0,083	0,110	0,140	0,170	
		Schlichten	0,02xD	360	0,017	0,023	0,034	0,046	0,066	0,079	0,110	0,130	0,170	
P Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20, 1.0601 C60, 1.1221 C60E 1.7043 38Cr4, 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1200 N/mm ²	Nuten	1xD	160	0,014	0,019	0,029	0,038	0,055	0,066	0,090	0,110	0,140	
		Schruppen	0,75xD	190	0,017	0,022	0,033	0,044	0,063	0,076	0,100	0,130	0,160	
		Schlichten	0,02xD	320	0,016	0,021	0,032	0,042	0,061	0,073	0,100	0,120	0,150	
P Legierte Vergütungsstähle, Werkzeug- und Schnellarbeitsstähle 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3, Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1400 N/mm ²	Nuten	1xD	135	0,014	0,018	0,027	0,036	0,050	0,060	0,080	0,100	0,130	
		Schruppen	0,75xD	160	0,016	0,021	0,031	0,041	0,058	0,069	0,090	0,120	0,140	
		Schlichten	0,02xD	270	0,015	0,020	0,030	0,040	0,055	0,066	0,090	0,110	0,140	
H Gehärteter Stahl Werkzeugstahl, Vergütungstahl, Federstahl, Schnellarbeitsstahl, Einsatzstahl, etc. z. B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	Nuten	1xD	70	0,011	0,014	0,021	0,028	0,040	0,048	0,060	0,080	0,100	
		Schruppen	0,33xD	100	0,014	0,018	0,027	0,036	0,052	0,062	0,080	0,100	0,130	
		Schlichten	0,01xD	140	0,011	0,014	0,021	0,028	0,040	0,048	0,060	0,080	0,100	
M Rostfreier Stahl 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm ²	Nuten	1xD	120	0,014	0,018	0,027	0,036	0,050	0,060	0,080	0,100	0,130	
		Schruppen	0,75xD	140	0,016	0,021	0,031	0,041	0,058	0,069	0,090	0,120	0,140	
		Schlichten	0,02xD	240	0,015	0,020	0,030	0,040	0,055	0,066	0,090	0,110	0,140	
M Rostfreier Stahl 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	Nuten	1xD	80	0,012	0,016	0,024	0,032	0,045	0,054	0,070	0,090	0,110	
		Schruppen	0,75xD	100	0,014	0,018	0,028	0,037	0,052	0,062	0,080	0,100	0,130	
		Schlichten	0,02xD	160	0,013	0,018	0,026	0,035	0,050	0,059	0,080	0,100	0,120	
M Rostfreier Stahl 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≤ 850 N/mm ²	Nuten	1xD	60	0,011	0,014	0,021	0,028	0,040	0,048	0,060	0,080	0,100	
		Schruppen	0,60xD	80	0,013	0,017	0,025	0,034	0,048	0,058	0,080	0,100	0,120	
		Schlichten	0,01xD	120	0,011	0,014	0,021	0,028	0,040	0,048	0,060	0,080	0,100	
S Sonderlegierungen (Nickelbasis "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1.300 N/mm ²	Nuten	1xD	30	0,008	0,011	0,017	0,022	0,032	0,038	0,050	0,060	0,080	
		Schruppen	0,60xD	40	0,010	0,013	0,020	0,027	0,038	0,046	0,060	0,080	0,100	
		Schlichten	0,01xD	60	0,008	0,011	0,017	0,022	0,032	0,038	0,050	0,060	0,080	
Ti Titanlegierungen ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1.300 N/mm ²	Nuten	1xD	60	0,012	0,016	0,024	0,032	0,045	0,054	0,070	0,090	0,110	
		Schruppen	0,60xD	80	0,014	0,019	0,029	0,038	0,054	0,065	0,090	0,110	0,140	
		Schlichten	0,02xD	120	0,013	0,018	0,026	0,035	0,050	0,059	0,080	0,100	0,120	
K Gusseisen, Grauguss, Temperguss und Kugelgraphitguss 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	Nuten	1xD	160	0,017	0,022	0,033	0,044	0,065	0,078	0,100	0,130	0,160	
		Schruppen	0,75xD	190	0,019	0,025	0,038	0,051	0,075	0,090	0,120	0,150	0,190	
		Schlichten	0,02xD	320	0,018	0,024	0,036	0,048	0,072	0,086	0,110	0,140	0,180	
K Gusseisen, Grauguss, Temperguss und Kugelgraphitguss 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	Nuten	1xD	140	0,015	0,020	0,030	0,040	0,055	0,066	0,090	0,110	0,140	
		Schruppen	0,75xD	170	0,017	0,023	0,035	0,046	0,063	0,076	0,100	0,130	0,160	
		Schlichten	0,02xD	280	0,017	0,022	0,033	0,044	0,061	0,073	0,100	0,120	0,150	
N Aluminum, Alu-Knetlegierungen, Alulegierungen 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	bis 3 % Si	Nuten	1xD	500	0,020	0,026	0,039	0,052	0,080	0,096	0,130	0,160	0,200	
		Schruppen	0,75xD	600	0,022	0,030	0,045	0,060	0,092	0,110	0,150	0,180	0,230	
		Schlichten	0,02xD	1000	0,021	0,029	0,043	0,057	0,088	0,106	0,140	0,180	0,220	
N Aluminum-Gusslegierungen 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, -G-AlSi12CuNiMg	≥ 7 % Si	Nuten	1xD	230	0,017	0,022	0,033	0,044	0,060	0,072	0,100	0,120	0,150	
		Schruppen	0,75xD	300	0,019	0,025	0,038	0,051	0,069	0,083	0,110	0,140	0,170	
		Schlichten	0,02xD	460	0,018	0,024	0,036	0,048	0,066	0,079	0,110	0,130	0,170	
N Magnesium-Legierungen MgMn2, G-MgAl8Zn1, G-MgAl6Zn3		Nuten	1xD	180	0,015	0,020	0,030	0,040	0,055	0,066	0,090	0,110	0,140	
		Schruppen	0,75xD	210	0,017	0,023	0,035	0,046	0,063	0,076	0,100	0,130	0,160	
		Schlichten	0,02xD	360	0,017	0,022	0,033	0,044	0,061	0,073	0,100	0,120	0,150	
N NE-Metalle (Kupfer, Messing oder Messing je kurz- und langspanend) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm ²	Nuten	1xD	250	0,017	0,022	0,033	0,044	0,060	0,072	0,100	0,120	0,150	
		Schruppen	0,75xD	290	0,019	0,025	0,038	0,051	0,069	0,083	0,110	0,140	0,170	
		Schlichten	0,02xD	500	0,018	0,024	0,036	0,048	0,066	0,079	0,110	0,130	0,170	

SuperF-UT instabile Verhältnisse

Empfehlung für kordelverzahnte Fräswerkzeuge.



Korrekturfaktoren		
a_p Schruppen >1,5xD	v_c -25 %	f_z -25 %
mittellange Werkzeuge	v_c -40 %	f_z -40 %
extralange Werkzeuge	v_c -60 %	f_z -55 %

Material	Härte	Anwendung	a_e max.	v_c	f_z (mm/z) bei Nenn-Ø									
					3	4	6	8	10	12	16	20	25	
P Bau- und Automatenstähle, unlegierte Vergütungs- und Einsatzstähle 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37, 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E, 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤850 N/mm²	Nuten	1xD	135	0,010	0,013	0,020	0,026	0,035	0,042	0,055	0,066	0,088	
		Schruppen	0,75xD	160	0,011	0,015	0,023	0,031	0,041	0,048	0,066	0,077	0,099	
P Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20, 1.0601 C60, 1.1221 C60E 1.7043 38Cr4, 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1200 N/mm²	Nuten	1xD	120	0,010	0,013	0,020	0,026	0,035	0,042	0,055	0,066	0,088	
		Schruppen	0,75xD	140	0,011	0,015	0,023	0,031	0,041	0,048	0,066	0,077	0,099	
P Legierte Vergütungsstähle, Werkzeug- und Schnellarbeitsstähle 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3, Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1400 N/mm²	Nuten	1xD	100	0,009	0,012	0,019	0,024	0,033	0,040	0,055	0,066	0,088	
		Schruppen	0,75xD	120	0,011	0,014	0,021	0,029	0,039	0,045	0,066	0,077	0,099	
H Gehärteter Stahl Werkzeugstahl, Vergütungsstahl, Federstahl, Schnellarbeitsstahl, Einsatzstahl, etc. z. B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤55HRC	Nuten	1xD	55	0,007	0,009	0,013	0,018	0,024	0,029	0,044	0,044	0,066	
	55-63HRC	Schruppen	0,33xD	80	0,009	0,011	0,018	0,023	0,032	0,037	0,055	0,066	0,077	
M Rostfreier Stahl 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤750 N/mm²	Nuten	1xD	90	0,009	0,012	0,019	0,024	0,033	0,040	0,055	0,066	0,088	
		Schruppen	0,75xD	100	0,011	0,014	0,021	0,029	0,039	0,045	0,066	0,077	0,099	
M Rostfreier Stahl 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	Nuten	1xD	65	0,009	0,011	0,017	0,022	0,031	0,037	0,044	0,066	0,077	
		Schruppen	0,75xD	80	0,010	0,013	0,019	0,025	0,035	0,043	0,055	0,066	0,088	
M Rostfreier Stahl 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≤850 N/mm²	Nuten	1xD	55	0,008	0,010	0,014	0,020	0,028	0,033	0,044	0,055	0,066	
		Schruppen	0,60xD	70	0,009	0,012	0,018	0,023	0,033	0,040	0,055	0,066	0,088	
S Sonderlegierungen (Nickelbasis "Ni") Nimonic, Inconel, Monel, Hastelloy	≤1.300 N/mm²	Nuten	1xD	25	0,007	0,009	0,013	0,018	0,024	0,029	0,044	0,044	0,066	
		Schruppen	0,60xD	40	0,008	0,011	0,015	0,021	0,029	0,035	0,044	0,055	0,077	
Ti Titanlegierungen ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤1.300 N/mm²	Nuten	1xD	50	0,008	0,010	0,014	0,020	0,028	0,033	0,044	0,055	0,066	
		Schruppen	0,60xD	70	0,009	0,012	0,018	0,023	0,033	0,040	0,055	0,066	0,088	
K Gusseisen, Grauguss, Temperguss und Kugelgraphitguss 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤240HB	Nuten	1xD	120	0,010	0,013	0,020	0,026	0,035	0,042	0,055	0,066	0,088	
		Schruppen	0,75xD	140	0,011	0,015	0,023	0,031	0,041	0,048	0,066	0,077	0,099	
K Gusseisen, Grauguss, Temperguss und Kugelgraphitguss 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥240HB	Nuten	1xD	105	0,009	0,012	0,019	0,024	0,033	0,040	0,055	0,066	0,088	
		Schruppen	0,75xD	130	0,011	0,014	0,021	0,029	0,039	0,045	0,066	0,077	0,099	
N Aluminum, Alu-Knetlegierungen, Alulegierungen 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤7 % Si	Nuten	1xD	375	0,012	0,015	0,023	0,031	0,041	0,048	0,066	0,077	0,099	
		Schruppen	0,75xD	440	0,013	0,018	0,026	0,035	0,047	0,056	0,077	0,099	0,121	
N Aluminum-Gusslegierungen 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, -G-AlSi12CuNiMg	≥7 % Si	Nuten	1xD	180	0,011	0,014	0,021	0,029	0,039	0,046	0,066	0,077	0,099	
		Schruppen	0,75xD	210	0,012	0,017	0,024	0,032	0,044	0,053	0,066	0,088	0,110	
N Magnesium-Legierungen MgMn2, G-MgAl8Zn1, G-MgAl6Zn3		Nuten	1xD	140	0,011	0,014	0,021	0,029	0,039	0,046	0,066	0,077	0,099	
		Schruppen	0,75xD	170	0,012	0,017	0,024	0,032	0,044	0,053	0,066	0,088	0,110	
N NE-Metalle (Kupfer, Messing oder Messing je kurz- und langspanend) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850 N/mm²	Nuten	1xD	200	0,011	0,014	0,021	0,029	0,039	0,046	0,066	0,077	0,099	
		Schruppen	0,75xD	230	0,012	0,017	0,024	0,032	0,044	0,053	0,066	0,088	0,110	

SuperF-UT Z



Nuten

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø									
						3	4	5	6	8	10	12	16	20	
P1/P2	leicht/mittel	0,80xD	1,00xD	180°	160	0,014	0,018	0,023	0,027	0,044	0,055	0,066	0,088	0,110	
P3	schwer	0,80xD	1,00xD	180°	125	0,014	0,018	0,023	0,027	0,040	0,050	0,060	0,080	0,100	
M1	leicht/mittel	0,80xD	1,00xD	180°	85	0,011	0,014	0,018	0,021	0,028	0,035	0,042	0,056	0,070	
M2	schwer	0,80xD	1,00xD	180°	55	0,011	0,014	0,018	0,021	0,028	0,035	0,042	0,056	0,070	
S	mittel/schwer	0,80xD	1,00xD	180°	45	0,011	0,014	0,018	0,021	0,028	0,035	0,042	0,056	0,070	
	sehr schwer	0,80xD	1,00xD	180°	30	0,009	0,012	0,015	0,018	0,024	0,030	0,036	0,048	0,060	

