Wo Präzision Massstäbe setzt.
Quand la précision repousse ses limites.
Dove la precisione mette nuovi limiti.
Where precision sets standards.

SPHINX
Swissmade tools
Your partner

Die Sphinx Werkzeuge AG ist ein führendes Unternehmen für die Herstellung und den Vertrieb von Präzisionswerkzeugen für die zerspanende Fertigung. Kontinuierliches Wachstum, konsequente Reinvestitionen in die Produktionsanlagen sowie das persönliche Engagement der Mitarbeiter ergeben die weltweit starke Position. Die Kundenbedürfnisse sehen wir als Leitfaden aller Innovationen. Deshalb vertrauen renommierte Firmen aus Industrie und Medizinaltechnik auf unsere Qualität und Erfahrung. Durch Kundennähe und fundiertes Wissen lösen wir komplexe Aufgabenstellungen, bieten oft einzigartige Lösungen und leisten damit einen wesentlichen Beitrag zum Markterfolg namhafter Unternehmen. Auch in Zukunft wird der stetig anspruchsvoller werdende Markt unsere tägliche Herausforderung sein!

Sphinx Outils SA est une entreprise leader dans la fabrication et la vente d'outils de précision pour la production avec enlèvement de copeaux. Une croissance continue, des investissements réguliers pour les installations de production ainsi que l'engagement de collaborateurs qualifiés ont permis à l'entreprise de se forger une excellente réputation sur le marché mondial. Les besoins de notre clientèle sont pour nous une source permanente d'innovation. C'est la raison pour laquelle des sociétés renommées de l'industrie et de la technique médicale font confiance à notre qualité et à notre expérience.

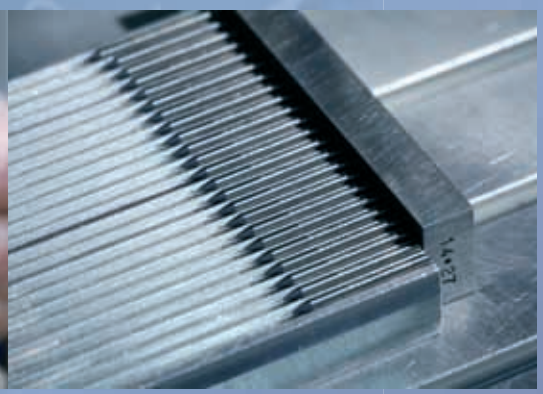
Grâce à notre proximité avec la clientèle et à notre savoir-faire, nous résolvons des tâches complexes, offrons des solutions souvent uniques et contribuons ainsi largement au succès de nombreuses d'entreprises de renom. Les exigences croissantes du marché sont notre défi quotidien!

Sphinx ist der richtige Partner.
Sphinx est le partenaire idéal.
Sphinx è il partner ideale.
Sphinx is the right partner.



La Sphinx Utensili srl è un'azienda leader nella fabbricazione e vendita di utensili di precisione per la lavorazione a taglio.
Una crescita continua, conseguenti reinvestizioni nell'impianto di produzione come l'impegno personale dei collaboratori ci permette di avere una forte posizione sul mercato mondiale. I bisogni della clientela sono per noi fonte d'innovazione.
E per questo motivo che società rinomate dell'industria e della tecnica medica confidano nella nostra qualità e nella nostra esperienza.
Grazie alla nostra vicinanza alla clientela e il nostro fondato know-how, siamo in grado di risolvere richieste complesse, offrendo delle soluzioni spesso uniche e contribuendo al successo del mercato delle aziende più rinomate.
Anche nel futuro le constante esigenze del mercato saranno la nostra sfida quotidiana.

Sphinx Tools Ltd. is a leading company for the production and sale of precision machining tools. Its strong international position today is a result of continuous growth, consistent reinvestment in the production plants and the personal dedication of the employees. We view customer needs as the motivation of all our innovations. That is why renowned industrial and medical companies rely on our quality and experience. Our closeness to customers and solid knowledge allows us to solve complex tasks and offer what are often unique solutions. In doing so, we contribute substantially to the market success of well-known companies. The market is becoming ever more demanding. Meeting those demands is our daily challenge today and in the future.



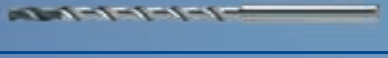
Mikrobohren ≤ ø 3.00 mm
Micro perçage ≤ ø 3.00 mm
Micro foratura ≤ ø 3.00 mm
Micro drilling ≤ ø 3.00 mm

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
Mikro NC-Anbohrer, Pilotbohrer mit verstärktem Schaft ohne Innenkühlung **Micro foret à pointer, foret de préperçage avec manche renforcé sans trou d'huile**						
	50806	0.50–3.00	0.10		60°+/- 1°	20°
	50809	0.50–1.90	0.10		90°+/- 1°	20°
	56005	0.10–1.50	0.05	2–4×ø	130°	20°
	56030	0.10–1.00	0.01	2×ø	130°	30°
	56033	0.03–2.00	0.01	2×ø	130°	30°
	56036	0.40–3.00	0.05	2×ø	140°/90°	30°
	16004	0.10–1.50	0.05	2–3×ø	130°	20°
Mikrobohrer mit verstärktem Schaft ohne Innenkühlung **Micro foret avec manche renforcé sans trou d'huile**						
	50695	0.20–1.50	0.01	6×ø	118°	30°
	50699	0.05–2.00	0.01	6×ø	118°	30°
	51200	0.03–3.00	0.01	6×ø	130°	35°
	51201	0.20–3.00	0.01	6×ø	130°	35°
	50620	0.50–1.60	0.50	10–15×ø	118°	25°
	50621	0.20–3.00	0.01	12×ø	130°	25°
	50622	0.20–3.00	0.01	12×ø	130°	25°
	50941	0.50–2.40	0.05	6×ø	140°	30°
	55652	0.20–2.99	0.01	5×ø	140°	35°
	12604	0.05–3.175	0.01	5–8×ø	118°	25°
	11654	0.50–2.30	0.05	6×ø	120°	30°

* siehe Legende S. 192 + 193
see legend p. 192 + 193

✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe* Workpiece material* P	M	K	S	N	H	O	Anwendung* Application*	Seite Page
Micro punta a centrare, punta per preforo con gambo rinforzato senza fori di lubrificazione Micro NC spotting drill, pilot drill with reinforced shank without internal coolant									
VHM / MD / SC	✓	✓	✓	•	✓		✓		9
VHM / MD / SC	✓	✓	✓	•	✓		✓		10
VHM / MD / SC	✓	•	✓	•	✓		✓		11
VHM / MD / SC	✓	✓	✓	✓	✓		✓		12
VHM / MD / SC	✓	✓	✓	✓	✓		✓		13
VHM / MD / SC; AlCrN	✓	✓	✓	✓	✓	•	•		15
HSS-E	✓	•	✓		•		•		16
Micro punta con gambo rinforzato senza fori di lubrificazione Micro drill with reinforced shank without internal coolant									
VHM / MD / SC	✓	•	✓		✓		•		18
VHM / MD / SC	✓	•	✓		✓		•		19
VHM / MD / SC	✓	✓	✓	✓	✓		•		21
VHM / MD / SC; TiAlN	✓	✓	✓	✓	✓	•	•		23
VHM / MD / SC	✓	•	✓		✓		•		25
VHM / MD / SC	✓	•	✓		✓		•		26
VHM / MD / SC; TiAlN	✓	•	✓	•	✓	•	•		28
VHM / MD / SC; TiAlN	✓	✓	✓	✓	✓	•	✓		30
VHM / MD / SC	✓	•	✓	•	✓		•		31
HSS-E	✓	•	✓		•		•		33
HSS-E	✓	•	✓		•				34

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bohrtiefe Cutting length	Spitzen- winkel Point angle	Spiral- winkel Helix angle	
Mikro Hochleistungsbohrer Phoenix-TC2 mit verstärktem Schaft mit Innenkühlung **Micro foret à grand rendement Phoenix-TC2 avec manche renforcé avec trou d'huile**							
	52903	1.00–3.00	0.05	3×ø	140°	30°	
	52906	1.00–3.00	0.05	6×ø	140°	30°	
	52909	1.00–3.00	0.10	9×ø	140°	30°	
	52912	1.00–3.00	0.10	12×ø	137°	30°	
	52916	1.00–3.00	0.10	16×ø	137°	30°	

* siehe Legende S. 192 + 193
see legend p. 192 + 193

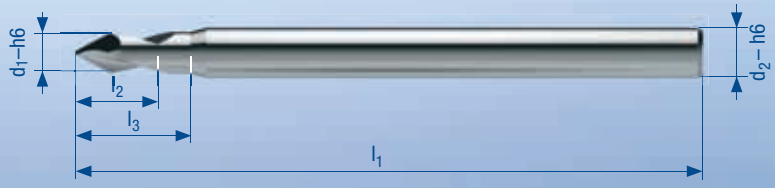
✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe* Workpiece material* P	M	K	S	N	H	O	Anwendung* Application*	Seite Page
Micro punta ad alto rendimento Phoenix-TC2 con gambo rinforzato con fori di lubrificazione Micro high performance drill Phoenix-TC2 with reinforced shank with internal coolant									
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		36
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		37
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		38
VHM / MD / SC; AlCrTin	✓	✓	✓	✓	✓	•	•		39
VHM / MD / SC; AlCrTin	✓	✓	✓	✓	✓	•	•		40

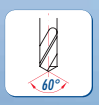
Mikro-NC-Anbohrer und Anfaser 60° Art. 50806