HPC Schruppen

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø									
						3	4	5	6	8	10	12	16	20	
P1/P2	leicht/mittel	L2	0,20xD	53°	270	0,022	0,029	0,036	0,043	0,070	0,088	0,106	0,141	0,176	
P3	schwer	L2	0,20xD	53°	210	0,022	0,029	0,036	0,043	0,064	0,080	0,096	0,128	0,160	
M1	leicht/mittel	L2	0,15xD	46°	150	0,020	0,027	0,033	0,040	0,053	0,067	0,080	0,106	0,133	
M2	schwer	L2	0,10xD	37°	100	0,024	0,032	0,040	0,048	0,064	0,081	0,097	0,129	0,161	
S	mittel/schwer	L2	0,08xD	31°	90	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175	
	sehr schwer	L2	0,08xD	31°	60	0,023	0,030	0,038	0,045	0,060	0,075	0,090	0,120	0,150	

HSC Schruppen

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø									
						3	4	5	6	8	10	12	16	20	
P1/P2	leicht/mittel	L2	0,15xD	46°	290	0,026	0,034	0,043	0,051	0,084	0,105	0,125	0,167	0,209	
P3	schwer	L2	0,15xD	46°	230	0,026	0,034	0,043	0,051	0,076	0,095	0,114	0,152	0,190	
M1	leicht/mittel	L2	0,10xD	37°	170	0,024	0,032	0,040	0,048	0,064	0,081	0,097	0,129	0,161	
M2	schwer	L2	0,08xD	31°	110	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175	
S	mittel/schwer	L2	0,05xD	26°	100	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175	
	sehr schwer	L2	0,05xD	26°	70	0,023	0,030	0,038	0,045	0,060	0,075	0,090	0,120	0,150	

Schichten

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø									
						3	4	5	6	8	10	12	16	20	
P1/P2	leicht/mittel	L2	0,02xD	18°	320	0,019	0,025	0,032	0,038	0,062	0,077	0,092	0,123	0,154	
P3	schwer	L2	0,02xD	18°	250	0,019	0,025	0,032	0,038	0,056	0,070	0,084	0,112	0,140	
M1	leicht/mittel	L2	0,02xD	18°	170	0,015	0,020	0,025	0,029	0,039	0,049	0,059	0,078	0,098	
M2	schwer	L2	0,01xD	11°	120	0,019	0,025	0,032	0,038	0,050	0,063	0,076	0,101	0,126	
S	mittel/schwer	L2	0,01xD	11°	100	0,019	0,025	0,032	0,038	0,050	0,063	0,076	0,101	0,126	
	sehr schwer	L2	0,01xD	11°	70	0,016	0,022	0,027	0,032	0,043	0,054	0,065	0,086	0,108	

P1	P Bau- und Automatenstähle, unlegierte Vergütungs- und Einsatzstähle	1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6
P2	P Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7
P3	P Legierte Vergütungsstähle, Werkzeug- und Schnellarbeitsstähle	1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6
M1	M Rostfreier Stahl (leicht bearbeitbar/geschwefelt)	1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9
M2	M Rostfreier Stahl (mittelschwer bearbeitbar)	1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2
Ti	T Titan-Legierungen	3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4

SuperF-UT Z SuperF-UT ZS

- Hochleistungs-Schruppen auch bei hohen Schnitttiefen
- hohe Laufruhe und große Zeitspanvolumen
- HPC-Fräsen in zähen, niedrig- und hochlegierten Stählen und schwer zu bearbeitenden Sonderwerkstoffen

SuperF-UT ZS



HPC Schruppen

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø								
						3	4	5	6	8	10	12	16	20
P1/P2	leicht/mittel	L2	0,15xD	46°	280	0,026	0,034	0,043	0,051	0,084	0,105	0,125	0,167	0,209
P3	schwer	L2	0,15xD	46°	220	0,026	0,034	0,043	0,051	0,076	0,095	0,114	0,152	0,190
M1	leicht/mittel	L2	0,10xD	37°	160	0,024	0,032	0,040	0,048	0,064	0,081	0,097	0,129	0,161
M2	schwer	L2	0,10xD	37°	100	0,024	0,032	0,040	0,048	0,064	0,081	0,097	0,129	0,161
S	mittel/schwer	L2	0,08xD	31°	90	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175
	sehr schwer	L2	0,08xD	31°	60	0,023	0,030	0,038	0,045	0,060	0,075	0,090	0,120	0,150

HSC Schruppen

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø								
						3	4	5	6	8	10	12	16	20
P1/P2	leicht/mittel	L2	0,10xD	37°	310	0,031	0,041	0,052	0,062	0,101	0,127	0,152	0,202	0,253
P3	schwer	L2	0,10xD	37°	240	0,031	0,041	0,052	0,062	0,092	0,115	0,138	0,184	0,230
M1	leicht/mittel	L2	0,08xD	31°	170	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175
M2	schwer	L2	0,08xD	31°	110	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175
S	mittel/schwer	L2	0,05xD	26°	100	0,026	0,035	0,044	0,053	0,070	0,088	0,105	0,140	0,175
	sehr schwer	L2	0,05xD	26°	70	0,023	0,030	0,038	0,045	0,060	0,075	0,090	0,120	0,150

Schlichten

Werkstoff	Zerspanbarkeit	a _p max.	a _e max.	max. Eingriffswinkel	v _c	f _z bei Nenn-Ø								
						3	4	5	6	8	10	12	16	20
P1/P2	leicht/mittel	L2	0,01xD	11°	340	0,024	0,032	0,041	0,049	0,079	0,099	0,119	0,158	0,198
P3	schwer	L2	0,01xD	11°	270	0,024	0,032	0,041	0,049	0,072	0,090	0,108	0,144	0,180
M1	leicht/mittel	L2	0,01xD	11°	180	0,019	0,025	0,032	0,038	0,050	0,063	0,076	0,101	0,126
M2	schwer	L2	0,01xD	11°	120	0,019	0,025	0,032	0,038	0,050	0,063	0,076	0,101	0,126
S	mittel/schwer	L2	0,01xD	11°	100	0,019	0,025	0,032	0,038	0,050	0,063	0,076	0,101	0,126
	sehr schwer	L2	0,01xD	11°	70	0,016	0,022	0,027	0,032	0,043	0,054	0,065	0,086	0,108

P1	P Bau- und Automatenstähle, unlegierte Vergütungs- und Einsatzstähle	1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6
P2	P Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle	1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7
P3	P Legierte Vergütungsstähle, Werkzeug- und Schnellarbeitsstähle	1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6
M1	M Rostfreier Stahl (leicht bearbeitbar/geschwefelt)	1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9
M2	M Rostfreier Stahl (mittelschwer bearbeitbar)	1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2
Ti	T Titan-Legierungen	3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4



SuperF-UT ZS-r SuperF-UT ZS-7

- höchste Zerspanleistung bei Trochoidalfräsanwendungen (TC)
- 5 oder 7 Schneiden mit niedrigem Drallwinkel für reduzierte Kontaktpunkte
- bei limitierten Schnittgeschwindigkeiten hohe Vorschübe für herausragendes Zeitspanvolumen

Arbeitsrichtwerte

SuperF-UT NX Micro



Katalog-Nr. 54594

offene Nuten und Helix

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø			v _c	f _z / Ø			v _c	f _z / Ø				
					0,8	1,0	1,2		1,5	1,8	2,0		2,2	2,5	2,8	3,0	
P	Unlegierter Stahl	1,00xD	1,00xD	140	0,0072	0,0090	0,0108	168	0,0135	0,0162	182	0,0180	0,0198	0,0225	196	0,0252	0,0270
	Niedriglegierter Stahl	1,00xD	1,00xD	140	0,0064	0,0080	0,0096	168	0,0120	0,0144	182	0,0160	0,0176	0,0200	196	0,0224	0,0240
	Hochlegierter Stahl und Werkzeugstahl	1,00xD	0,75xD	140	0,0048	0,0060	0,0072	168	0,0090	0,0108	182	0,0120	0,0132	0,0150	196	0,0168	0,0180
M	Nichtrostender Stahl, ferritisch/martensitisch	1,00xD	1,00xD	140	0,0064	0,0080	0,0096	168	0,0120	0,0144	182	0,0160	0,0176	0,0200	196	0,0224	0,0240
	Nichtrostender Stahl, austenitisch	1,00xD	1,00xD	120	0,0056	0,0070	0,0084	144	0,0105	0,0126	156	0,0140	0,0154	0,0175	168	0,0196	0,0210
	Duplexstahl, hochfeste nichtrostende Stähle	1,00xD	0,75xD	90	0,0049	0,0061	0,0073	108	0,0092	0,0110	117	0,0122	0,0135	0,0153	126	0,0171	0,0184
K	Grauguss	1,00xD	1,00xD	120	0,0056	0,0070	0,0084	144	0,0105	0,0126	156	0,0140	0,0154	0,0175	168	0,0196	0,0210
	Gusseisen mit Kugelgraphit	1,00xD	1,00xD	100	0,0050	0,0062	0,0075	120	0,0093	0,0112	130	0,0124	0,0137	0,0156	140	0,0174	0,0187
	Temperguss GJV & ADI	1,00xD	1,00xD	100	0,0050	0,0062	0,0075	120	0,0093	0,0112	130	0,0124	0,0137	0,0156	140	0,0174	0,0187
N	Aluminium-Knetlegierungen	1,00xD	1,00xD	170	0,0096	0,0120	0,0144	204	0,0180	0,0216	221	0,0240	0,0264	0,0300	238	0,0336	0,0360
	Aluminium-Gusslegierungen	1,00xD	1,00xD	125	0,0088	0,0110	0,0133	150	0,0166	0,0199	162,5	0,0221	0,0243	0,0276	175	0,0309	0,0331
	Kupfer und Kupferlegierungen	1,00xD	1,00xD	125	0,0088	0,0110	0,0133	150	0,0166	0,0199	162,5	0,0221	0,0243	0,0276	175	0,0309	0,0331
S	Warmfeste Legierungen, Fe-Basis	1,00xD	0,50xD	100	0,0036	0,0045	0,0054	120	0,0068	0,0081	130	0,0090	0,0099	0,0113	140	0,0126	0,0135
	Warmfeste Legierungen, Ni-Basis, CO-Basis	1,00xD	0,50xD	60	0,0029	0,0037	0,0044	72	0,0055	0,0066	78	0,0073	0,0080	0,0091	84	0,0102	0,0110
	Titanlegierungen & Reintitan	1,00xD	0,75xD	100	0,0060	0,0075	0,0090	120	0,0113	0,0135	130	0,0150	0,0165	0,0188	140	0,0210	0,0225
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	1,00xD	0,25xD	35	0,0032	0,0040	0,0048	42	0,0060	0,0072	46	0,0080	0,0088	0,0100	49	0,0112	0,0120

Rampen und geschlossene Nuten

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø			v _c	f _z / Ø			v _c	f _z / Ø				
					0,8	1,0	1,2		1,5	1,8	2,0		2,2	2,5	2,8	3,0	
P	Unlegierter Stahl	1,00xD	1,00xD	100	0,0043	0,0054	0,0065	120	0,0081	0,0097	130	0,0108	0,0119	0,0135	140	0,0151	0,0162
	Niedriglegierter Stahl	1,00xD	1,00xD	100	0,0038	0,0048	0,0058	120	0,0072	0,0086	130	0,0096	0,0106	0,0120	140	0,0134	0,0144
	Hochlegierter Stahl und Werkzeugstahl	1,00xD	0,75xD	100	0,0029	0,0036	0,0043	120	0,0054	0,0065	130	0,0072	0,0079	0,0090	140	0,0101	0,0108
M	Nichtrostender Stahl, ferritisch/martensitisch	1,00xD	1,00xD	100	0,0038	0,0048	0,0058	120	0,0072	0,0086	130	0,0096	0,0106	0,0120	140	0,0134	0,0144
	Nichtrostender Stahl, austenitisch	1,00xD	1,00xD	90	0,0034	0,0042	0,0050	108	0,0063	0,0076	117	0,0084	0,0092	0,0105	126	0,0118	0,0126
	Duplexstahl, hochfeste nichtrostende Stähle	1,00xD	0,75xD	65	0,0029	0,0037	0,0044	78	0,0055	0,0066	85	0,0073	0,0081	0,0092	91	0,0103	0,0110
K	Grauguss	1,00xD	1,00xD	90	0,0034	0,0042	0,0050	108	0,0063	0,0076	117	0,0084	0,0092	0,0105	126	0,0118	0,0126
	Gusseisen mit Kugelgraphit	1,00xD	1,00xD	75	0,0030	0,0037	0,0045	90	0,0056	0,0067	98	0,0075	0,0082	0,0093	105	0,0105	0,0112
	Temperguss GJV & ADI	1,00xD	1,00xD	75	0,0030	0,0037	0,0045	90	0,0056	0,0067	98	0,0075	0,0082	0,0093	105	0,0105	0,0112
N	Aluminium-Knetlegierungen	1,00xD	1,00xD	120	0,0058	0,0072	0,0086	144	0,0108	0,0130	156	0,0144	0,0158	0,0180	168	0,0202	0,0216
	Aluminium-Gusslegierungen	1,00xD	1,00xD	90	0,0053	0,0066	0,0080	108	0,0099	0,0119	117	0,0133	0,0146	0,0166	126	0,0186	0,0199
	Kupfer und Kupferlegierungen	1,00xD	1,00xD	90	0,0053	0,0066	0,0080	108	0,0099	0,0119	117	0,0133	0,0146	0,0166	126	0,0186	0,0199
S	Warmfeste Legierungen, Fe-Basis	1,00xD	0,50xD	75	0,0022	0,0027	0,0032	90	0,0041	0,0049	98	0,0054	0,0059	0,0068	105	0,0076	0,0081
	Warmfeste Legierungen, Ni-Basis, CO-Basis	1,00xD	0,50xD	45	0,0018	0,0022	0,0026	54	0,0033	0,0039	59	0,0044	0,0048	0,0055	63	0,0061	0,0066
	Titanlegierungen & Reintitan	1,00xD	0,75xD	70	0,0036	0,0045	0,0054	84	0,0068	0,0081	91	0,0090	0,0099	0,0113	98	0,0126	0,0135
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	1,00xD	0,25xD	25	0,0019	0,0024	0,0029	30	0,0036	0,0043	33	0,0048	0,0053	0,0060	35	0,0067	0,0072

Schuppen

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø			v _c	f _z / Ø			v _c	f _z / Ø				
					0,8	1,0	1,2		1,5	1,8	2,0		2,2	2,5	2,8	3,0	
P	Unlegierter Stahl	0,25xD	2,00xD	170	0,0113	0,0142	0,0170	204	0,0213	0,0255	221	0,0284	0,0312	0,0354	238	0,0397	0,0425
	Niedriglegierter Stahl	0,25xD	2,00xD	170	0,0101	0,0126	0,0151	204	0,0189	0,0227	221	0,0252	0,0277	0,0315	238	0,0353	0,0378
	Hochlegierter Stahl und Werkzeugstahl	0,20xD	2,00xD	170	0,0076	0,0095	0,0113	204	0,0142	0,0170	221	0,0189	0,0208	0,0236	238	0,0265	0,0284
M	Nichtrostender Stahl, ferritisch/martensitisch	0,25xD	2,00xD	170	0,0101	0,0126	0,0151	204	0,0189	0,0227	221	0,0252	0,0277	0,0315	238	0,0353	0,0378
	Nichtrostender Stahl, austenitisch	0,20xD	2,00xD	145	0,0088	0,0110	0,0132	174	0,0165	0,0198	189	0,0221	0,0243	0,0276	203	0,0309	0,0331
	Duplexstahl, hochfeste nichtrostende Stähle	0,20xD	2,00xD	105	0,0077	0,0096	0,0116	126	0,0145	0,0174	137	0,0193	0,0212	0,0241	147	0,0270	0,0289
K	Grauguss	0,25xD	2,00xD	145	0,0088	0,0110	0,0132	174	0,0165	0,0198	189	0,0221	0,0243	0,0276	203	0,0309	0,0331
	Gusseisen mit Kugelgraphit	0,25xD	2,00xD	120	0,0078	0,0098	0,0118	144	0,0147	0,0176	156	0,0196	0,0216	0,0245	168	0,0274	0,0294
	Temperguss GJV & ADI	0,25xD	2,00xD	120	0,0078	0,0098	0,0118	144	0,0147	0,0176	156	0,0196	0,0216	0,0245	168	0,0274	0,0294
N	Aluminium-Knetlegierungen	0,25xD	2,00xD	200	0,0151	0,0189	0,0227	240	0,0284	0,0340	260	0,0378	0,0416	0,0473	280	0,0529	0,0567
	Aluminium-Gusslegierungen	0,25xD	2,00xD	150	0,0139	0,0174	0,0209	180	0,0261	0,0313	195	0,0348	0,0383	0,0435	210	0,0487	0,0522
	Kupfer und Kupferlegierungen	0,25xD	2,00xD	150	0,0139	0,0174	0,0209	180	0,0261	0,0313	195	0,0348	0,0383	0,0435	210	0,0487	0,0522
S	Warmfeste Legierungen, Fe-Basis	0,15xD	2,00xD	120	0,0057	0,0071	0,0085	144	0,0106	0,0128	156	0,0142	0,0156	0,0177	168	0,0198	0,0213
	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,15xD	2,00xD	70	0,0046	0,0058	0,0069	84	0,0086	0,0104	91	0,0115	0,0127	0,0144	98	0,0161	0,0173
	Titanlegierungen & Reintitan	0,20xD	2,00xD	115	0,0095	0,0118	0,0142	138	0,0177	0,0213	150	0,0236	0,0260	0,0295	161	0,0331	0,0354
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	0,05xD	2,00xD	45	0,0050	0,0063	0,0076	54	0,0095	0,0113	59	0,0126	0,0139	0,0158	63	0,0176	0,0189

Schlichten

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø			f _z / Ø			f _z / Ø			f _z / Ø			
					0,8	1,0	1,2	v _c	1,5	1,8	v _c	2,0	2,2	2,5	v _c	2,8	3,0
	Unlegierter Stahl	0,03xD	2,00xD	180	0,0086	0,0108	0,0130	216	0,0162	0,0194	234	0,0216	0,0238	0,0270	252	0,0302	0,0324
P	Niedriglegierter Stahl	0,03xD	2,00xD	180	0,0077	0,0096	0,0115	216	0,0144	0,0173	234	0,0192	0,0211	0,0240	252	0,0269	0,0288
	Hochlegierter Stahl und Werkzeugstahl	0,03xD	2,00xD	180	0,0058	0,0072	0,0086	216	0,0108	0,0130	234	0,0144	0,0158	0,0180	252	0,0202	0,0216
	Nichtrostender Stahl, ferritisch/martensitisch	0,03xD	2,00xD	180	0,0077	0,0096	0,0115	216	0,0144	0,0173	234	0,0192	0,0211	0,0240	252	0,0269	0,0288
M	Nichtrostender Stahl, austenitisch	0,03xD	2,00xD	155	0,0067	0,0084	0,0101	186	0,0126	0,0151	202	0,0168	0,0185	0,0210	217	0,0235	0,0252
	Duplexstahl, hochfeste nichtrostende Stähle	0,03xD	2,00xD	115	0,0059	0,0073	0,0088	138	0,0110	0,0132	150	0,0147	0,0162	0,0184	161	0,0206	0,0220
	Grauguss	0,03xD	2,00xD	155	0,0067	0,0084	0,0101	186	0,0126	0,0151	202	0,0168	0,0185	0,0210	217	0,0235	0,0252
K	Gusseisen mit Kugelgraphit																
	Temperguss																
	GJV & ADI	0,03xD	2,00xD	130	0,0060	0,0075	0,0090	156	0,0112	0,0134	169	0,0149	0,0164	0,0187	182	0,0209	0,0224
	Aluminium-Knetlegierungen	0,03xD	2,00xD	220	0,0115	0,0144	0,0173	264	0,0216	0,0259	286	0,0288	0,0317	0,0360	308	0,0403	0,0432
N	Aluminium-Gusslegierungen																
	Kupfer und Kupferlegierungen	0,03xD	2,00xD	160	0,0106	0,0133	0,0159	192	0,0199	0,0239	208	0,0265	0,0292	0,0331	224	0,0371	0,0398
	Warmfeste Legierungen, Fe-Basis	0,03xD	2,00xD	130	0,0043	0,0054	0,0065	156	0,0081	0,0097	169	0,0108	0,0119	0,0135	182	0,0151	0,0162
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,03xD	2,00xD	75	0,0035	0,0044	0,0053	90	0,0066	0,0079	98	0,0088	0,0096	0,0110	105	0,0123	0,0132
	Titanlegierungen & Reintitan	0,03xD	2,00xD	120	0,0072	0,0090	0,0108	144	0,0135	0,0162	156	0,0180	0,0198	0,0225	168	0,0252	0,0270
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	0,02xD	2,00xD	45	0,0038	0,0048	0,0058	54	0,0072	0,0086	59	0,0096	0,0106	0,0120	63	0,0134	0,0144

Bohren

	Material/ISO-Werkstoff	a _p max.	v _c	f _z / Ø			f _z / Ø			f _z / Ø			f _z / Ø			
				0,8	1,0	1,2	v _c	1,5	1,8	v _c	2,0	2,2	2,5	v _c	2,8	3,0
	Unlegierter Stahl	1,00xD	100	0,0014	0,0018	0,0022	120	0,0027	0,0032	130	0,0036	0,0040	0,0045	140	0,0050	0,0054
P	Niedriglegierter Stahl	1,00xD	100	0,0013	0,0016	0,0019	120	0,0024	0,0029	130	0,0032	0,0035	0,0040	140	0,0045	0,0048
	Hochlegierter Stahl und Werkzeugstahl	0,50xD	90	0,0010	0,0012	0,0014	108	0,0018	0,0022	117	0,0024	0,0026	0,0030	126	0,0034	0,0036
	Nichtrostender Stahl, ferritisch/martensitisch	0,75xD	90	0,0012	0,0015	0,0018	108	0,0023	0,0027	117	0,0030	0,0033	0,0038	126	0,0042	0,0045
M	Nichtrostender Stahl, austenitisch	0,50xD	85	0,0011	0,0014	0,0017	102	0,0021	0,0025	111	0,0028	0,0031	0,0035	119	0,0039	0,0042
	Duplexstahl, hochfeste nichtrostende Stähle	0,25xD	65	0,0010	0,0012	0,0014	78	0,0018	0,0022	85	0,0024	0,0026	0,0030	91	0,0034	0,0036
	Grauguss	1,00xD	90	0,0011	0,0014	0,0017	108	0,0021	0,0025	117	0,0028	0,0031	0,0035	126	0,0039	0,0042
K	Gusseisen mit Kugelgraphit															
	Temperguss															
	GJV & ADI	1,00xD	75	0,0010	0,0012	0,0014	90	0,0018	0,0022	98	0,0024	0,0026	0,0030	105	0,0034	0,0036
	Aluminium-Knetlegierungen	0,50xD	125	0,0019	0,0024	0,0029	150	0,0036	0,0043	163	0,0048	0,0053	0,0060	175	0,0067	0,0072
N	Aluminium-Gusslegierungen															
	Kupfer und Kupferlegierungen	0,50xD	90	0,0018	0,0022	0,0026	108	0,0033	0,0040	117	0,0044	0,0048	0,0055	126	0,0062	0,0066
	Warmfeste Legierungen, Fe-Basis	0,25xD	75	0,0007	0,0009	0,0011	90	0,0014	0,0016	98	0,0018	0,0020	0,0023	105	0,0025	0,0027
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,25xD	45	0,0006	0,0008	0,0009	54	0,0011	0,0014	59	0,0015	0,0017	0,0019	63	0,0021	0,0023
	Titanlegierungen & Reintitan	0,25xD	70	0,0012	0,0015	0,0018	84	0,0023	0,0027	91	0,0030	0,0033	0,0038	98	0,0042	0,0045