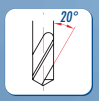
Micro foret à pointer NC et chanfreiner 60°
Micro punta a centrare e smusso NC 60°
Micro NC spotting drill and chamfering 60°

P1–3 | M1,2 | K1,2 | N1–5 | N7,8 | S1 | 01



VHM MD/SC | SPHINX NORM | Typ N | Z 2





Vc → S./p. 160

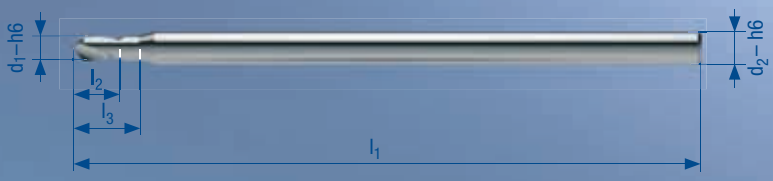
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	1.50	2.00	38	3.00
0.60	1.50	2.00	38	3.00
0.70	1.50	2.00	38	3.00
0.80	2.00	2.50	38	3.00
0.90	2.00	2.50	38	3.00
1.00	2.00	2.50	38	3.00
1.10	2.50	3.50	38	3.00
1.20	2.50	3.50	38	3.00
1.30	2.50	3.50	38	3.00
1.40	3.00	4.00	38	3.00
1.50	3.00	4.00	38	3.00
1.60	3.00	4.00	38	3.00
1.70	4.00	5.00	38	3.00
1.80	4.00	5.00	38	3.00
1.90	4.00	5.00	38	3.00
2.00	5.00	6.00	38	3.00
2.10	5.00	6.00	38	3.00
2.20	5.00	6.00	38	3.00
2.30	6.00	7.00	38	3.00
2.40	6.00	7.00	38	3.00
2.50	6.00	7.00	38	3.00
2.60	7.00	8.00	38	3.00
2.70	7.00	8.00	38	3.00
2.80	7.00	8.00	38	3.00
2.90	7.00	8.00	38	3.00
3.00	9.50	9.50	38	3.00

Mikro-NC-Anbohrer 90 °

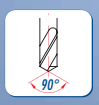
Micro foret à pointer NC 90°
Micro punta a centrare NC 90°
Micro NC spotting drill 90°

Art. 50809

P1–3 | M1,2 | K1,2 | N1–5 | N7,8 | S1 | 01

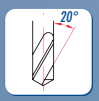


VHM MD/SC | SPHINX NORM



Typ N

Z 2



In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 160

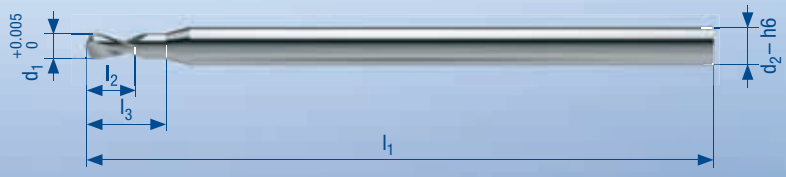
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	1.00	1.60	38	2.00
0.60	1.20	1.80	38	2.00
0.70	1.40	2.00	38	2.00
0.80	1.60	2.20	38	2.00
0.90	1.80	2.40	38	2.00
1.00	2.00	2.60	38	2.00
1.10	2.20	2.80	38	2.00
1.20	2.40	3.00	38	2.00
1.30	2.60	3.20	38	2.00
1.40	2.80	3.40	38	2.00
1.50	3.00	3.80	38	2.00
1.60	3.20	4.20	38	2.00
1.70	3.40	4.40	38	2.00
1.80	3.60	4.60	38	2.00
1.90	3.80	4.80	38	2.00
2.00	5.00	6.00	38	3.00
2.50	6.50	8.00	38	3.00
3.00	7.50	7.50	38	3.00

Mikro-NC-Anbohrer 130°

Micro foret à pointer NC 130°
Micro punta a centrare NC 130°
Micro NC spotting drill 130°

Art. 56005

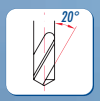
P1–3 | M1 | K1,2 | N1–5 | N7,8 | S1 | 01

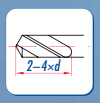


VHM MD/SC | SPHINX NORM

d_1 + 0.005 0

Z 2





In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 160

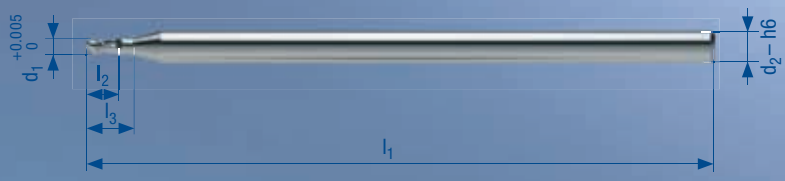
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.10	0.40	0.60	25	1.50
0.15	0.40	0.60	25	1.50
0.20	0.60	0.90	25	1.50
0.25	0.60	0.90	25	1.50
0.30	0.90	1.20	25	1.50
0.35	0.90	1.20	25	1.50
0.40	0.90	1.60	25	1.50
0.45	0.90	1.60	25	1.50
0.50	1.00	1.80	25	1.50
0.55	1.00	1.80	25	1.50
0.60	1.20	2.00	25	1.50
0.65	1.20	2.00	25	1.50
0.70	1.50	2.50	25	1.50
0.75	1.50	2.50	25	1.50
0.80	1.50	2.50	25	1.50
0.85	1.50	2.50	25	1.50
0.90	1.60	2.60	25	1.50
0.95	1.60	2.60	25	1.50
1.00	2.00	3.20	25	1.50
1.05	2.00	3.20	25	1.50
1.10	2.30	3.50	25	1.50
1.15	2.30	3.50	25	1.50
1.20	2.30	3.50	25	1.50
1.25	2.30	3.50	25	1.50
1.30	2.70	4.20	25	1.50
1.35	2.70	4.20	25	1.50
1.40	2.70	4.20	25	1.50
1.45	2.70	4.20	25	1.50
1.50	3.00	4.20	25	1.50

Mikrobohrer Spirec Plus 2×d

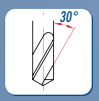
Micro foret Spirec Plus 2×d
Micro punta Spirec Plus 2×d
Micro drill Spirec Plus 2×d

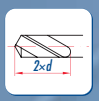
Art. 56030

P1–3 | M1,2 | K1,2 | N1,5–8 | S1 | 01



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | d_1 +0.005 0





In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 161

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.10	0.35	0.55	30	1.50
0.11	0.35	0.55	30	1.50
0.12	0.35	0.55	30	1.50
0.13	0.40	0.60	30	1.50
0.14	0.40	0.60	30	1.50
0.15	0.40	0.60	30	1.50
0.16	0.40	0.60	30	1.50
0.17	0.50	0.70	30	1.50
0.18	0.50	0.70	30	1.50
0.19	0.50	0.70	30	1.50
0.20	0.55	0.75	30	1.50
0.21	0.55	0.75	30	1.50
0.22	0.60	0.80	30	1.50
0.23	0.60	0.80	30	1.50
0.24	0.60	0.80	30	1.50
0.25	0.70	0.90	30	1.50
0.26	0.70	0.90	30	1.50
0.27	0.70	0.90	30	1.50
0.28	0.80	1.00	30	1.50
0.29	0.80	1.00	30	1.50
0.30	0.90	1.20	30	1.50
0.31	0.90	1.20	30	1.50
0.32	0.90	1.20	30	1.50
0.33	0.90	1.20	30	1.50
0.34	0.90	1.35	30	1.50
0.35	0.90	1.35	30	1.50
0.36	0.95	1.35	30	1.50
0.37	0.95	1.35	30	1.50
0.38	0.95	1.50	30	1.50
0.39	0.95	1.50	30	1.50
0.40	0.80	1.60	30	1.50
0.41	0.82	1.60	30	1.50
0.42	0.84	1.60	30	1.50
0.43	0.86	1.60	30	1.50
0.44	0.88	1.60	30	1.50
0.45	0.90	1.60	30	1.50
0.46	0.92	1.70	30	1.50
0.47	0.94	1.70	30	1.50

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.48	0.96	1.70	30	1.50
0.49	0.98	1.70	30	1.50
0.50	1.00	1.70	30	1.50
0.51	1.02	1.80	30	1.50
0.52	1.04	1.80	30	1.50
0.53	1.06	1.80	30	1.50
0.54	1.08	1.80	30	1.50
0.55	1.10	1.80	30	1.50
0.56	1.12	1.90	30	1.50
0.57	1.14	1.90	30	1.50
0.58	1.16	1.90	30	1.50
0.59	1.18	1.90	30	1.50
0.60	1.20	1.90	30	1.50
0.61	1.22	2.00	30	1.50
0.62	1.24	2.00	30	1.50
0.63	1.26	2.00	30	1.50
0.64	1.28	2.00	30	1.50
0.65	1.30	2.00	30	1.50
0.66	1.32	2.10	30	1.50
0.67	1.34	2.10	30	1.50
0.68	1.36	2.10	30	1.50
0.69	1.38	2.10	30	1.50
0.70	1.40	2.10	30	1.50
0.71	1.42	2.20	30	1.50
0.72	1.44	2.20	30	1.50
0.73	1.46	2.20	30	1.50
0.74	1.48	2.20	30	1.50
0.75	1.50	2.20	30	1.50
0.76	1.52	2.30	30	1.50
0.77	1.54	2.30	30	1.50
0.78	1.56	2.30	30	1.50
0.79	1.58	2.30	30	1.50
0.80	1.60	2.30	30	1.50
0.81	1.62	2.40	30	1.50
0.82	1.64	2.40	30	1.50
0.83	1.66	2.40	30	1.50
0.84	1.68	2.40	30	1.50
0.85	1.70	2.40	30	1.50