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	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø	
					1,0	1,2		1,5	2,0		2,5	2,8		3,0	
	Unlegierter Stahl	1,00xD	0,50xD	112	0,0081	0,0097	134	0,0122	146	0,0162	0,0203	157	0,0227	0,0243	
P	Niedriglegierter Stahl	1,00xD	0,50xD	112	0,0072	0,0086	134	0,0108	146	0,0144	0,0180	157	0,0202	0,0216	
	Hochlegierter Stahl und Werkzeugstahl	1,00xD	0,25xD	112	0,0054	0,0065	134	0,0081	146	0,0108	0,0135	157	0,0151	0,0162	
	Nichtrostender Stahl, ferritisch/martensitisch	1,00xD	0,25xD	112	0,0072	0,0086	134	0,0108	146	0,0144	0,0180	157	0,0202	0,0216	
M	Nichtrostender Stahl, austenitisch	1,00xD	0,25xD	96	0,0063	0,0076	115	0,0095	125	0,0126	0,0158	134	0,0176	0,0189	
	Duplexstahl, hochfeste nichtrostende Stähle	1,00xD	0,25xD	71	0,0055	0,0066	85	0,0083	92	0,0110	0,0138	99	0,0154	0,0165	
	Grauguss	1,00xD	0,50xD	96	0,0063	0,0076	115	0,0095	125	0,0126	0,0158	134	0,0176	0,0189	
K	Gusseisen mit Kugelgraphit	1,00xD	0,50xD	80	0,0056	0,0067	96	0,0084	104	0,0112	0,0140	112	0,0157	0,0168	
	Temperguss	1,00xD	0,50xD	80	0,0056	0,0067	96	0,0084	104	0,0112	0,0140	112	0,0157	0,0168	
	GJV & ADI	1,00xD	0,50xD	80	0,0056	0,0067	96	0,0084	104	0,0112	0,0140	112	0,0157	0,0168	
	Aluminium-Knetlegierungen	1,00xD	0,50xD	136	0,0108	0,0130	163	0,0162	177	0,0216	0,0270	190	0,0302	0,0324	
N	Aluminium-Gusslegierungen	1,00xD	0,50xD	100	0,0099	0,0119	120	0,0149	130	0,0199	0,0249	140	0,0278	0,0298	
	Kupfer und Kupferlegierungen	1,00xD	0,50xD	100	0,0099	0,0119	120	0,0149	130	0,0199	0,0249	140	0,0278	0,0298	
	Warmfeste Legierungen, Fe-Basis	1,00xD	0,25xD	80	0,0041	0,0049	96	0,0061	104	0,0081	0,0101	112	0,0113	0,0122	
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	1,00xD	0,25xD	46	0,0033	0,0039	55	0,0049	60	0,0066	0,0082	64	0,0092	0,0099	
	Titanlegierungen & Reintitan	1,00xD	0,25xD	72	0,0068	0,0081	86	0,0101	94	0,0135	0,0169	101	0,0189	0,0203	
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	1,00xD	0,10xD	26	0,0036	0,0043	31	0,0054	34	0,0072	0,0090	36	0,0101	0,0108	

Rampen und geschlossene Nuten

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø	
					1,0	1,2		1,5	2,0		2,5	2,8		3,0	
	Unlegierter Stahl	1,00xD	0,50xD	78	0,0049	0,0058	94	0,0073	102	0,0097	0,0122	110	0,0136	0,0146	
P	Niedriglegierter Stahl	1,00xD	0,50xD	78	0,0043	0,0052	94	0,0065	102	0,0086	0,0108	110	0,0121	0,0130	
	Hochlegierter Stahl und Werkzeugstahl	1,00xD	0,25xD	78	0,0032	0,0039	94	0,0049	102	0,0065	0,0081	110	0,0091	0,0097	
	Nichtrostender Stahl, ferritisch/martensitisch	1,00xD	0,25xD	78	0,0043	0,0052	94	0,0065	102	0,0086	0,0108	110	0,0121	0,0130	
M	Nichtrostender Stahl, austenitisch	1,00xD	0,25xD	67	0,0038	0,0045	81	0,0057	87	0,0076	0,0095	94	0,0106	0,0113	
	Duplexstahl, hochfeste nichtrostende Stähle	1,00xD	0,25xD	50	0,0033	0,0040	60	0,0050	65	0,0066	0,0083	70	0,0093	0,0099	
	Grauguss	1,00xD	0,50xD	67	0,0038	0,0045	81	0,0057	87	0,0076	0,0095	94	0,0106	0,0113	
K	Gusseisen mit Kugelgraphit	1,00xD	0,50xD	56	0,0034	0,0040	67	0,0050	73	0,0067	0,0084	78	0,0094	0,0101	
	Temperguss	1,00xD	0,50xD	56	0,0034	0,0040	67	0,0050	73	0,0067	0,0084	78	0,0094	0,0101	
	GJV & ADI	1,00xD	0,50xD	56	0,0034	0,0040	67	0,0050	73	0,0067	0,0084	78	0,0094	0,0101	
	Aluminium-Knetlegierungen	1,00xD	0,50xD	95	0,0065	0,0078	114	0,0097	124	0,0130	0,0162	133	0,0181	0,0194	
N	Aluminium-Gusslegierungen	1,00xD	0,50xD	70	0,0060	0,0072	84	0,0089	91	0,0119	0,0149	98	0,0167	0,0179	
	Kupfer und Kupferlegierungen	1,00xD	0,50xD	70	0,0060	0,0072	84	0,0089	91	0,0119	0,0149	98	0,0167	0,0179	
	Warmfeste Legierungen, Fe-Basis	1,00xD	0,25xD	56	0,0024	0,0029	67	0,0036	73	0,0049	0,0061	78	0,0068	0,0073	
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	1,00xD	0,25xD	32	0,0020	0,0024	39	0,0030	42	0,0039	0,0049	45	0,0055	0,0059	
	Titanlegierungen & Reintitan	1,00xD	0,25xD	50	0,0041	0,0049	60	0,0061	66	0,0081	0,0101	71	0,0113	0,0122	
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	1,00xD	0,10xD	18	0,0022	0,0026	22	0,0032	24	0,0043	0,0054	25	0,0060	0,0065	

Schruppen

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø		v _c	f _z / Ø	
					1,0	1,2		1,5	2,0		2,5	2,8		3,0	
	Unlegierter Stahl	0,10xD	5,00xD	134	0,0128	0,0153	161	0,0191	174	0,0255	0,0319	188	0,0357	0,0383	
P	Niedriglegierter Stahl	0,10xD	5,00xD	134	0,0113	0,0136	161	0,0170	174	0,0227	0,0284	188	0,0318	0,0340	
	Hochlegierter Stahl und Werkzeugstahl	0,08xD	5,00xD	134	0,0085	0,0102	161	0,0128	174	0,0170	0,0213	188	0,0238	0,0255	
	Nichtrostender Stahl, ferritisch/martensitisch	0,10xD	5,00xD	134	0,0113	0,0136	161	0,0170	174	0,0227	0,0284	188	0,0318	0,0340	
M	Nichtrostender Stahl, austenitisch	0,08xD	5,00xD	115	0,0099	0,0119	138	0,0149	150	0,0198	0,0248	161	0,0278	0,0298	
	Duplexstahl, hochfeste nichtrostende Stähle	0,05xD	5,00xD	86	0,0087	0,0104	103	0,0130	112	0,0174	0,0217	120	0,0243	0,0260	
	Grauguss	0,10xD	5,00xD	115	0,0099	0,0119	138	0,0149	150	0,0198	0,0248	161	0,0278	0,0298	
K	Gusseisen mit Kugelgraphit	0,10xD	5,00xD	96	0,0088	0,0106	115	0,0132	125	0,0176	0,0220	134	0,0247	0,0265	
	Temperguss	0,10xD	5,00xD	96	0,0088	0,0106	115	0,0132	125	0,0176	0,0220	134	0,0247	0,0265	
	GJV & ADI	0,10xD	5,00xD	96	0,0088	0,0106	115	0,0132	125	0,0176	0,0220	134	0,0247	0,0265	
	Aluminium-Knetlegierungen	0,15xD	5,00xD	163	0,0170	0,0204	196	0,0255	212	0,0340	0,0425	228	0,0476	0,0510	
N	Aluminium-Gusslegierungen	0,12xD	5,00xD	120	0,0157	0,0188	144	0,0235	156	0,0313	0,0392	168	0,0438	0,0470	
	Kupfer und Kupferlegierungen	0,12xD	5,00xD	120	0,0157	0,0188	144	0,0235	156	0,0313	0,0392	168	0,0438	0,0470	
	Warmfeste Legierungen, Fe-Basis	0,08xD	5,00xD	96	0,0064	0,0077	115	0,0096	125	0,0128	0,0159	134	0,0179	0,0191	
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,05xD	5,00xD	55	0,0052	0,0062	66	0,0078	72	0,0104	0,0130	77	0,0145	0,0155	
	Titanlegierungen & Reintitan	0,08xD	5,00xD	86	0,0106	0,0128	103	0,0159	112	0,0213	0,0266	120	0,0298	0,0319	
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	0,03xD	5,00xD	31	0,0057	0,0068	37	0,0085	40	0,0113	0,0142	43	0,0159	0,0170	

Schlichten

	Material/ISO-Werkstoff	a _e max.	a _p max.	v _c	f _z / Ø		f _z / Ø		f _z / Ø		f _z / Ø			
					1,0	1,2	v _c	1,5	v _c	2,0	2,5	v _c	2,8	3,0
	Unlegierter Stahl	0,02xD	5,00xD	146	0,0097	0,0117	175	0,0146	190	0,0194	0,0243	204	0,0272	0,0292
P	Niedriglegierter Stahl	0,02xD	5,00xD	146	0,0086	0,0104	175	0,0130	190	0,0173	0,0216	204	0,0242	0,0259
	Hochlegierter Stahl und Werkzeugstahl	0,02xD	5,00xD	146	0,0065	0,0078	175	0,0097	190	0,0130	0,0162	204	0,0181	0,0194
	Nichtrostender Stahl, ferritisch/martensitisch	0,02xD	5,00xD	146	0,0086	0,0104	175	0,0130	190	0,0173	0,0216	204	0,0242	0,0259
M	Nichtrostender Stahl, austenitisch	0,02xD	5,00xD	125	0,0076	0,0091	150	0,0113	163	0,0151	0,0189	175	0,0212	0,0227
	Duplexstahl, hochfeste nichtrostende Stähle	0,02xD	5,00xD	93	0,0066	0,0079	112	0,0099	121	0,0132	0,0165	130	0,0185	0,0198
	Grauguss	0,02xD	5,00xD	125	0,0076	0,0091	150	0,0113	163	0,0151	0,0189	175	0,0212	0,0227
K	Gusseisen mit Kugelgraphit													
	Temperguss	0,02xD	5,00xD	104	0,0067	0,0081	125	0,0101	135	0,0134	0,0168	146	0,0188	0,0202
	GJV & ADI													
	Aluminium-Knetlegierungen	0,02xD	5,00xD	177	0,0130	0,0156	212	0,0194	230	0,0259	0,0324	248	0,0363	0,0389
N	Aluminium-Gusslegierungen													
	Kupfer und Kupferlegierungen	0,02xD	5,00xD	130	0,0119	0,0143	156	0,0179	169	0,0239	0,0298	182	0,0334	0,0358
	Warmfeste Legierungen, Fe-Basis	0,02xD	5,00xD	104	0,0049	0,0058	125	0,0073	135	0,0097	0,0122	146	0,0136	0,0146
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,02xD	5,00xD	60	0,0039	0,0047	72	0,0059	78	0,0079	0,0099	84	0,0111	0,0118
	Titanlegierungen & Reintitan	0,02xD	5,00xD	94	0,0081	0,0097	113	0,0122	122	0,0162	0,0203	132	0,0227	0,0243
H	Gehärteter Stahl, gehärtet und angelassen, < 55 HRC	0,01xD	5,00xD	34	0,0043	0,0052	41	0,0065	44	0,0086	0,0108	48	0,0121	0,0130

Bohren

	Material/ISO-Werkstoff	a _e max.	v _c	f _z / Ø		f _z / Ø		f _z / Ø		f _z / Ø			
				1,0	1,2	v _c	1,5	v _c	2,0	2,5	v _c	2,8	3,0
	Unlegierter Stahl	0,50xD	84	0,0097	0,0117	175	0,0146	190	0,0194	0,0243	204	0,0272	0,0292
P	Niedriglegierter Stahl	0,50xD	84	0,0013	0,0015	101	0,0019	109	0,0026	0,0032	118	0,0036	0,0038
	Hochlegierter Stahl und Werkzeugstahl	0,25xD	84	0,0010	0,0012	101	0,0014	109	0,0019	0,0024	118	0,0027	0,0029
	Nichtrostender Stahl, ferritisch/martensitisch	0,25xD	84	0,0013	0,0015	101	0,0019	109	0,0026	0,0032	118	0,0036	0,0038
M	Nichtrostender Stahl, austenitisch	0,25xD	72	0,0011	0,0013	86	0,0017	94	0,0022	0,0028	101	0,0031	0,0034
	Duplexstahl, hochfeste nichtrostende Stähle	0,25xD	54	0,0010	0,0012	65	0,0015	70	0,0020	0,0024	76	0,0027	0,0029
	Grauguss	0,50xD	72	0,0011	0,0013	86	0,0017	94	0,0022	0,0028	101	0,0031	0,0034
K	Gusseisen mit Kugelgraphit												
	Temperguss	0,50xD	60	0,0010	0,0012	72	0,0015	78	0,0020	0,0025	84	0,0028	0,0030
	GJV & ADI												
	Aluminium-Knetlegierungen	0,50xD	102	0,0019	0,0023	122	0,0029	133	0,0038	0,0048	143	0,0054	0,0058
N	Aluminium-Gusslegierungen												
	Kupfer und Kupferlegierungen	0,50xD	75	0,0018	0,0021	90	0,0027	97,5	0,0035	0,0044	105	0,0049	0,0053
	Warmfeste Legierungen, Fe-Basis	0,25xD	60	0,0007	0,0009	72	0,0011	78	0,0014	0,0018	84	0,0020	0,0022
S	Warmfeste Legierungen, Ni-Basis, CO-Basis	0,25xD	34	0,0006	0,0007	41	0,0009	44	0,0012	0,0015	48	0,0016	0,0018
	Titanlegierungen & Reintitan	0,25xD	54	0,0012	0,0014	65	0,0018	70	0,0024	0,0030	76	0,0034	0,0036