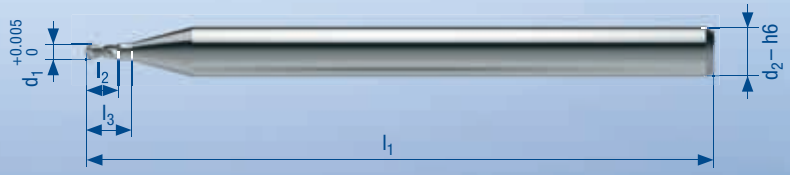
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.86	1.72	2.50	30	1.50
0.87	1.74	2.50	30	1.50
0.88	1.76	2.50	30	1.50
0.89	1.78	2.50	30	1.50
0.90	1.80	2.50	30	1.50
0.91	1.82	2.60	30	1.50
0.92	1.84	2.60	30	1.50
0.93	1.86	2.60	30	1.50
0.94	1.88	2.60	30	1.50
0.95	1.90	2.60	30	1.50
0.96	1.92	2.70	30	1.50
0.97	1.94	2.70	30	1.50
0.98	1.96	2.70	30	1.50
0.99	1.98	2.70	30	1.50
1.00	2.00	2.70	30	1.50

Mikro Pilotbohrer Plus 2×d

Art. 56033

Micro foret de préperçage Plus 2×d
Micro punta per preforo Plus 2×d
Micro pilot drill Plus 2×d

P1–3 | M1,2 | N1,5–8 | S1 | 01



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | d_1 +0.005 0

Vc → S./p. 161

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.03	0.15	0.30	38	3.00
0.04	0.15	0.30	38	3.00
0.05	0.20	0.40	38	3.00
0.06	0.20	0.40	38	3.00
0.07	0.25	0.45	38	3.00
0.08	0.25	0.45	38	3.00
0.09	0.30	0.50	38	3.00
0.10	0.35	0.55	38	3.00
0.11	0.35	0.55	38	3.00
0.12	0.35	0.55	38	3.00
0.13	0.40	0.60	38	3.00
0.14	0.40	0.60	38	3.00
0.15	0.40	0.60	38	3.00
0.16	0.40	0.60	38	3.00
0.17	0.50	0.70	38	3.00
0.18	0.50	0.70	38	3.00
0.19	0.50	0.70	38	3.00
0.20	0.55	0.75	38	3.00
0.21	0.55	0.75	38	3.00
0.22	0.60	0.80	38	3.00
0.23	0.60	0.80	38	3.00
0.24	0.60	0.80	38	3.00
0.25	0.70	0.90	38	3.00
0.26	0.70	0.90	38	3.00
0.27	0.70	0.90	38	3.00
0.28	0.80	1.00	38	3.00
0.29	0.80	1.00	38	3.00
0.30	0.90	1.20	38	3.00
0.31	0.90	1.20	38	3.00
0.32	0.90	1.20	38	3.00
0.33	0.90	1.20	38	3.00
0.34	0.90	1.35	38	3.00
0.35	0.90	1.35	38	3.00
0.36	0.95	1.35	38	3.00
0.37	0.95	1.35	38	3.00
0.38	0.95	1.50	38	3.00
0.39	0.95	1.50	38	3.00
0.40	0.80	1.60	38	3.00
0.41	0.82	1.60	38	3.00
0.42	0.84	1.60	38	3.00
0.43	0.86	1.60	38	3.00
0.44	0.88	1.60	38	3.00
0.45	0.90	1.60	38	3.00
0.46	0.92	1.70	38	3.00
0.47	0.94	1.70	38	3.00
0.48	0.96	1.70	38	3.00
0.49	0.98	1.70	38	3.00
0.50	1.00	1.70	38	3.00
0.51	1.02	1.80	38	3.00
0.52	1.04	1.80	38	3.00
0.53	1.06	1.80	38	3.00
0.54	1.08	1.80	38	3.00
0.55	1.10	1.80	38	3.00
0.56	1.12	1.90	38	3.00
0.57	1.14	1.90	38	3.00
0.58	1.16	1.90	38	3.00
0.59	1.18	1.90	38	3.00
0.60	1.20	1.90	38	3.00
0.61	1.22	2.00	38	3.00
0.62	1.24	2.00	38	3.00
0.63	1.26	2.00	38	3.00
0.64	1.28	2.00	38	3.00
0.65	1.30	2.00	38	3.00
0.66	1.32	2.10	38	3.00
0.67	1.34	2.10	38	3.00
0.68	1.36	2.10	38	3.00
0.69	1.38	2.10	38	3.00
0.70	1.40	2.10	38	3.00
0.71	1.42	2.20	38	3.00
0.72	1.44	2.20	38	3.00
0.73	1.46	2.20	38	3.00
0.74	1.48	2.20	38	3.00
0.75	1.50	2.20	38	3.00
0.76	1.52	2.30	38	3.00
0.77	1.54	2.30	38	3.00
0.78	1.56	2.30	38	3.00
0.79	1.58	2.30	38	3.00
0.80	1.60	2.30	38	3.00
0.81	1.62	2.40	38	3.00
0.82	1.64	2.40	38	3.00
0.83	1.66	2.40	38	3.00
0.84	1.68	2.40	38	3.00
0.85	1.70	2.40	38	3.00
0.86	1.72	2.50	38	3.00
0.87	1.74	2.50	38	3.00
0.88	1.76	2.50	38	3.00
0.89	1.78	2.50	38	3.00
0.90	1.80	2.50	38	3.00
0.91	1.82	2.60	38	3.00
0.92	1.84	2.60	38	3.00
0.93	1.86	2.60	38	3.00
0.94	1.88	2.60	38	3.00
0.95	1.90	2.60	38	3.00
0.96	1.92	2.70	38	3.00
0.97	1.94	2.70	38	3.00
0.98	1.96	2.70	38	3.00
0.99	1.98	2.70	38	3.00
1.00	2.00	2.70	38	3.00
1.01	2.02	3.50	38	3.00
1.02	2.04	3.50	38	3.00
1.03	2.06	3.50	38	3.00
1.04	2.08	3.50	38	3.00
1.05	2.10	3.50	38	3.00
1.06	2.12	3.60	38	3.00
1.07	2.14	3.60	38	3.00
1.08	2.16	3.60	38	3.00
1.09	2.18	3.60	38	3.00
1.10	2.20	3.60	38	3.00
1.11	2.22	3.70	38	3.00
1.12	2.24	3.70	38	3.00
1.13	2.26	3.70	38	3.00
1.14	2.28	3.70	38	3.00
1.15	2.30	3.70	38	3.00
1.16	2.32	3.80	38	3.00
1.17	2.34	3.80	38	3.00
1.18	2.36	3.80	38	3.00
1.19	2.38	3.80	38	3.00
1.20	2.40	3.80	38	3.00
1.21	2.42	4.20	38	3.00
1.22	2.44	4.20	38	3.00
1.23	2.46	4.20	38	3.00
1.24	2.48	4.20	38	3.00
1.25	2.50	4.20	38	3.00
1.26	2.52	4.30	38	3.00
1.27	2.54	4.30	38	3.00
1.28	2.56	4.30	38	3.00
1.29	2.58	4.30	38	3.00
1.30	2.60	4.30	38	3.00
1.31	2.62	4.40	38	3.00
1.32	2.64	4.40	38	3.00
1.33	2.66	4.40	38	3.00
1.34	2.68	4.40	38	3.00
1.35	2.70	4.40	38	3.00
1.36	2.72	4.50	38	3.00
1.37	2.74	4.50	38	3.00
1.38	2.76	4.50	38	3.00
1.39	2.78	4.50	38	3.00
1.40	2.80	4.50	38	3.00
1.41	2.82	4.60	38	3.00
1.42	2.84	4.60	38	3.00
1.43	2.86	4.60	38	3.00
1.44	2.88	4.60	38	3.00
1.45	2.90	4.60	38	3.00
1.46	2.92	4.70	38	3.00
1.47	2.94	4.70	38	3.00
1.48	2.96	4.70	38	3.00
1.49	2.98	4.70	38	3.00
1.50	3.00	4.70	38	3.00
1.51	3.02	5.10	38	3.00
1.52	3.04	5.10	38	3.00
1.53	3.06	5.10	38	3.00
1.54	3.08	5.10	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.55	3.10	5.10	38	3.00
1.56	3.12	5.20	38	3.00
1.57	3.14	5.20	38	3.00
1.58	3.16	5.20	38	3.00
1.59	3.18	5.20	38	3.00
1.60	3.20	5.20	38	3.00
1.61	3.22	5.30	38	3.00
1.62	3.24	5.30	38	3.00
1.63	3.26	5.30	38	3.00
1.64	3.28	5.30	38	3.00
1.65	3.30	5.30	38	3.00
1.66	3.32	5.40	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.67	3.34	5.40	38	3.00
1.68	3.36	5.40	38	3.00
1.69	3.38	5.40	38	3.00
1.70	3.40	5.40	38	3.00
1.71	3.42	5.50	38	3.00
1.72	3.44	5.50	38	3.00
1.73	3.46	5.50	38	3.00
1.74	3.48	5.50	38	3.00
1.75	3.50	5.50	38	3.00
1.76	3.52	5.60	38	3.00
1.77	3.54	5.60	38	3.00
1.78	3.56	5.60	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.79	3.58	5.60	38	3.00
1.80	3.60	5.60	38	3.00
1.81	3.62	5.70	38	3.00
1.82	3.64	5.70	38	3.00
1.83	3.66	5.70	38	3.00
1.84	3.68	5.70	38	3.00
1.85	3.70	5.70	38	3.00
1.86	3.72	5.80	38	3.00
1.87	3.74	5.80	38	3.00
1.88	3.76	5.80	38	3.00
1.89	3.78	5.80	38	3.00
1.90	3.80	5.80	38	3.00