SuperF-UT NX



Nuten

Werkstoff	Härte	a _p max.	a _e max.	v _c	f _z bei Nenn-Ø							
					4	5	6	8	10	12	16	20
P1	≤ 850 N/mm ²	1xD	1xD	270	0,017	0,021	0,025	0,034	0,050	0,060	0,080	0,100
P2	850-1200 N/mm ²	1xD	1xD	230	0,017	0,021	0,025	0,034	0,050	0,060	0,080	0,100
P3	850-1400 N/mm ²	1xD	1xD	180	0,014	0,018	0,021	0,028	0,045	0,054	0,072	0,090
M1	≤ 750 N/mm ²	1xD	1xD	120	0,014	0,018	0,021	0,028	0,045	0,054	0,072	0,090
M2	750-950 N/mm ²	1xD	1xD	80	0,013	0,016	0,019	0,026	0,040	0,048	0,064	0,080
K2	≥ 240 HB	1xD	1xD	150	0,017	0,021	0,025	0,034	0,050	0,060	0,080	0,100
N1	≤ 7 % Si	1xD	1xD	500	0,022	0,028	0,033	0,044	0,065	0,078	0,104	0,130
N2	≥ 7 % Si	1xD	1xD	340	0,018	0,023	0,027	0,036	0,055	0,066	0,088	0,110
Ti	≤ 1300 N/mm ²	1xD	1xD	60	0,013	0,016	0,019	0,026	0,040	0,048	0,064	0,080

HPC Schruppen

Werkstoff	Härte	a _p max.	a _e max.	v _c	f _z bei Nenn-Ø							
					4	5	6	8	10	12	16	20
P1	≤ 850 N/mm ²	1,5xD	0,40xD	350	0,021	0,026	0,032	0,042	0,063	0,075	0,100	0,125
P2	850-1200 N/mm ²	1,5xD	0,40xD	290	0,021	0,026	0,032	0,042	0,063	0,075	0,100	0,125
P3	850-1400 N/mm ²	1,5xD	0,33xD	260	0,018	0,023	0,027	0,036	0,059	0,070	0,094	0,117
M1	≤ 750 N/mm ²	1,5xD	0,33xD	160	0,018	0,023	0,027	0,036	0,059	0,070	0,094	0,117
M2	750-950 N/mm ²	1,5xD	0,25xD	120	0,019	0,024	0,029	0,038	0,060	0,072	0,096	0,120
K2	≥ 240 HB	1,5xD	0,40xD	190	0,021	0,026	0,032	0,042	0,063	0,075	0,100	0,125
N1	≤ 7 % Si	1,5xD	0,40xD	600	0,028	0,034	0,041	0,055	0,081	0,098	0,130	0,163
N2	≥ 7 % Si	1,5xD	0,40xD	440	0,023	0,028	0,034	0,045	0,069	0,083	0,110	0,138
Ti	≤ 1300 N/mm ²	1,5xD	0,33xD	110	0,017	0,021	0,025	0,033	0,052	0,062	0,083	0,104

HSC Schlichten

Werkstoff	Härte	a _p max.	a _e max.	v _c	f _z bei Nenn-Ø							
					4	5	6	8	10	12	16	20
P1	≤ 850 N/mm ²	2xD	0,02xD	540	0,018	0,023	0,028	0,037	0,055	0,066	0,088	0,110
P2	850-1200 N/mm ²	2xD	0,02xD	460	0,018	0,023	0,028	0,037	0,055	0,066	0,088	0,110
P3	850-1400 N/mm ²	2xD	0,02xD	350	0,015	0,019	0,023	0,031	0,050	0,059	0,079	0,099
M1	≤ 750 N/mm ²	2xD	0,02xD	220	0,015	0,019	0,023	0,031	0,050	0,059	0,079	0,099
M2	750-950 N/mm ²	2xD	0,02xD	160	0,014	0,018	0,021	0,028	0,044	0,053	0,070	0,088
K2	≥ 240 HB	2xD	0,02xD	300	0,018	0,023	0,028	0,037	0,055	0,066	0,088	0,110
N1	≤ 7 % Si	2xD	0,02xD	1000	0,024	0,030	0,036	0,048	0,072	0,086	0,114	0,143
N2	≥ 7 % Si	2xD	0,02xD	680	0,020	0,025	0,030	0,040	0,061	0,073	0,097	0,121
Ti	≤ 1300 N/mm ²	2xD	0,02xD	130	0,014	0,018	0,021	0,028	0,044	0,053	0,070	0,088

Rampen, Helix, Stechen

Werkstoff	Härte	Rampftiefe (a _p)	max. Rampwinkel	v _c	f _z bei Nenn-Ø							
					4	5	6	8	10	12	16	20
P1	≤ 850 N/mm ²	1xD	45°	270	0,015	0,019	0,023	0,030	0,045	0,054	0,072	0,090
P2	850-1200 N/mm ²	1xD	45°	230	0,013	0,017	0,020	0,026	0,040	0,048	0,064	0,080
P3	850-1400 N/mm ²	1xD	30°	180	0,011	0,014	0,017	0,022	0,030	0,036	0,048	0,060
M1	≤ 750 N/mm ²	1xD	10°	120	0,009	0,012	0,014	0,018	0,030	0,036	0,048	0,060
M2	750-950 N/mm ²	1xD	5°	80	0,007	0,009	0,011	0,014	0,025	0,030	0,040	0,050
K2	≥ 240 HB	1xD	45°	150	0,015	0,019	0,023	0,030	0,045	0,054	0,072	0,090
N1	≤ 7 % Si	1xD	30°	500	0,013	0,017	0,020	0,026	0,040	0,048	0,064	0,080
N2	≥ 7 % Si	1xD	45°	340	0,015	0,019	0,023	0,030	0,045	0,054	0,072	0,090
Ti	≤ 1300 N/mm ²	1xD	10°	60	0,007	0,009	0,011	0,014	0,025	0,030	0,040	0,050

Bohren

Werkstoff	Härte	max. Bohrtiefe ohne Entspannen	v _c	f _z bei Nenn-Ø							
				4	5	6	8	10	12	16	20
P1	≤ 850 N/mm ²	1,5xD	270	0,014	0,018	0,021	0,028	0,040	0,048	0,064	0,080
P2	850-1200 N/mm ²	1,5xD	230	0,012	0,015	0,018	0,024	0,035	0,042	0,056	0,070
P3	850-1400 N/mm ²	1,0xD	180	0,008	0,010	0,012	0,016	0,025	0,030	0,040	0,050
K2	≥ 240 HB	1,5xD	150	0,014	0,018	0,021	0,028	0,040	0,048	0,064	0,080
N1	≤ 7 % Si	1,0xD	500	0,012	0,015	0,018	0,024	0,035	0,042	0,056	0,070
N2	≥ 7 % Si	1,0xD	340	0,014	0,018	0,021	0,028	0,040	0,048	0,064	0,080

P1	P Bau- und Automatenstähle, unlegierte Vergütungs- und Einsatzstähle		1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6
P2	P Automatenstähle, unlegierte Einsatzstähle, Nitrierstähle		1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAINi7
P3	P Legierte Vergütungsstähle, Werkzeug- und Schnellarbeitsstähle		1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6
M1	M Rostfreier Stahl (leicht bearbeitbar/geschwefelt)		1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9
M2	M Rostfreier Stahl (mittelschwer bearbeitbar)		1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2
K2	K Gusseisen, Grauguss, Temperguss und Kugelgraphitguss		0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)
N1	N Aluminium, Alu-Knetlegierungen, Alulegierungen		3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si
N2	N Aluminium-Gusslegierungen		3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9
Ti	T Titan-Legierungen		3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4

Frässtrategien

Eintauchen – spezielle Werkzeuge mit Tauchgeometrie

SuperF-UT NX

- h10 Schneidentoleranz
- 36°/37°/38° Drall
- Unter- & Glattmaßdurchmesser
- gute Bohreigenschaften
- sehr gute Fräseigenschaften

Erste Wahl: Fräsen und Tauchen



Pilotfräser Art.-Nr. 54700

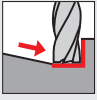
- m8 Schneidentoleranz
- 30° Drall
- sehr viele Einzelabmessungen
- sehr gute Bohreigenschaften
- ausreichende Fräseigenschaften

Erste Wahl: Bohren und Pilotieren



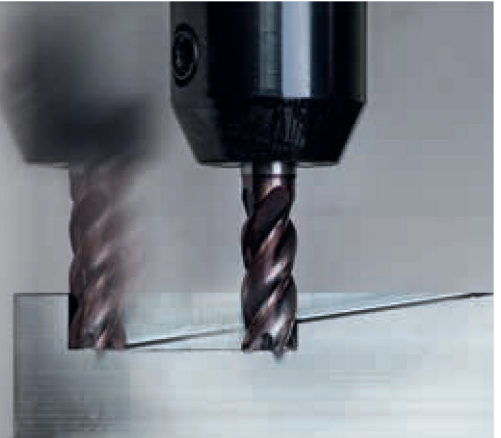
Frässtrategien

Eintauchen – spezielle Werkzeuge mit Tauchgeometrie



Rampen

- Rampenwinkel = 15° - 45° bis max. a_p $1 \times D$
- f_z **100 %**



Helix

- Zustellung = $0,10$ - $0,30 \times D$ pro Umdrehung
- kleinster zu erzeugender Durchmesser = $1,7 \times D$
- f_z **100 %**



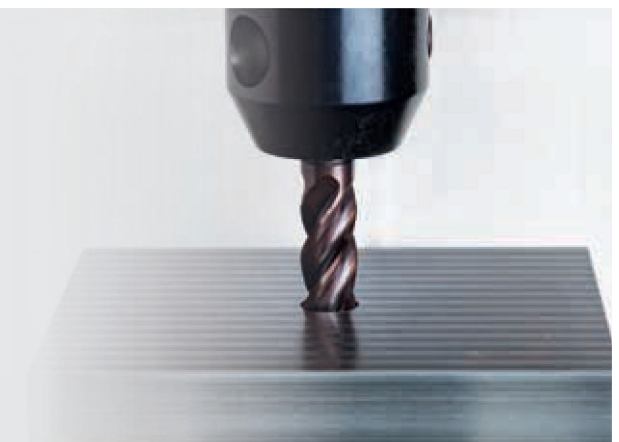
Stechen

- Alternative bei Problemen durch zu hohe Radialkräfte
- a_e $0,25 \times D$ - a_p Schneidlänge/ Freischlifflänge
- f_z **100 %**



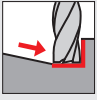
Bohren/Pilotieren

- max. Tiefenzustellung $1 \times D$ dann entspannen
- f_z **100 %**



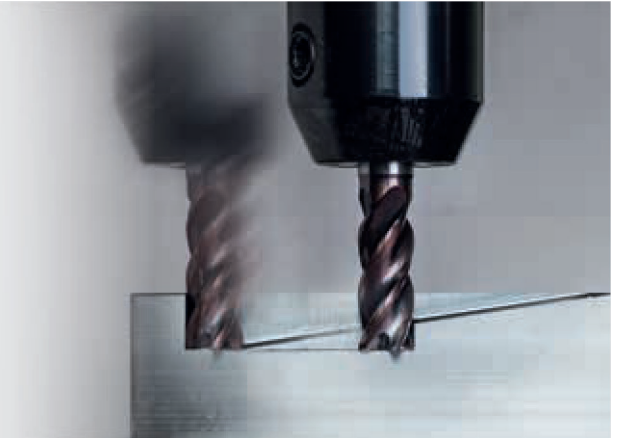
Frässtrategien

Eintauchen – allgemein mit Standard-Stirngeometrien



Rampen

- Rampenwinkel = 2° - 5° bis max. a_p $1 \times D$
- gleichmäßiger Lastanstieg
- f_z **75 %**



Helix

- Zustellung = $0,05$ - $0,15 \times D$ pro Umdrehung
- kleinster zu erzeugender Durchmesser = $1,7 \times D$
- f_z **100 %**