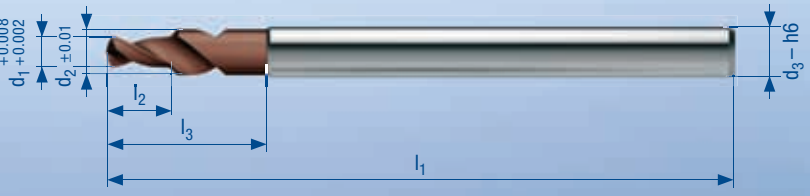
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.91	3.82	5.90	38	3.00
1.92	3.84	5.90	38	3.00
1.93	3.86	5.90	38	3.00
1.94	3.88	5.90	38	3.00
1.95	3.90	5.90	38	3.00
1.96	3.92	6.00	38	3.00
1.97	3.94	6.00	38	3.00
1.98	3.96	6.00	38	3.00
1.99	3.98	6.00	38	3.00
2.00	4.00	6.00	38	3.00

Mikro Pilot-Stufenbohrer Plus

Art. 56036

Micro foret étagé de prépercage Plus
Micro punta a diametri multipli per preforo Plus
Micro pilot step drill Plus

P1–3 | M1,2 | K1,2 | N1–5 | S1 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | AlCrN

Vc → S./p. 161

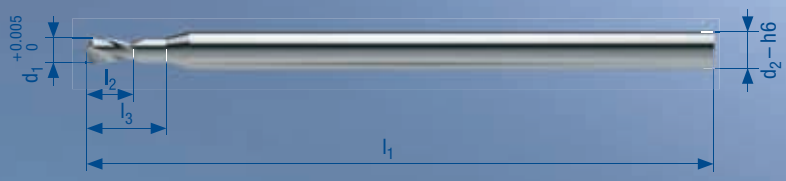
d1 mm	d2 mm	l2 mm	l3 mm	l1 mm	d3 mm
0.40	1.00	0.80	3.00	50	4.00
0.50	1.20	1.00	3.50	50	4.00
0.55	1.30	1.10	3.50	50	4.00
0.60	1.40	1.20	4.30	50	4.00
0.65	1.50	1.30	4.30	50	4.00
0.70	1.80	1.40	5.30	50	4.00
0.75	1.80	1.50	5.30	50	4.00
0.80	2.00	1.60	6.00	50	4.00
0.85	2.00	1.70	6.00	50	4.00
0.90	2.00	1.80	6.00	50	4.00
0.95	2.00	1.90	6.00	50	4.00
1.00	2.20	2.00	7.00	50	4.00
1.05	2.20	2.10	7.00	50	4.00
1.10	2.20	2.20	7.00	50	4.00
1.15	2.20	2.30	7.00	50	4.00
1.20	2.20	2.40	7.00	50	4.00
1.25	2.50	2.50	8.00	50	4.00
1.30	2.50	2.60	8.00	50	4.00
1.35	2.50	2.70	8.00	50	4.00
1.40	2.50	2.80	8.00	50	4.00
1.45	2.70	2.90	9.00	50	4.00
1.50	2.70	3.00	9.00	50	4.00
1.55	2.70	3.10	9.00	50	4.00
1.60	2.70	3.20	9.00	50	4.00
1.65	2.80	3.30	9.50	50	4.00
1.70	2.80	3.40	9.50	50	4.00
1.75	2.80	3.50	9.50	50	4.00
1.80	2.80	3.60	9.50	50	4.00
1.85	3.00	3.70	10.20	50	4.00
1.90	3.00	3.80	10.20	50	4.00
1.95	3.00	3.90	10.20	50	4.00
2.00	3.00	4.00	10.20	50	4.00
2.05	3.20	4.10	11.00	50	4.00
2.10	3.20	4.20	11.00	50	4.00
2.15	3.20	4.30	11.00	50	4.00
2.20	3.20	4.40	11.00	50	4.00

d1 mm	d2 mm	l2 mm	l3 mm	l1 mm	d3 mm
2.25	3.40	4.50	12.00	50	4.00
2.30	3.40	4.60	12.00	50	4.00
2.35	3.40	4.70	12.00	50	4.00
2.40	3.40	4.80	12.00	50	4.00
2.45	3.60	4.90	12.70	50	4.00
2.50	3.60	5.00	12.70	50	4.00
2.55	3.60	5.10	12.70	50	4.00
2.60	3.60	5.20	12.70	50	4.00
2.65	3.80	5.30	13.50	50	4.00
2.70	3.80	5.40	13.50	50	4.00
2.75	3.80	5.50	13.50	50	4.00
2.80	3.80	5.60	13.50	50	4.00
2.85	4.00	5.70	14.10	50	4.00
2.90	4.00	5.80	14.10	50	4.00
2.95	4.00	5.90	14.10	50	4.00
3.00	4.00	6.00	14.10	50	4.00

Mikro Pilotbohrer Spirec Plus aus HSS-E Art. 16004

Micro foret de préperçage Spirec Plus en HSS-E
Micro punta per preforo Spirec Plus in HSS-E
Micro Pilot drill Spirec Plus in HSS-E

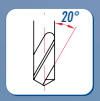
P1,2 | M1,2 | K1,2 | N1,2,5

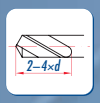


HSS-E Co 8% | SPHINX NORM

d_1 + 0.005 0

Z 2





In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 162

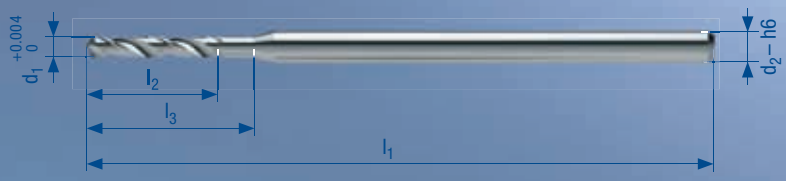
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.10	0.40	0.60	25	1.50
0.15	0.40	0.60	25	1.50
0.20	0.60	0.90	25	1.50
0.25	0.60	0.90	25	1.50
0.30	0.90	1.20	25	1.50
0.35	0.90	1.20	25	1.50
0.40	0.90	1.60	25	1.50
0.45	0.90	1.60	25	1.50
0.50	1.00	1.80	25	1.50
0.55	1.00	1.80	25	1.50
0.60	1.20	2.00	25	1.50
0.65	1.20	2.00	25	1.50
0.70	1.50	2.50	25	1.50
0.75	1.50	2.50	25	1.50
0.80	1.50	2.50	25	1.50
0.85	1.50	2.50	25	1.50
0.90	1.60	2.60	25	1.50
0.95	1.60	2.60	25	1.50
1.00	2.00	3.20	25	1.50
1.05	2.00	3.20	25	1.50
1.10	2.30	3.50	25	1.50
1.15	2.30	3.50	25	1.50
1.20	2.30	3.50	25	1.50
1.25	2.30	3.50	25	1.50
1.30	2.70	4.20	25	1.50
1.35	2.70	4.20	25	1.50
1.40	2.70	4.20	25	1.50
1.45	2.70	4.20	25	1.50
1.50	3.00	4.20	25	1.50

Mikrobohrer Spirec Plus 6 × d

Micro foret Spirec Plus 6 × d
Micro punta Spirec Plus 6 × d
Micro drill Spirec Plus 6 × d

Art. 50695

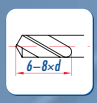
P1–3 | M1 | K1,2 | N2–5 | N7,8



VHM MD/SC | SPHINX NORM

d_1 + 0.004 0

Z 2



In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 162

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	1.50	1.80	30	1.00
0.21	1.50	1.80	30	1.00
0.22	1.50	1.80	30	1.00
0.23	1.50	1.80	30	1.00
0.24	1.50	1.80	30	1.00
0.25	1.90	2.20	30	1.00
0.26	1.90	2.20	30	1.00
0.27	1.90	2.20	30	1.00
0.28	1.90	2.20	30	1.00
0.29	1.90	2.20	30	1.00
0.30	1.90	2.20	30	1.00
0.31	2.40	2.80	30	1.00
0.32	2.40	2.80	30	1.00
0.33	2.40	2.80	30	1.00
0.34	2.40	2.80	30	1.00
0.35	2.40	2.80	30	1.00
0.36	2.40	2.80	30	1.00
0.37	2.40	2.80	30	1.00
0.38	2.40	2.80	30	1.00
0.39	2.70	3.60	30	1.00
0.40	2.70	3.60	30	1.00
0.41	2.70	3.60	30	1.00
0.42	2.70	3.60	30	1.00
0.43	2.70	3.60	30	1.00
0.44	2.70	3.60	30	1.00
0.45	2.70	3.60	30	1.00
0.46	2.70	3.60	30	1.00
0.47	2.70	3.60	30	1.00
0.48	2.70	3.60	30	1.00
0.49	3.20	4.00	30	1.00
0.50	3.20	4.00	30	1.00
0.51	3.20	4.00	30	1.00
0.52	3.20	4.00	30	1.00
0.53	3.20	4.00	30	1.00
0.54	3.60	4.50	30	1.00
0.55	3.60	4.50	30	1.00
0.56	3.60	4.50	30	1.00
0.57	3.60	4.50	30	1.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.58	3.60	4.50	30	1.00
0.59	3.60	4.50	30	1.00
0.60	3.60	4.50	30	1.00
0.61	3.90	5.00	30	1.00
0.62	3.90	5.00	30	1.00
0.63	3.90	5.00	30	1.00
0.64	3.90	5.00	30	1.00
0.65	3.90	5.00	30	1.00
0.66	3.90	5.00	30	1.00
0.67	3.90	5.00	30	1.00
0.68	4.50	5.60	30	1.00
0.69	4.50	5.60	30	1.00
0.70	4.50	5.60	30	1.00
0.71	4.50	5.60	30	1.00
0.72	4.50	5.60	30	1.00
0.73	4.50	5.60	30	1.00
0.74	4.50	5.60	30	1.00
0.75	4.50	5.60	30	1.00
0.76	5.00	6.30	30	1.00
0.77	5.00	6.30	30	1.00
0.78	5.00	6.30	30	1.00
0.79	5.00	6.30	30	1.00
0.80	5.00	6.30	30	1.50
0.81	5.00	6.30	30	1.50
0.82	5.00	6.30	30	1.50
0.83	5.00	6.30	30	1.50
0.84	5.00	6.30	30	1.50
0.85	5.00	6.30	30	1.50
0.86	5.70	7.10	30	1.50
0.87	5.70	7.10	30	1.50
0.88	5.70	7.10	30	1.50
0.89	5.70	7.10	30	1.50
0.90	5.70	7.10	30	1.50
0.91	5.70	7.10	30	1.50
0.92	5.70	7.10	30	1.50
0.93	5.70	7.10	30	1.50
0.94	5.70	7.10	30	1.50
0.95	5.70	7.10	30	1.50

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.96	6.50	8.00	30	1.50
0.97	6.50	8.00	30	1.50
0.98	6.50	8.00	30	1.50
0.99	6.50	8.00	30	1.50
1.00	6.50	8.00	30	1.50
1.01	6.50	8.00	30	1.50
1.02	6.50	8.00	30	1.50
1.03	6.50	8.00	30	1.50
1.04	6.50	8.00	30	1.50
1.05	6.50	8.00	30	1.50
1.06	7.30	9.00	30	1.50
1.07	7.30	9.00	30	1.50
1.08	7.30	9.00	30	1.50
1.09	7.30	9.00	30	1.50
1.10	7.30	9.00	30	1.50
1.11	7.30	9.00	30	1.50
1.12	7.30	9.00	30	1.50
1.13	7.30	9.00	30	1.50
1.14	7.30	9.00	30	1.50
1.15	7.30	9.00	30	1.50
1.16	8.20	10.00	30	1.50
1.17	8.20	10.00	30	1.50
1.18	8.20	10.00	30	1.50
1.19	8.20	10.00	30	1.50
1.20	8.20	10.00	30	1.50
1.21	8.20	10.00	30	1.50
1.22	8.20	10.00	30	1.50
1.23	8.20	10.00	30	1.50
1.24	8.20	10.00	30	1.50
1.25	8.20	10.00	30	1.50
1.26	8.20	10.00	30	1.50
1.27	8.20	10.00	30	1.50
1.28	8.20	10.00	30	1.50
1.29	8.20	10.00	30	1.50
1.30	8.20	10.00	30	1.50
1.31	9.20	11.20	30	1.50
1.32	9.20	11.20	30	1.50
1.33	9.20	11.20	30	1.50

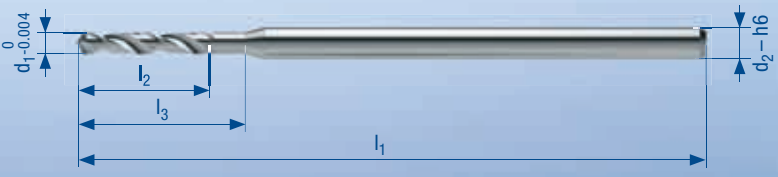
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.34	9.20	11.20	30	1.50
1.35	9.20	11.20	30	1.50
1.36	9.20	11.20	30	1.50
1.37	9.20	11.20	30	1.50
1.38	9.20	11.20	30	1.50
1.39	9.20	11.20	30	1.50
1.40	9.20	11.20	30	1.50
1.41	9.20	11.20	30	1.50
1.42	9.20	11.20	30	1.50
1.43	9.20	11.20	30	1.50
1.44	9.20	11.20	30	1.50
1.45	9.20	11.20	30	1.50
1.46	9.20	11.20	30	1.50
1.47	9.20	11.20	30	1.50
1.48	9.20	11.20	30	1.50
1.49	9.20	11.20	30	1.50
1.50	9.20	11.20	30	1.50

Mikrobohrer Spirec 6 × d

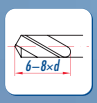
Art. 50699

Micro foret Spirec 6 × d
Micro punta Spirec 6 × d
Micro drill Spirec 6 × d

P1–3 | M1 | K1,2 | N2–5 | N7,8



VHM MD/SC | DIN 1899-A | Typ N | Z 2



In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 162

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.05	0.40	0.60	25	1.00
0.06	0.40	0.60	25	1.00
0.07	0.50	0.70	25	1.00
0.08	0.50	0.70	25	1.00
0.09	0.50	0.70	25	1.00
0.10	0.50	0.70	25	1.00
0.11	0.50	0.70	25	1.00
0.12	0.50	0.70	25	1.00
0.13	0.80	1.00	25	1.00
0.14	0.80	1.00	25	1.00
0.15	0.80	1.00	25	1.00
0.16	1.10	1.40	25	1.00
0.17	1.10	1.40	25	1.00
0.18	1.10	1.40	25	1.00
0.19	1.10	1.40	25	1.00
0.20	1.50	1.80	25	1.00
0.21	1.50	1.80	25	1.00