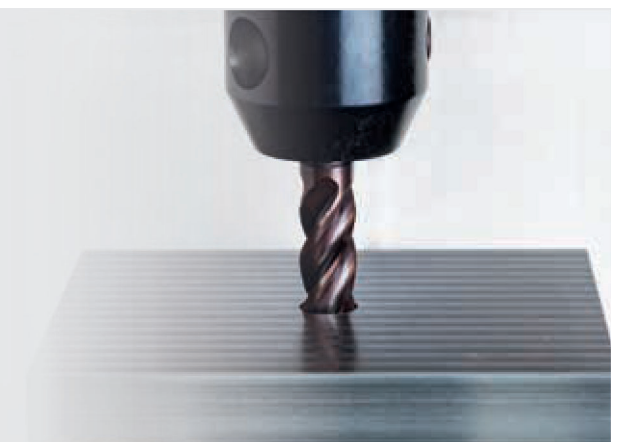
Stechen

- Alternative bei Problemen durch zu hohe Radialkräfte
- a_e $0,25 \times D$ - a_p Schneidlänge / Freischlifflänge
- f_z **100 %**



Bohren/Pilotieren

- max. Tiefenzustellung $0,5 \times D$ dann entspannen
- f_z **50 %**



Basis $f_z = f_z$ Nuten

Fasfräser / Vor- und Rückwärtssenker



Anfasen max. a_p/a_e 0,25xD



Werkstoff	Härte	a_p max.	a_e max.	v_c	f_z bei Nenn-Ø						
					3	6	8	10	12	16	20
P	$\leq 850 \text{ N/mm}^2$	0,25xD	0,25xD	192	0,018	0,036	0,048	0,060	0,080	0,100	0,130
	$\geq 850 \text{ N/mm}^2$	0,25xD	0,25xD	140	0,016	0,032	0,042	0,060	0,070	0,090	0,120
M	$\leq 750 \text{ N/mm}^2$	0,25xD	0,25xD	120	0,013	0,025	0,034	0,050	0,050	0,070	0,090
	$\geq 750 \text{ N/mm}^2$	0,25xD	0,25xD	80	0,009	0,019	0,025	0,040	0,040	0,060	0,070
K	$\leq 240 \text{ HB}$	0,25xD	0,25xD	170	0,017	0,033	0,044	0,060	0,070	0,090	0,120
	$\geq 240 \text{ HB}$	0,25xD	0,25xD	150	0,014	0,028	0,037	0,050	0,060	0,080	0,100
N	$\geq 7 \% \text{ Si}$	0,25xD	0,25xD	250	0,023	0,047	0,062	0,080	0,100	0,130	0,170
H	$\leq 55 \text{ HRC}$	0,25xD	0,25xD	50	0,010	0,020	0,026	0,040	0,050	0,060	0,070
S	Ti-Basis	0,25xD	0,25xD	50	0,010	0,020	0,027	0,036	0,043	0,060	0,070
	Ni-Basis	0,25xD	0,25xD	40	0,005	0,011	0,014	0,022	0,026	0,030	0,040

Entgraten max. a_p/a_e 0,05xD



Werkstoff	Härte	a_p max.	a_e max.	v_c	f_z bei Nenn-Ø						
					3	6	8	10	12	16	20
P	$\leq 850 \text{ N/mm}^2$	0,05xD	0,05xD	250	0,030	0,060	0,080	0,110	0,130	0,170	0,210
	$\geq 850 \text{ N/mm}^2$	0,05xD	0,05xD	180	0,026	0,053	0,070	0,100	0,120	0,160	0,200
M	$\leq 750 \text{ N/mm}^2$	0,05xD	0,05xD	160	0,021	0,042	0,056	0,080	0,090	0,120	0,150
	$\geq 750 \text{ N/mm}^2$	0,05xD	0,05xD	100	0,016	0,032	0,042	0,060	0,070	0,100	0,120
K	$\leq 240 \text{ HB}$	0,05xD	0,05xD	230	0,028	0,056	0,074	0,100	0,120	0,160	0,200
	$\geq 240 \text{ HB}$	0,05xD	0,05xD	190	0,023	0,047	0,062	0,080	0,100	0,130	0,170
N	$\geq 7 \% \text{ Si}$	0,05xD	0,05xD	330	0,039	0,078	0,104	0,140	0,170	0,220	0,280
H	$\leq 55 \text{ HRC}$	0,05xD	0,05xD	70	0,017	0,033	0,044	0,060	0,070	0,100	0,120
S	Ti-Basis	0,05xD	0,05xD	80	0,009	0,018	0,025	0,033	0,040	0,050	0,070
	Ni-Basis	0,05xD	0,05xD	50	0,004	0,008	0,011	0,017	0,021	0,029	0,039

Fasfräser mit radialem Hinterschliff zum Anfasen und Entgraten:

- besonders weicher Schnitt
- nachschleifbar
- in fast allen Werkstoffen einsetzbar
- hohe Standzeit durch verschleißfeste Beschichtung und ultra-zähes Hartmetall
- Schnittwerte am effektiven Durchmesser berechnen

HPC & HSC Frässtrategien

Richtwerte zur Erhöhung der Schnittwerte bei Schneidenlängen bis 3xD

Werkstoff	Anwendung	radiale Zustellung in % des Ø	v _c Faktor *	f _z Faktor *	Umschlingungswinkel
N P K M S	Nuten	100 %	1	1	180°
	HPC Schruppen	33 %	1,5	1,3	70°
	HPC Schruppen	25 %	1,6	1,5	60°
	HPC Schruppen	20 %	1,7	1,6	53°
	HPC Schruppen	15 %	1,8	1,9	46°
	HSC Schruppen	10 %	1,9	2,3	37°
	HSC Schruppen	8 %	2,0	2,5	31°
	HSC Schruppen	5 %	2,1	2,5	26°
	HSC Schlichten	3 %	2,0	1,2	20°
	HSC Schlichten	2 %	2,0	1,1	18°
N P K M S	HSC Schlichten	1 %	2,0	1,0	11°
	HSC Feinschlichten	0,5 %	2,2	0,9	8°

* Basiswerte für die Berechnung mit den v_c und f_z Faktoren bitte der nachstehenden Tabelle entnehmen:

Basisschnittwerte Nuten – SuperF-UT-Werkzeuge – glattschneidig

Werkstoff	Härte	Anwendung	v _c	f _z bei Nenn-Ø									
				3	4	5	6	8	10	12	16	20	25
P1	≤ 850 N/mm ²	Nuten	180	0,015	0,020	0,025	0,030	0,040	0,060	0,072	0,096	0,120	0,150
P2	850-1200 N/mm ²	Nuten	160	0,014	0,019	0,024	0,029	0,038	0,055	0,066	0,088	0,110	0,138
P3	850-1400 N/mm ²	Nuten	135	0,014	0,018	0,023	0,027	0,036	0,050	0,060	0,080	0,100	0,125
M1	< 750 N/mm ²	Nuten	120	0,014	0,018	0,023	0,027	0,036	0,050	0,060	0,080	0,100	0,125
M2	750-850 N/mm ²	Nuten	80	0,012	0,016	0,020	0,024	0,032	0,045	0,054	0,072	0,090	0,113
M3	> 850 N/mm ²	Nuten	70	0,011	0,014	0,018	0,021	0,028	0,040	0,048	0,064	0,080	0,100
S-Ni	≤ 1300 N/mm ²	Nuten	30	0,008	0,011	0,014	0,017	0,022	0,032	0,038	0,051	0,064	0,080
S-Ti	≤ 1300 N/mm ²	Nuten	60	0,012	0,016	0,020	0,024	0,032	0,045	0,054	0,072	0,090	0,113
K1	≤ 240 HB	Nuten	160	0,017	0,022	0,028	0,033	0,044	0,065	0,078	0,104	0,130	0,163
K2	> 240 HB	Nuten	140	0,015	0,020	0,025	0,030	0,040	0,055	0,066	0,088	0,110	0,138
Alu-Knetleg.	≤ 5 % Si	Nuten	500	0,020	0,026	0,033	0,039	0,052	0,075	0,090	0,120	0,150	0,188
Alu-Gussleg.	> 5 % Si	Nuten	230	0,017	0,022	0,028	0,033	0,044	0,060	0,072	0,096	0,120	0,150
NE-Metalle	≤ 850 N/mm ²	Nuten	250	0,017	0,022	0,028	0,033	0,044	0,060	0,072	0,096	0,120	0,150

Zeitspanvolumen $a_p \text{ (mm)} \times a_e \text{ (mm)} \times v_f \text{ (m/min)} = Q \text{ (cm}^3\text{/min)}$

Beispiel	HPC-Schruppen: 15 % a _e ; 2xD a _p ; C45
Werkzeug	SuperF-UT Typ N Ø 12 mm-4 Schneiden
Zustellung	radiale Zustellung a _e 1,8 mm = 15 % von D
Basiswert Nuten	v _c Nuten = 180 m/min, f _z Nuten = 0,072 mm
Umrechnung	v _c Faktor = 1,8 → v _c : 180 m/min x 1,8 = v _c 324 m/min f _z Faktor = 1,9 → f _z : 0,072 mm x 1,9 = f _z 0,137
Erhöhte Werte	v _c : 324 m/min / f _z : 0,137 mm n: 8594 U/min / v _f : 4710 mm/min
Zeitspanvolumen	Q = 203 cm ³ /min

Reibwerkzeuge

Arbeitsrichtwerte

Vorschubreihen							
Code-Buchstabe	E	F	G	H	I	J	
Werkzeug-Ø/mm	3,15	0,080	0,100	0,125	0,300	0,500	0,800
	4,00	0,100	0,125	0,160	0,300	0,500	1,000
	5,00	0,100	0,125	0,160	0,400	0,600	1,000
	6,30	0,125	0,160	0,200	0,400	0,700	1,200
	8,00	0,160	0,200	0,250	0,600	1,000	1,800
	10,00	0,200	0,250	0,315	0,600	1,200	1,800
	12,50	0,200	0,250	0,315	0,800	1,200	2,000
	16,00	0,250	0,315	0,400	0,800	1,400	2,200
	20,00	0,315	0,400	0,500	0,800	1,400	2,200
	25,00	0,400	0,500	0,630	1,000	1,600	2,500
	31,50	0,400	0,500	0,630	1,000	2,000	3,000
	40,00	0,500	0,630	0,800	1,200	2,000	3,000
50,00	0,630	0,800	1,000	1,400	2,200	3,200	

 Vorschube
f (mm/U)

Für eine optimale Kühlschmierstoffversorgung der Schneiden bei den SuperR-HS-Reibahlen Typ D für Durchgangsbohrungen empfehlen wir die Spannung im Hydrodehn- oder Schrumpffutter mit maximaler Einspanntiefe.

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Durchmesser	Untermaße (Richtwerte)
< 6 mm	0,1-0,2 mm
< 10 mm	0,2 mm
< 16 mm	0,2-0,3 mm
< 25 mm	0,3-0,4 mm
> 25 mm	0,4 mm

Kühlmitteleinsatz:

- Schneidöl, hochaktiviert, grenzflächenaktives Schmiermittel mit wirksamen Stoffen (Additiven), die chemisch reagieren und dabei einen besonders haftenden und verschleißmindernden Schmierfilm erzeugen.
- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		<input checked="" type="checkbox"/>
austenitisch	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850		<input checked="" type="checkbox"/>
martensitisch	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		<input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Temperguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5,-TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input checked="" type="checkbox"/>
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		<input checked="" type="checkbox"/>
langspanend	2.0790 CuNi18Zn19Pb 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	>600-850 ≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch	Epoxidharz, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
thermoplastisch	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt	Kevlar		-	<input type="checkbox"/>
glas-/kohlefaserverstärkt	GFK/CFK		-	<input type="checkbox"/>

Kegelsenker V-NX

Arbeitsrichtwerte

		Vorschubreihen					
Code-Buchstabe		E	F	G	H	I	J
Werkzeug-Ø mm	2,00	0,03	0,04	0,06	0,08	0,10	0,13
	2,50	0,03	0,05	0,07	0,10	0,13	0,16
	3,15	0,03	0,05	0,08	0,11	0,15	0,20
	4,00	0,04	0,06	0,09	0,13	0,17	0,22
	5,00	0,04	0,07	0,10	0,14	0,18	0,23
	6,30	0,04	0,07	0,12	0,15	0,19	0,24
	8,00	0,05	0,08	0,13	0,16	0,20	0,25
	10,00	0,06	0,09	0,14	0,17	0,22	0,26
	12,50	0,06	0,10	0,15	0,19	0,23	0,28
	16,00	0,07	0,11	0,17	0,21	0,26	0,31
	20,00	0,08	0,13	0,18	0,23	0,28	0,33
	25,00	0,09	0,15	0,21	0,26	0,30	0,38
	31,50	0,12	0,17	0,24	0,30	0,36	0,42
	40,00	0,14	0,21	0,28	0,34	0,40	0,46

Werkzeuge mit fett gedruckten Vorschubreihen-Codebuchstaben sind für die entsprechende Werkstoffgruppe vorrangig einzusetzen.