0.22	1.50	1.80	25	1.00
0.23	1.50	1.80	25	1.00
0.24	1.50	1.80	25	1.00
0.25	1.90	2.20	25	1.00
0.26	1.90	2.20	25	1.00
0.27	1.90	2.20	25	1.00
0.28	1.90	2.20	25	1.00
0.29	1.90	2.20	25	1.00
0.30	1.90	2.20	25	1.00
0.31	2.40	2.80	25	1.00
0.32	2.40	2.80	25	1.00
0.33	2.40	2.80	25	1.00
0.34	2.40	2.80	25	1.00
0.35	2.40	2.80	25	1.00
0.36	2.40	2.80	25	1.00
0.37	2.40	2.80	25	1.00
0.38	2.40	2.80	25	1.00
0.39	2.70	3.60	25	1.00
0.40	2.70	3.60	25	1.00
0.41	2.70	3.60	25	1.00
0.42	2.70	3.60	25	1.00
0.43	2.70	3.60	25	1.00
0.44	2.70	3.60	25	1.00
0.45	2.70	3.60	25	1.00
0.46	2.70	3.60	25	1.00
0.47	2.70	3.60	25	1.00
0.48	2.70	3.60	25	1.00
0.49	3.20	4.00	25	1.00
0.50	3.20	4.00	25	1.00
0.51	3.20	4.00	25	1.00
0.52	3.20	4.00	25	1.00
0.53	3.20	4.00	25	1.00
0.54	3.60	4.50	25	1.00
0.55	3.60	4.50	25	1.00
0.56	3.60	4.50	25	1.00
0.57	3.60	4.50	25	1.00
0.58	3.60	4.50	25	1.00
0.59	3.60	4.50	25	1.00
0.60	3.60	4.50	25	1.00
0.61	3.90	5.00	25	1.00
0.62	3.90	5.00	25	1.00
0.63	3.90	5.00	25	1.00
0.64	3.90	5.00	25	1.00
0.65	3.90	5.00	25	1.00
0.66	3.90	5.00	25	1.00
0.67	3.90	5.00	25	1.00
0.68	4.50	5.60	25	1.00
0.69	4.50	5.60	25	1.00
0.70	4.50	5.60	25	1.00
0.71	4.50	5.60	25	1.00
0.72	4.50	5.60	25	1.00
0.73	4.50	5.60	25	1.00
0.74	4.50	5.60	25	1.00
0.75	4.50	5.60	25	1.00
0.76	5.00	6.30	25	1.00
0.77	5.00	6.30	25	1.00
0.78	5.00	6.30	25	1.00
0.79	5.00	6.30	25	1.00
0.80	5.00	6.30	25	1.50
0.81	5.00	6.30	25	1.50
0.82	5.00	6.30	25	1.50
0.83	5.00	6.30	25	1.50
0.84	5.00	6.30	25	1.50
0.85	5.00	6.30	25	1.50
0.86	5.70	7.10	25	1.50
0.87	5.70	7.10	25	1.50
0.88	5.70	7.10	25	1.50
0.89	5.70	7.10	25	1.50
0.90	5.70	7.10	25	1.50
0.91	5.70	7.10	25	1.50
0.92	5.70	7.10	25	1.50
0.93	5.70	7.10	25	1.50
0.94	5.70	7.10	25	1.50
0.95	5.70	7.10	25	1.50
0.96	6.50	8.00	25	1.50
0.97	6.50	8.00	25	1.50
0.98	6.50	8.00	25	1.50
0.99	6.50	8.00	25	1.50
1.00	6.50	8.00	25	1.50
1.01	6.50	8.00	25	1.50
1.02	6.50	8.00	25	1.50
1.03	6.50	8.00	25	1.50
1.04	6.50	8.00	25	1.50
1.05	6.50	8.00	25	1.50
1.06	7.30	9.00	25	1.50
1.07	7.30	9.00	25	1.50
1.08	7.30	9.00	25	1.50
1.09	7.30	9.00	25	1.50
1.10	7.30	9.00	25	1.50
1.11	7.30	9.00	25	1.50
1.12	7.30	9.00	25	1.50
1.13	7.30	9.00	25	1.50
1.14	7.30	9.00	25	1.50
1.15	7.30	9.00	25	1.50
1.16	8.20	10.00	25	1.50
1.17	8.20	10.00	25	1.50
1.18	8.20	10.00	25	1.50
1.19	8.20	10.00	25	1.50
1.20	8.20	10.00	25	1.50
1.21	8.20	10.00	25	1.50
1.22	8.20	10.00	25	1.50
1.23	8.20	10.00	25	1.50
1.24	8.20	10.00	25	1.50
1.25	8.20	10.00	25	1.50
1.26	8.20	10.00	25	1.50
1.27	8.20	10.00	25	1.50
1.28	8.20	10.00	25	1.50
1.29	8.20	10.00	25	1.50
1.30	8.20	10.00	25	1.50
1.31	9.20	11.20	25	1.50
1.32	9.20	11.20	25	1.50
1.33	9.20	11.20	25	1.50
1.34	9.20	11.20	25	1.50
1.35	9.20	11.20	25	1.50
1.36	9.20	11.20	25	1.50
1.37	9.20	11.20	25	1.50
1.38	9.20	11.20	25	1.50
1.39	9.20	11.20	25	1.50
1.40	9.20	11.20	25	1.50
1.41	9.20	11.20	25	1.50
1.42	9.20	11.20	25	1.50
1.43	9.20	11.20	25	1.50
1.44	9.20	11.20	25	1.50
1.45	9.20	11.20	25	1.50
1.46	9.20	11.20	25	1.50
1.47	9.20	11.20	25	1.50
1.48	9.20	11.20	25	1.50
1.49	9.20	11.20	25	1.50
1.50	9.20	11.20	25	1.50
1.51	11.20	13.40	38	2.00
1.52	11.20	13.40	38	2.00
1.53	11.20	13.40	38	2.00
1.54	11.20	13.40	38	2.00
1.55	11.20	13.40	38	2.00
1.56	11.20	13.40	38	2.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.57	11.20	13.40	38	2.00
1.58	11.20	13.40	38	2.00
1.59	11.20	13.40	38	2.00
1.60	11.20	13.40	38	2.00
1.61	11.20	13.40	38	2.00
1.62	11.20	13.40	38	2.00
1.63	11.20	13.40	38	2.00
1.64	11.20	13.40	38	2.00
1.65	11.20	13.40	38	2.00
1.66	11.20	13.40	38	2.00
1.67	11.20	13.40	38	2.00
1.68	11.20	13.40	38	2.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.69	11.20	13.40	38	2.00
1.70	11.20	13.40	38	2.00
1.71	11.20	13.40	38	2.00
1.72	11.20	13.40	38	2.00
1.73	11.20	13.40	38	2.00
1.74	11.20	13.40	38	2.00
1.75	11.20	13.40	38	2.00
1.76	11.20	13.40	38	2.00
1.77	11.20	13.40	38	2.00
1.78	11.20	13.40	38	2.00
1.79	11.20	13.40	38	2.00
1.80	11.20	13.40	38	2.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.81	11.20	13.40	38	2.00
1.82	11.20	13.40	38	2.00
1.83	11.20	13.40	38	2.00
1.84	11.20	13.40	38	2.00
1.85	11.20	13.40	38	2.00
1.86	11.20	13.40	38	2.00
1.87	11.20	13.40	38	2.00
1.88	11.20	13.40	38	2.00
1.89	11.20	13.40	38	2.00
1.90	11.20	13.40	38	2.00
1.91	11.20	13.40	38	2.00
1.92	11.20	13.40	38	2.00