Kühlmitteleinsatz::

Schneidöl, hochaktiviert, grenzflächenaktives Schmiermittel mit wirksamen Stoffen (Additiven), die chemisch reagieren und dabei einen besonders haftenden und verschleißmindernden Schmierfilm erzeugen.

- Bohrölemulsion
- ohne Schmiermittel
- nur Luftkühlung

Werkstoffgruppe	Werkstoffbeispiele, neue Bezeichnung (in Klammern alte Bezeichnung) Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN	Zugfestigkeit MPa (N/mm ²)	Härte	Kühl- mittel
Allgemeine Baustähle	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Automatenstähle	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Vergütungsstähle	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Legierte Vergütungsstähle	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unlegierte Einsatzstähle	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Legierte Einsatzstähle	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitrierstähle	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	>850-≤1000 ≥1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Werkzeugstähle	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Schnellarbeitsstähle	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Federstähle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Gehärtete Stähle	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Rostfreie Stähle, geschwefelt austenitisch martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Gusseisen	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kugelgraphit- und Temperguss	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Hartguss	-		≤350 HB	<input checked="" type="checkbox"/>
Neue Gusswerkstoffe GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Neue Gusswerkstoffe ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Sonderlegierungen	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titan und Titan-Legierungen	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium und Al-Legierungen	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al-Knetlegierungen	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al-Gusslegierungen ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Magnesium-Legierungen	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Kupfer, niedriglegiert	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Messing, kurzspanend	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input checked="" type="checkbox"/>
langspanend	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input checked="" type="checkbox"/>
Bronzen, kurzspanend	2.1090 CuSn7ZnPh, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzen, langspanend	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Kunststoffe, duroplastisch	Epoxidharz, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
thermoplastisch	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Kunststoffe, aramidfaserverstärkt	Kevlar		-	<input type="checkbox"/>
glas-/kohlefaserverstärkt	GFK/CFK		-	<input type="checkbox"/>

Katalog-Nr.	52348
Schneidstoff	HSS-Co
Oberfläche	AlTiN
DIN	335
Kegelwinkel	90°
Schaftform	zylindrisch
Katalogseite	234

Katalog-Nr.	52350
Schneidstoff	HSS-Co
Oberfläche	AlTiN
DIN	335
Kegelwinkel	90°
Schaftform	3-Flächen
Katalogseite	235

Katalog-Nr.	52398
Schneidstoff	HSS-Co
Oberfläche	AlTiN
DIN	335
Kegelwinkel	90°
Schaftform	zylindrisch
Katalogseite	236

Katalog-Nr.	52399
Schneidstoff	HSS-Co
Oberfläche	AlTiN
DIN	335
Kegelwinkel	90°
Schaftform	3-Flächen
Katalogseite	237



V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code	V _c m/min	VR-Code
41	G	41	G	41	G	41	G
39	F	39	F	39	F	39	F
41	G	41	G	41	G	41	G
39	F	39	F	39	F	39	F
41	G	41	G	41	G	41	G
39	G	39	G	39	G	39	G
25	F	25	F	25	F	25	F
19	G	19	G	19	G	19	G
15	F	15	F	15	F	15	F
32	G	32	G	32	G	32	G
19	G	19	G	19	G	19	G
13	F	13	F	13	F	13	F
19	F	19	F	19	F	19	F
15	E	15	E	15	E	15	E
22	F	22	F	22	F	22	F
19	E	19	E	19	E	19	E
19	E	19	E	19	E	19	E
13	E	13	E	13	E	13	E
20	F	20	F	20	F	20	F
15	E	15	E	15	E	15	E
18	E	18	E	18	E	18	E
32	G	32	G	32	G	32	G
20	G	20	G	20	G	20	G
28	G	28	G	28	G	28	G
25	G	25	G	25	G	25	G
10	E	10	E	10	E	10	E
28	G	28	G	28	G	28	G
18	G	18	G	18	G	18	G
10	E	10	E	10	E	10	E
19	F	19	F	19	F	19	F
13	E	13	E	13	E	13	E
101	H	114	H	101	H	114	H
89	H	89	H	89	H	89	H
51	G	51	G	51	G	51	G
39	G	39	G	39	G	39	G
127	H	127	H	127	H	127	H
76	H	76	H	76	H	76	H
101	H	101	H	101	H	101	H
64	H	64	H	64	H	64	H
39	H	39	H	39	H	39	H
33	H	33	H	33	H	33	H
31	H	31	H	31	H	31	H
25	H	25	H	25	H	25	H
39	H	39	H	39	H	39	H
51	H	51	H	51	H	51	H

Katalog-Nr.	Seite	Norm	Oberfläche	Bezeichnung	Schneidstoff	Typ
51146	81	DIN 6537K	AlTiN	Spiralbohrer mit verstärktem Zylinderschaft	VHM	H
51290	80	Werksnorm	TiAlN nano	Spiralbohrer kurz	VHM	N
51670	31	DIN 6537K	AlTiN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-VA
51673	23	DIN 6537K	TiAlN nano	SuperV-Bohrer ohne Innenkühlung	VHM	SuperV-U
51674	45	DIN 6537L	AlTiN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-VA
51676	29	DIN 6537K	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-IK-U
51681	43	DIN 6537L	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-IK-U
51687	27	DIN 6537L	TiAlN nano	SuperV-Bohrer ohne Innenkühlung	VHM	SuperV-U
51718	39	Werksnorm	TiAlN nano	Pilotbohrer mit Kühlkanälen	VHM	SuperV-180
51720	69	Werksnorm	AlTiN	SuperV-M Universal-Kleinstbohrer	VHM	SuperV-M
51750	25	DIN 6537K	TiAlSiN	SuperV-Bohrer ohne Innenkühlung	VHM	SuperV-S
51752	35	DIN 6537K	TiAlSiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-S
51753	37	DIN 6537K	TiAlSiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-S
51754	49	DIN 6537L	TiAlSiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-S
51755	51	DIN 6537L	TiAlSiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-S
51756	55	Werksnorm	TiAlSiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-S
51764	58	Werksnorm	AlTiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T
51765	61	Werksnorm	AlTiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T
51766	64	Werksnorm	AlTiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T
51767	67	Werksnorm	AlTiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T
51768	68	Werksnorm	AlTiN	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T
51784	33	DIN 6537K	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-X
51786	47	DIN 6537L	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-X
51791	53	Werksnorm	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-X
51792	56	Werksnorm	TiAlN nano	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-X
51970	75	Werksnorm	TiSiN+	SuperV-NX VA Hochleistungs-Kleinstbohrer ohne Innenkühlung	VHM	SuperV-NX VA
51971	76	Werksnorm	TiSiN+	SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-NX VA
51972	77	Werksnorm	TiSiN+	SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-NX VA
51973	78	Werksnorm	TiSiN+	SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-NX VA
51974	79	Werksnorm	TiSiN+	SuperV-NX VA Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-NX VA
51980	74	Werksnorm	AlTiN	SuperV-NX U Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-IK NX-U
51997	71	Werksnorm	AlTiN	SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-IK-NX
51998	72	Werksnorm	AlTiN	SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-IK-NX
51999	73	Werksnorm	AlTiN	SuperV-NX Hochleistungs-Kleinstbohrer mit Innenkühlung	VHM	SuperV-IK-NX
52348	234	DIN 335	AlTiN	Kegelsenker 90° V-NX	HSCO	V-NX
52350	235	DIN 335	AlTiN	Kegelsenker 90° V-NX	HSCO	V-NX
52398	236	DIN 335	AlTiN	Kegelsenkersätze 90° V-NX	HSCO	V-NX
52399	237	DIN 335	AlTiN	Kegelsenkersätze 90° V-NX	HSCO	V-NX
52920	230	Werksnorm	AlTiN nano	VHM NC-Maschinen-Reibahlen	VHM	
52930	232	Werksnorm	AlTiN nano	VHM NC-Maschinen-Reibahlen	VHM	
53399	224	Werksnorm	TiAlZrN	Entgratfräser 90°	VHM	SuperAF-90
53610	149	~DIN 371/~DIN 376	TiCN	Kühlkanal-Gewindeformer für Metr. ISO-Gewinde	HSS-E-PM	Durativ N-X
53612	151	~DIN 374	TiCN	Kühlkanal-Gewindeformer für Metr. ISO-Feingewinde	HSS-E-PM	Durativ N-X
53618	150	~DIN 371/~DIN 376	TiCN	Kühlkanal-Gewindeformer für Metr. ISO-Gewinde	HSS-E-PM	Durativ N-X
53619	152	~DIN 374	TiCN	Kühlkanal-Gewindeformer für Metr. ISO-Feingewinde	HSS-E-PM	Durativ N-X
53630	143	~DIN 371/~DIN 376	TiCN	Gewindeformer für Metrische ISO-Gewinde	HSS-E-PM	Durativ N-X
53631	144	~DIN 371/~DIN 376	TiCN	Gewindeformer für Metrische ISO-Gewinde	HSS-E-PM	Durativ N-X
53632	145	~DIN 374	TiCN	Gewindeformer für Metrische ISO-Feingewinde	HSS-E-PM	Durativ N-X
53633	146	~DIN 371/~DIN 376	TiCN	Gewindeformer für UNC-Gewinde	HSS-E-PM	Durativ N-X
53634	147	~DIN 371/~DIN 374	TiCN	Gewindeformer für UNF-Gewinde	HSS-E-PM	Durativ N-X
53635	148	DIN 2189	TiCN	Gewindeformer für Whitworth-Rohrgewinde	HSS-E-PM	Durativ N-X
53640	118	DIN 371/DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Produktiv H
53642	117	DIN 371/DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv H
53646	115	DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	H
53647	116	~DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	H
53661	121	DIN 371/DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv H
53664	122	DIN 371/DIN 376	TiAlN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Intensiv H
53676	123	DIN 371/DIN 376	TiCN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	H
53733	99	~DIN 371/~DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N-X
53734	100	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N-X LH
53735	101	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Produktiv N-X
53736	102	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Produktiv N-X
53737	103	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N-X
53738	104	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N-X
53739	105	Werksnorm	AlTiZrN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N-X
53746	106	~DIN 371/~DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X
53747	107	DIN 371/DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X LH
53748	108	DIN 371/DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Intensiv N-X
53749	109	DIN 371/DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E-PM	Intensiv N-X
53750	111	DIN 371/DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X
53751	112	DIN 371/DIN 376	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X
53752	113	Werksnorm	TiAlN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X