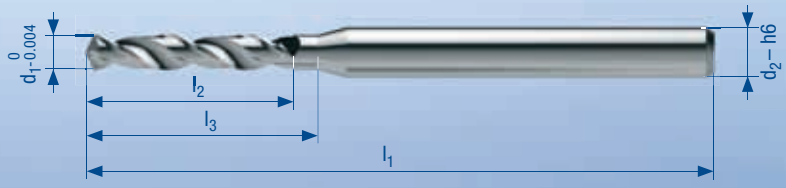
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.93	11.20	13.40	38	2.00
1.94	11.20	13.40	38	2.00
1.95	11.20	13.40	38	2.00
1.96	11.20	13.40	38	2.00
1.97	11.20	13.40	38	2.00
1.98	11.20	13.40	38	2.00
1.99	11.20	13.40	38	2.00
2.00	11.20	13.40	38	2.00

Mikrobohrer 6 × d

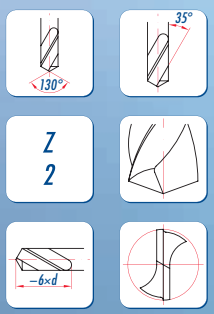
Micro foret 6 × d
Micro punta 6 × d
Micro drill 6 × d

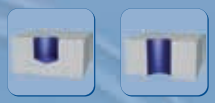
Art. 51200

P1–3 | M1,2 | K1,2 | N1,5–8 | S1 | 01



VHM MD/SC | SPHINX NORM





Vc → S./p. 163

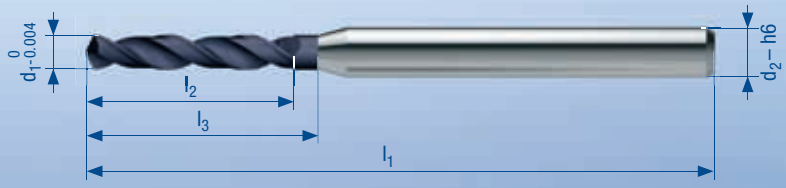
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.03	0.25	0.35	38	3.00
0.04	0.30	0.40	38	3.00
0.05	0.35	0.45	38	3.00
0.06	0.40	0.50	38	3.00
0.07	0.45	0.60	38	3.00
0.08	0.50	0.70	38	3.00
0.09	0.50	0.70	38	3.00
0.10	0.50	0.70	38	3.00
0.11	0.50	0.70	38	3.00
0.12	0.50	0.70	38	3.00
0.13	0.80	1.00	38	3.00
0.14	0.80	1.00	38	3.00
0.15	0.80	1.00	38	3.00
0.16	1.10	1.40	38	3.00
0.17	1.10	1.40	38	3.00
0.18	1.10	1.40	38	3.00
0.19	1.10	1.40	38	3.00
0.20	1.50	1.80	38	3.00
0.21	1.50	1.80	38	3.00
0.22	1.50	1.80	38	3.00
0.23	1.50	1.80	38	3.00
0.24	1.50	1.80	38	3.00
0.25	1.90	2.20	38	3.00
0.26	1.90	2.20	38	3.00
0.27	1.90	2.20	38	3.00
0.28	1.90	2.20	38	3.00
0.29	1.90	2.20	38	3.00
0.30	1.80	2.40	38	3.00
0.31	1.80	2.40	38	3.00
0.32	1.80	2.40	38	3.00
0.33	1.80	2.40	38	3.00
0.34	1.80	2.40	38	3.00
0.35	2.20	2.80	38	3.00
0.36	2.20	2.80	38	3.00
0.37	2.20	2.80	38	3.00
0.38	2.20	2.80	38	3.00
0.39	2.70	3.60	38	3.00
0.40	2.70	3.60	38	3.00
0.41	2.70	3.60	38	3.00
0.42	2.70	3.60	38	3.00
0.43	2.70	3.60	38	3.00
0.44	2.70	3.60	38	3.00
0.45	2.70	3.60	38	3.00
0.46	2.70	3.60	38	3.00
0.47	2.70	3.60	38	3.00
0.48	2.70	3.60	38	3.00
0.49	3.20	4.00	38	3.00
0.50	3.20	4.00	38	3.00
0.51	3.20	4.00	38	3.00
0.52	3.20	4.00	38	3.00
0.53	3.20	4.00	38	3.00
0.54	3.60	4.50	38	3.00
0.55	3.60	4.50	38	3.00
0.56	3.60	4.50	38	3.00
0.57	3.60	4.50	38	3.00
0.58	3.60	4.50	38	3.00
0.59	3.60	4.50	38	3.00
0.60	3.60	4.50	38	3.00
0.61	3.90	5.00	38	3.00
0.62	3.90	5.00	38	3.00
0.63	3.90	5.00	38	3.00
0.64	3.90	5.00	38	3.00
0.65	3.90	5.00	38	3.00
0.66	3.90	5.00	38	3.00
0.67	3.90	5.00	38	3.00
0.68	4.50	5.60	38	3.00
0.69	4.50	5.60	38	3.00
0.70	4.50	5.60	38	3.00
0.71	4.50	5.60	38	3.00
0.72	4.50	5.60	38	3.00
0.73	4.50	5.60	38	3.00
0.74	4.50	5.60	38	3.00
0.75	4.50	5.60	38	3.00
0.76	5.00	6.30	38	3.00
0.77	5.00	6.30	38	3.00
0.78	5.00	6.30	38	3.00
0.79	5.00	6.30	38	3.00
0.80	5.00	6.30	38	3.00
0.81	5.00	6.30	38	3.00
0.82	5.00	6.30	38	3.00
0.83	5.00	6.30	38	3.00
0.84	5.00	6.30	38	3.00
0.85	5.00	6.30	38	3.00
0.86	5.70	7.10	38	3.00
0.87	5.70	7.10	38	3.00
0.88	5.70	7.10	38	3.00
0.89	5.70	7.10	38	3.00
0.90	5.70	7.10	38	3.00
0.91	5.70	7.10	38	3.00
0.92	5.70	7.10	38	3.00
0.93	5.70	7.10	38	3.00
0.94	5.70	7.10	38	3.00
0.95	5.70	7.10	38	3.00
0.96	6.50	8.00	38	3.00
0.97	6.50	8.00	38	3.00
0.98	6.50	8.00	38	3.00
0.99	6.50	8.00	38	3.00
1.00	6.50	8.00	38	3.00
1.01	6.50	8.00	38	3.00
1.02	6.50	8.00	38	3.00
1.03	6.50	8.00	38	3.00
1.04	6.50	8.00	38	3.00
1.05	6.50	8.00	38	3.00
1.06	7.30	9.00	38	3.00
1.07	7.30	9.00	38	3.00
1.08	7.30	9.00	38	3.00
1.09	7.30	9.00	38	3.00
1.10	7.30	9.00	38	3.00
1.11	7.30	9.00	38	3.00
1.12	7.30	9.00	38	3.00
1.13	7.30	9.00	38	3.00
1.14	7.30	9.00	38	3.00
1.15	7.30	9.00	38	3.00
1.16	8.20	10.00	38	3.00
1.17	8.20	10.00	38	3.00
1.18	8.20	10.00	38	3.00
1.19	8.20	10.00	38	3.00
1.20	8.20	10.00	38	3.00
1.21	8.20	10.00	38	3.00
1.22	8.20	10.00	38	3.00
1.23	8.20	10.00	38	3.00
1.24	8.20	10.00	38	3.00
1.25	8.20	10.00	38	3.00
1.26	8.20	10.00	38	3.00
1.27	8.20	10.00	38	3.00
1.28	8.20	10.00	38	3.00
1.29	8.20	10.00	38	3.00
1.30	8.20	10.00	38	3.00
1.31	9.20	11.20	38	3.00
1.32	9.20	11.20	38	3.00
1.33	9.20	11.20	38	3.00
1.34	9.20	11.20	38	3.00
1.35	9.20	11.20	38	3.00
1.36	9.20	11.20	38	3.00
1.37	9.20	11.20	38	3.00
1.38	9.20	11.20	38	3.00
1.39	9.20	11.20	38	3.00
1.40	9.20	11.20	38	3.00
1.41	9.20	11.20	38	3.00
1.42	9.20	11.20	38	3.00
1.43	9.20	11.20	38	3.00
1.44	9.20	11.20	38	3.00
1.45	9.20	11.20	38	3.00
1.46	9.20	11.20	38	3.00
1.47	9.20	11.20	38	3.00
1.48	9.20	11.20	38	3.00
1.49	9.20	11.20	38	3.00
1.50	9.20	11.20	38	3.00
1.51	11.20	13.40	38	3.00
1.52	11.20	13.40	38	3.00
1.53	11.20	13.40	38	3.00
1.54	11.20	13.40	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.55	11.20	13.40	38	3.00
1.56	11.20	13.40	38	3.00
1.57	11.20	13.40	38	3.00
1.58	11.20	13.40	38	3.00
1.59	11.20	13.40	38	3.00
1.60	11.20	13.40	38	3.00
1.61	11.20	13.40	38	3.00
1.62	11.20	13.40	38	3.00
1.63	11.20	13.40	38	3.00
1.64	11.20	13.40	38	3.00
1.65	11.20	13.40	38	3.00
1.66	11.20	13.40	38	3.00
1.67	11.20	13.40	38	3.00
1.68	11.20	13.40	38	3.00
1.69	11.20	13.40	38	3.00
1.70	11.20	13.40	38	3.00
1.71	11.20	13.40	38	3.00
1.72	11.20	13.40	38	3.00
1.73	11.20	13.40	38	3.00
1.74	11.20	13.40	38	3.00
1.75	11.20	13.40	38	3.00
1.76	11.20	13.40	38	3.00
1.77	11.20	13.40	38	3.00
1.78	11.20	13.40	38	3.00
1.79	11.20	13.40	38	3.00
1.80	11.20	13.40	38	3.00
1.81	11.20	13.40	38	3.00
1.82	11.20	13.40	38	3.00
1.83	11.20	13.40	38	3.00
1.84	11.20	13.40	38	3.00
1.85	11.20	13.40	38	3.00
1.86	11.20	13.40	38	3.00
1.87	11.20	13.40	38	3.00
1.88	11.20	13.40	38	3.00
1.89	11.20	13.40	38	3.00
1.90	11.20	13.40	38	3.00
1.91	11.20	13.40	38	3.00
1.92	11.20	13.40	38	3.00
1.93	11.20	13.40	38	3.00
1.94	11.20	13.40	38	3.00
1.95	11.20	13.40	38	3.00
1.96	11.20	13.40	38	3.00
1.97	11.20	13.40	38	3.00
1.98	11.20	13.40	38	3.00
1.99	11.20	13.40	38	3.00
2.00	11.20	13.40	38	3.00
2.01	12.50	14.00	38	3.00
2.02	12.50	14.00	38	3.00
2.03	12.50	14.00	38	3.00
2.04	12.50	14.00	38	3.00
2.05	12.50	14.00	38	3.00
2.06	12.50	14.00	38	3.00
2.07	12.50	14.00	38	3.00
2.08	12.50	14.00	38	3.00
2.09	12.50	14.00	38	3.00
2.10	12.50	14.00	38	3.00
2.11	12.50	14.00	38	3.00
2.12	12.50	14.00	38	3.00
2.13	12.50	14.00	38	3.00
2.14	12.50	14.00	38	3.00
2.15	12.50	14.00	38	3.00
2.16	12.50	14.00	38	3.00
2.17	12.50	14.00	38	3.00
2.18	12.50	14.00	38	3.00
2.19	12.50	14.00	38	3.00
2.20	12.50	14.00	38	3.00
2.21	12.50	14.00	38	3.00
2.22	12.50	14.00	38	3.00
2.23	12.50	14.00	38	3.00
2.24	12.50	14.00	38	3.00
2.25	12.50	14.00	38	3.00
2.26	12.50	14.00	38	3.00
2.27	12.50	14.00	38	3.00
2.28	12.50	14.00	38	3.00
2.29	12.50	14.00	38	3.00
2.30	12.50	14.00	38	3.00
2.31	12.50	14.00	38	3.00
2.32	12.50	14.00	38	3.00
2.33	12.50	14.00	38	3.00
2.34	12.50	14.00	38	3.00
2.35	12.50	14.00	38	3.00
2.36	12.50	14.00	38	3.00
2.37	12.50	14.00	38	3.00
2.38	12.50	14.00	38	3.00
2.39	12.50	14.00	38	3.00
2.40	12.50	14.00	38	3.00
2.41	12.50	14.00	38	3.00
2.42	12.50	14.00	38	3.00
2.43	12.50	14.00	38	3.00
2.44	12.50	14.00	38	3.00
2.45	12.50	14.00	38	3.00
2.46	12.50	14.00	38	3.00
2.47	12.50	14.00	38	3.00
2.48	12.50	14.00	38	3.00
2.49	12.50	14.00	38	3.00
2.50	14.00	17.00	38	3.00
2.51	14.00	17.00	38	3.00
2.52	14.00	17.00	38	3.00
2.53	14.00	17.00	38	3.00
2.54	14.00	17.00	38	3.00
2.55	14.00	17.00	38	3.00
2.56	14.00	17.00	38	3.00
2.57	14.00	17.00	38	3.00
2.58	14.00	17.00	38	3.00
2.59	14.00	17.00	38	3.00
2.60	14.00	17.00	38	3.00
2.61	14.00	17.00	38	3.00
2.62	14.00	17.00	38	3.00
2.63	14.00	17.00	38	3.00
2.64	14.00	17.00	38	3.00
2.65	14.00	17.00	38	3.00
2.66	14.00	17.00	38	3.00
2.67	14.00	17.00	38	3.00
2.68	14.00	17.00	38	3.00
2.69	14.00	17.00	38	3.00
2.70	14.00	17.00	38	3.00
2.71	14.00	17.00	38	3.00
2.72	14.00	17.00	38	3.00
2.73	14.00	17.00	38	3.00
2.74	14.00	17.00	38	3.00
2.75	14.00	17.00	38	3.00
2.76	14.00	17.00	38	3.00
2.77	14.00	17.00	38	3.00
2.78	14.00	17.00	38	3.00
2.79	14.00	17.00	38	3.00
2.80	14.00	17.00	38	3.00
2.81	14.00	17.00	38	3.00
2.82	14.00	17.00	38	3.00
2.83	14.00	17.00	38	3.00
2.84	14.00	17.00	38	3.00
2.85	14.00	17.00	38	3.00
2.86	14.00	17.00	38	3.00
2.87	14.00	17.00	38	3.00
2.88	14.00	17.00	38	3.00
2.89	14.00	17.00	38	3.00
2.90	14.00	17.00	38	3.00
2.91	14.00	17.00	38	3.00
2.92	14.00	17.00	38	3.00
2.93	14.00	17.00	38	3.00
2.94	14.00	17.00	38	3.00
2.95	14.00	17.00	38	3.00
2.96	14.00	17.00	38	3.00
2.97	14.00	17.00	38	3.00
2.98	14.00	17.00	38	3.00
2.99	14.00	17.00	38	3.00
3.00	14.00	17.00	38	3.00