Katalog-Nr.	Seite	Norm	Oberfläche	Bezeichnung	Schneidstoff	Typ
53760	110	DIN 371/DIN 376	TiAIN-H	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv N-X
53770	131	DIN 374	TiAIN-H	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Intensiv N-X
53775	142	DIN 5156	TiAIN-H	Gewindebohrer für Whitworth-Rohrgewinde	HSS-E	Intensiv N-X
53778	124	DIN 374	AlTiZrN	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Produktiv N-X
53779	127	DIN 374	AlTiZrN	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Produktiv N-X
53780	128	DIN 374	TiAIN-H	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Intensiv N-X
53781	132	DIN 374	TiAIN-H	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Intensiv N-X
53782	134	DIN 371/DIN 376	AlTiZrN	Gewindebohrer für UNC-Gewinde	HSS-E	Produktiv N-X
53783	135	DIN 371/DIN 376	TiAIN-H	Gewindebohrer für UNC-Gewinde	HSS-E	Intensiv N-X
53784	136	~DIN 371/~DIN 374	AlTiZrN	Gewindebohrer für UNF-Gewinde	HSS-E	Produktiv N-X
53785	137	~DIN 371/~DIN 374	TiAIN-H	Gewindebohrer für UNF-Gewinde	HSS-E	Intensiv N-X
53789	125	DIN 374	AlTiZrN	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E-PM	Produktiv N-X
53790	126	DIN 374	AlTiZrN	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E-PM	Produktiv N-X
53791	129	DIN 374	TiAIN-H	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E-PM	Intensiv N-X
53792	130	DIN 374	TiAIN-H	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E-PM	Intensiv N-X
53793	138	~DIN 371	AlTiZrN	Gewindebohrer für BSW-Gewinde	HSS-E	Produktiv N-X
53794	139	~DIN 371	TiAIN-H	Gewindebohrer für BSW-Gewinde	HSS-E	Intensiv N-X
53795	140	DIN 5156	AlTiZrN	Gewindebohrer für Whitworth-Rohrgewinde	HSS-E	Produktiv N-X
53796	141	DIN 5156	TiAIN-H	Gewindebohrer für Whitworth-Rohrgewinde	HSS-E	Intensiv N-X
53831	159	Werksnorm	AlTiZrN	Gewindefräser ohne Senkfase für Whitworth-Rohrgewinde	VHM	TM SP
53832	160	Werksnorm	AlTiZrN	Mehrbereichsgewindefräser für Whitworth-Rohrgewinde	VHM	TMU SP
53840	162	Werksnorm	AlTiZrN	Mikrogewindefräser für Metrische ISO-Gewinde	VHM	TM SP
53841	164	Werksnorm	AlTiZrN	Mikrogewindefräser für Whitworth-Rohrgewinde	VHM	TM SP
53850	163	Werksnorm	TiSiN+	Mikrogewindefräser für Metrische ISO-Gewinde	VHM	TM SP
53860	157	Werksnorm	AlTiZrN	Gewindefräser ohne Senkfase für Metr. ISO-Gewinde	VHM	TM SP
53890	156	Werksnorm	AlCrN	Gewindefräser mit Senkfase für Metrische ISO-Gewinde	VHM	TMC-NX SP
53892	161	Werksnorm	AlTiZrN	Mikrogewindefräser für Metrische ISO-Gewinde	VHM	MTM-NX SP
53948	153	Werksnorm	TiSiN+	Bohrgewindefräser für Metrische ISO-Gewinde	VHM	TMD-NX
53949	154	Werksnorm	TiSiN+	Bohrgewindefräser für UNC-/UNF-Gewinde	VHM	TMD-NX
53950	155	Werksnorm	TiSiN+	Bohrgewindefräser für Rohrgewinde	VHM	TMD-NX
54302	223	Werksnorm	TiAlSiN	Kopierfräser mit Torusanschiff	VHM	NH
54304	221	Werksnorm	TiAlSiN	Kopierfräser mit Torusanschiff	VHM	H
54305	222	Werksnorm	TiAlSiN	Kopierfräser mit Torusanschiff	VHM	H
54325	204	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius H B2	VHM	H B2
54326	205	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius H B2	VHM	H B2
54340	180	DIN 6527L	TiAlSiN	SuperF-UT-Fräser H-X	VHM	SuperF-UT H-X
54341	181	DIN 6527L	TiAlSiN	SuperF-UT-Fräser H-X	VHM	SuperF-UT H-X
54345	206	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius H B4	VHM	H B4
54346	207	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius H B4	VHM	H B4
54347	212	Werksnorm	TiSiN+	Kopierfräser mit Torusanschiff H T4	VHM	H T4
54348	213	Werksnorm	TiSiN+	Kopierfräser mit Torusanschiff H T4	VHM	H T4
54360	218	Werksnorm	TiAlSiN	Hartfräser, mehrschneidig H FS6	VHM	H FS6
54361	219	Werksnorm	TiAlSiN	Hartfräser, mehrschneidig H FS6	VHM	H FS6
54362	220	Werksnorm	TiAlSiN	Hartfräser, mehrschneidig H FS6	VHM	H FS6
54425	208	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius S B2	VHM	S B2
54426	209	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius S B2	VHM	S B2
54427	214	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Torusanschiff S T2	VHM	S T2
54428	215	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Torusanschiff S T2	VHM	S T2
54445	210	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius S B4	VHM	S B4
54446	211	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Vollradius S B4	VHM	S B4
54447	216	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Torusanschiff S T4	VHM	S T4
54448	217	Werksnorm	TiSiN+/ TiAlSiN	Kopierfräser mit Torusanschiff S T4	VHM	S T4
54500	187	Werksnorm	AlCrN	SuperF-UT-Fräser U	VHM	SuperF-UT U
54501	188	Werksnorm	AlCrN	SuperF-UT-Fräser U	VHM	SuperF-UT U
54502	189	Werksnorm	AlCrN	SuperF-UT-Fräser UL	VHM	SuperF-UT UL
54503	190	Werksnorm	AlCrN	SuperF-UT-Fräser UL	VHM	SuperF-UT UL
54542	192	DIN 6527L	TiAlSiN	SuperF-UT-Fräser VA-r	VHM	SuperF-UT VA-r
54550	185	DIN 6527L	AlCrN	SuperF-UT-Fräser N-r	VHM	SuperF-UT N-r
54553	184	Werksnorm	TiAIN	SuperF-UT-Fräser NL	VHM	SuperF-UT NL
54555	167	Werksnorm	AlTiN+	SuperF-UT-Fräser ZS-r	VHM	SuperF-UT ZS-r
54556	182	DIN 6527L	AlTiN nano	SuperF-UT-Fräser S	VHM	SuperF-UT S
54560	178	DIN 6527L	ZrN	SuperF-UT-Fräser Ti	VHM	SuperF-UT Ti
54561	179	DIN 6527L	ZrN	SuperF-UT-Fräser Ti	VHM	SuperF-UT Ti
54577	165	Werksnorm	AlTiN+	SuperF-UT-Fräser Z	VHM	SuperF-UT Z
54578	166	Werksnorm	AlTiN+	SuperF-UT-Fräser ZS	VHM	SuperF-UT ZS
54581	168	Werksnorm	AlTiN+	SuperF-UT-Fräser ZS-7	VHM	SuperF-UT ZS-7
54583	169	Werksnorm	TiAIN	SuperF-UT-Fräser N-5	VHM	SuperF-UT N-5
54584	170	Werksnorm	TiAIN	SuperF-UT-Fräser N-5	VHM	SuperF-UT N-5
54585	175	DIN 6527L	TiAlSiN	SuperF-UT-Fräser NX-1K	VHM	SuperF-UT NX-1K
54586	172	Werksnorm	TiAlSiN	SuperF-UT-Fräser NX-3	VHM	SuperF-UT NX-3
54587	173	Werksnorm	TiAlSiN	SuperF-UT-Fräser NX-3	VHM	SuperF-UT NX-3
54589	174	DIN 6527K	TiAlSiN	SuperF-UT-Fräser NX	VHM	SuperF-UT NX

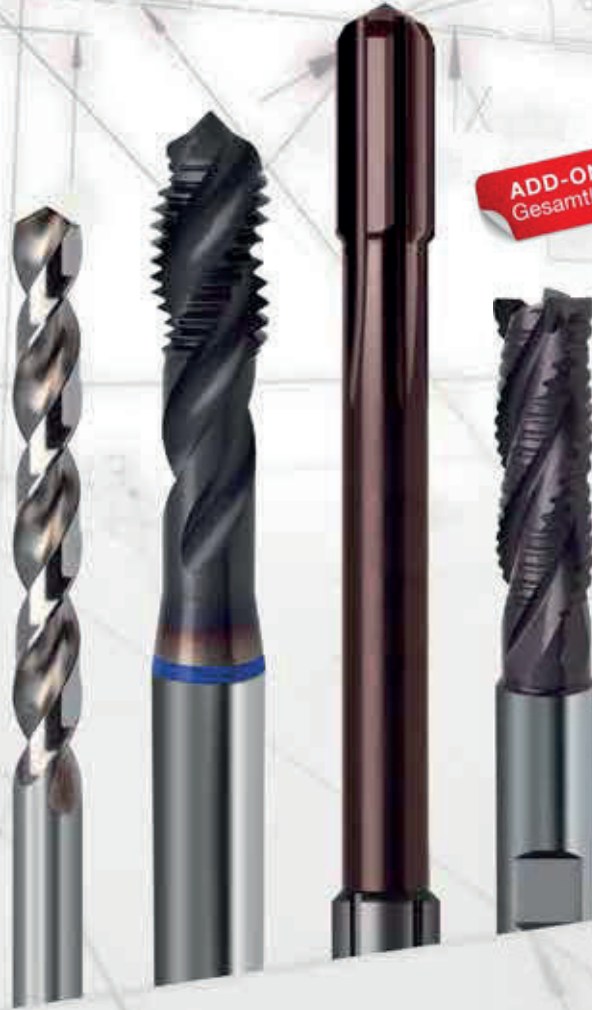
Katalog-Nr.	Seite	Norm	Oberfläche	Bezeichnung	Schneidstoff	Typ
54592	201	Werksnorm	DLC	SuperF-UT-Fräser Al-X	VHM	SuperF-UT Al-X
54593	200	Werksnorm	DLC	SuperF-UT-Fräser N	VHM	SuperF-UT Al-X
54594	176	Werksnorm	TiSiN+	SuperF-UT-Fräser NX Micro	VHM	SuperF-UT NX Micro
54595	177	Werksnorm	TiSiN+	SuperF-UT-Fräser NX Micro	VHM	SuperF-UT NX Micro
61131	87	DIN 1897	AlTiZrN	Spiralbohrer extra kurz	HSS-Co	V18
61232	89	DIN 338	AlTiZrN	Spiralbohrer kurz	HSS-Co	V18
63033	114	DIN 371/DIN 376	TiN	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Produktiv N
63399	225	Werksnorm	TiAlZrN	Entgratfräser 90°, spiralisiert	VHM	Super AFX-90
64552	183	DIN 6527L	TiAlZrN	SuperF-UT-Fräser N ²	VHM	SuperF-UT N ²
64553	191	DIN 6527L	TiAlZrN	SuperF-UT-Fräser VA-X ²	VHM	SuperF-UT VA-X ²
64560	171	Werksnorm	TiAlZrN	SuperF-UT-Fräser FS ²	VHM	SuperF-UT FS ²
65030	82	Werksnorm	TiN	Einlippenbohrer SuperT-NXL	HM	SuperT-NXL
65031	83	Werksnorm	TiN	Einlippenbohrer SuperT-NXL	HM	SuperT-NXL
65032	84	Werksnorm	TiN	Einlippenbohrer SuperT-NXL	HM	SuperT-NXL
65033	85	Werksnorm	TiN	Einlippenbohrer SuperT-NXL	HM	SuperT-NXL
71018	91	DIN 338	Bronze-VAP	V16-Spiralbohrer	M42	V16
71019	93	DIN 338	Bronze-VAP	V16-Spiralbohrer-Sätze	M42	V16
71020	94	Werksnorm		V16-Pocket-Satz (Spiralbohrer, Gewindebohrer und Senker)		N
71140	95	NAS 907	blank	Stangenbohrer, Länge 6 inches	HSS	N
71141	97	NAS 907	blank	Stangenbohrer, Länge 12 inches	HSS	N
71142	96	NAS 907	nitriert	Stangenbohrer, Länge 6 inches	HSS	N
71143	98	NAS 907	nitriert	Stangenbohrer, Länge 12 inches	HSS	N
71660	86	Werksnorm	dampfbehandelt	Karosseriebohrer	HSS	N
71764	59	Werksnorm	blank	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T-Al
71765	62	Werksnorm	blank	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T-Al
71766	65	Werksnorm	blank	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-T-Al
71791	41	DIN 6537L	blank	SuperV-Bohrer mit Innenkühlung	VHM	SuperV-Al
72874	226	Werksnorm	AlTiN nano	VHM-Hochleistungs-Kopfreibahnen	VHM	SuperR-HS-KS
72875	227	Werksnorm	AlTiN nano	VHM-Hochleistungs-Kopfreibahnen	VHM	SuperR-HS-KD
72876	228	Werksnorm	DLC	VHM-Hochleistungs-Reibahnen	VHM	SuperR-HS-S
72877	229	Werksnorm	DLC	VHM-Hochleistungs-Reibahnen	VHM	SuperR-HS-D
73647	133	DIN 374	nitriert	Gewindebohrer für Metrische ISO-Feingewinde	HSS-E	Intensiv H
73661	119	DIN 371	nitriert	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv H
73664	120	DIN 376	nitriert	Gewindebohrer für Metrische ISO-Gewinde	HSS-E	Intensiv H
73830	158	Werksnorm	AlTiZrN	Gewindefräser ohne Senkfase für Metr. ISO-Gewinde	VHM	TMU SP
74556	195	Werksnorm	blank	SuperF-UT-Fräser Al-L	VHM	SuperF-UT Al-L
74557	194	Werksnorm	blank	SuperF-UT-Fräser Al	VHM	SuperF-UT Al-L
74558	197	Werksnorm	blank	SuperF-UT-Fräser Al-XL	VHM	SuperF-UT Al-XL
74559	196	Werksnorm	blank	SuperF-UT-Fräser Al	VHM	SuperF-UT Al-XL
74562	199	Werksnorm	blank	SuperF-UT-Fräser Al-r	VHM	SuperF-UT Al-r
74563	198	Werksnorm	blank	SuperF-UT-Fräser N	VHM	SuperF-UT Al-r
78719	233	Werksnorm	blank	Schrumpferlängerungen		
78882	202	Werksnorm	AlTiN+	SuperF-UT-Fräser Z, Sätze	VHM	SuperF-UT Z
78883	203	DIN 6527L	TiAlZrN	SuperF-UT-Fräser N ² , Sätze	VHM	SuperF-UT N ²



seit 130 Jahren Präzision

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ADD-ON zum
Gesamtkatalog



 **STOCK**

Tel. +49 30 40903-33 300 | info@stock.de
Lengeder Str. 29-35 | 13407 Berlin | Deutschland
www.stock.de