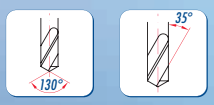
Mikrobohrer 6 × d
Micro foret 6 × d
Micro punta 6 × d
Micro drill 6 × d

Art. 51201

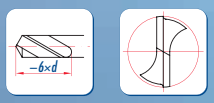
P1–3 | M1,2 | K1,2 | N1,5–8 | S1 | H1 | O1,2



VHM MD/SC | SPHINX NORM



Z 2



TiAlN

Vc → S./p. 163

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	1.50	1.80	38	3.00
0.21	1.50	1.80	38	3.00
0.22	1.50	1.80	38	3.00
0.23	1.50	1.80	38	3.00
0.24	1.50	1.80	38	3.00
0.25	1.90	2.20	38	3.00
0.26	1.90	2.20	38	3.00
0.27	1.90	2.20	38	3.00
0.28	1.90	2.20	38	3.00
0.29	1.90	2.20	38	3.00
0.30	1.80	2.40	38	3.00
0.31	1.80	2.40	38	3.00
0.32	1.80	2.40	38	3.00
0.33	1.80	2.40	38	3.00
0.34	1.80	2.40	38	3.00
0.35	2.20	2.80	38	3.00
0.36	2.20	2.80	38	3.00
0.37	2.20	2.80	38	3.00
0.38	2.20	2.80	38	3.00
0.39	2.70	3.60	38	3.00
0.40	2.70	3.60	38	3.00
0.41	2.70	3.60	38	3.00
0.42	2.70	3.60	38	3.00
0.43	2.70	3.60	38	3.00
0.44	2.70	3.60	38	3.00
0.45	2.70	3.60	38	3.00
0.46	2.70	3.60	38	3.00
0.47	2.70	3.60	38	3.00
0.48	2.70	3.60	38	3.00
0.49	3.20	4.00	38	3.00
0.50	3.20	4.00	38	3.00
0.51	3.20	4.00	38	3.00
0.52	3.20	4.00	38	3.00
0.53	3.20	4.00	38	3.00
0.54	3.60	4.50	38	3.00
0.55	3.60	4.50	38	3.00
0.56	3.60	4.50	38	3.00
0.57	3.60	4.50	38	3.00
0.58	3.60	4.50	38	3.00
0.59	3.60	4.50	38	3.00
0.60	3.60	4.50	38	3.00
0.61	3.90	5.00	38	3.00
0.62	3.90	5.00	38	3.00
0.63	3.90	5.00	38	3.00
0.64	3.90	5.00	38	3.00
0.65	3.90	5.00	38	3.00
0.66	3.90	5.00	38	3.00
0.67	3.90	5.00	38	3.00
0.68	4.50	5.60	38	3.00
0.69	4.50	5.60	38	3.00
0.70	4.50	5.60	38	3.00
0.71	4.50	5.60	38	3.00
0.72	4.50	5.60	38	3.00
0.73	4.50	5.60	38	3.00
0.74	4.50	5.60	38	3.00
0.75	4.50	5.60	38	3.00
0.76	5.00	6.30	38	3.00
0.77	5.00	6.30	38	3.00
0.78	5.00	6.30	38	3.00
0.79	5.00	6.30	38	3.00
0.80	5.00	6.30	38	3.00
0.81	5.00	6.30	38	3.00
0.82	5.00	6.30	38	3.00
0.83	5.00	6.30	38	3.00
0.84	5.00	6.30	38	3.00
0.85	5.00	6.30	38	3.00
0.86	5.70	7.10	38	3.00
0.87	5.70	7.10	38	3.00
0.88	5.70	7.10	38	3.00
0.89	5.70	7.10	38	3.00
0.90	5.70	7.10	38	3.00
0.91	5.70	7.10	38	3.00
0.92	5.70	7.10	38	3.00
0.93	5.70	7.10	38	3.00
0.94	5.70	7.10	38	3.00
0.95	5.70	7.10	38	3.00
0.96	6.50	8.00	38	3.00
0.97	6.50	8.00	38	3.00
0.98	6.50	8.00	38	3.00
0.99	6.50	8.00	38	3.00
1.00	6.50	8.00	38	3.00
1.01	6.50	8.00	38	3.00
1.02	6.50	8.00	38	3.00
1.03	6.50	8.00	38	3.00
1.04	6.50	8.00	38	3.00
1.05	6.50	8.00	38	3.00
1.06	7.30	9.00	38	3.00
1.07	7.30	9.00	38	3.00
1.08	7.30	9.00	38	3.00
1.09	7.30	9.00	38	3.00
1.10	7.30	9.00	38	3.00
1.11	7.30	9.00	38	3.00
1.12	7.30	9.00	38	3.00
1.13	7.30	9.00	38	3.00
1.14	7.30	9.00	38	3.00
1.15	7.30	9.00	38	3.00
1.16	8.20	10.00	38	3.00
1.17	8.20	10.00	38	3.00
1.18	8.20	10.00	38	3.00
1.19	8.20	10.00	38	3.00
1.20	8.20	10.00	38	3.00
1.21	8.20	10.00	38	3.00
1.22	8.20	10.00	38	3.00
1.23	8.20	10.00	38	3.00
1.24	8.20	10.00	38	3.00
1.25	8.20	10.00	38	3.00
1.26	8.20	10.00	38	3.00
1.27	8.20	10.00	38	3.00
1.28	8.20	10.00	38	3.00
1.29	8.20	10.00	38	3.00
1.30	8.20	10.00	38	3.00
1.31	9.20	11.20	38	3.00
1.32	9.20	11.20	38	3.00
1.33	9.20	11.20	38	3.00
1.34	9.20	11.20	38	3.00
1.35	9.20	11.20	38	3.00
1.36	9.20	11.20	38	3.00
1.37	9.20	11.20	38	3.00
1.38	9.20	11.20	38	3.00
1.39	9.20	11.20	38	3.00
1.40	9.20	11.20	38	3.00
1.41	9.20	11.20	38	3.00
1.42	9.20	11.20	38	3.00
1.43	9.20	11.20	38	3.00
1.44	9.20	11.20	38	3.00
1.45	9.20	11.20	38	3.00
1.46	9.20	11.20	38	3.00
1.47	9.20	11.20	38	3.00
1.48	9.20	11.20	38	3.00
1.49	9.20	11.20	38	3.00
1.50	9.20	11.20	38	3.00
1.51	11.20	13.40	38	3.00
1.52	11.20	13.40	38	3.00
1.53	11.20	13.40	38	3.00
1.54	11.20	13.40	38	3.00
1.55	11.20	13.40	38	3.00
1.56	11.20	13.40	38	3.00
1.57	11.20	13.40	38	3.00
1.58	11.20	13.40	38	3.00
1.59	11.20	13.40	38	3.00
1.60	11.20	13.40	38	3.00
1.61	11.20	13.40	38	3.00
1.62	11.20	13.40	38	3.00
1.63	11.20	13.40	38	3.00
1.64	11.20	13.40	38	3.00
1.65	11.20	13.40	38	3.00
1.66	11.20	13.40	38	3.00
1.67	11.20	13.40	38	3.00
1.68	11.20	13.40	38	3.00
1.69	11.20	13.40	38	3.00
1.70	11.20	13.40	38	3.00
1.71	11.20	13.40	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.72	11.20	13.40	38	3.00
1.73	11.20	13.40	38	3.00
1.74	11.20	13.40	38	3.00
1.75	11.20	13.40	38	3.00
1.76	11.20	13.40	38	3.00
1.77	11.20	13.40	38	3.00
1.78	11.20	13.40	38	3.00
1.79	11.20	13.40	38	3.00
1.80	11.20	13.40	38	3.00
1.81	11.20	13.40	38	3.00
1.82	11.20	13.40	38	3.00
1.83	11.20	13.40	38	3.00
1.84	11.20	13.40	38	3.00
1.85	11.20	13.40	38	3.00
1.86	11.20	13.40	38	3.00
1.87	11.20	13.40	38	3.00
1.88	11.20	13.40	38	3.00
1.89	11.20	13.40	38	3.00
1.90	11.20	13.40	38	3.00
1.91	11.20	13.40	38	3.00
1.92	11.20	13.40	38	3.00
1.93	11.20	13.40	38	3.00
1.94	11.20	13.40	38	3.00
1.95	11.20	13.40	38	3.00
1.96	11.20	13.40	38	3.00
1.97	11.20	13.40	38	3.00
1.98	11.20	13.40	38	3.00
1.99	11.20	13.40	38	3.00
2.00	11.20	13.40	38	3.00
2.01	12.50	14.00	38	3.00
2.02	12.50	14.00	38	3.00
2.03	12.50	14.00	38	3.00
2.04	12.50	14.00	38	3.00
2.05	12.50	14.00	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.06	12.50	14.00	38	3.00
2.07	12.50	14.00	38	3.00
2.08	12.50	14.00	38	3.00
2.09	12.50	14.00	38	3.00
2.10	12.50	14.00	38	3.00
2.11	12.50	14.00	38	3.00
2.12	12.50	14.00	38	3.00
2.13	12.50	14.00	38	3.00
2.14	12.50	14.00	38	3.00
2.15	12.50	14.00	38	3.00
2.16	12.50	14.00	38	3.00
2.17	12.50	14.00	38	3.00
2.18	12.50	14.00	38	3.00
2.19	12.50	14.00	38	3.00
2.20	12.50	14.00	38	3.00
2.21	12.50	14.00	38	3.00
2.22	12.50	14.00	38	3.00
2.23	12.50	14.00	38	3.00
2.24	12.50	14.00	38	3.00
2.25	12.50	14.00	38	3.00
2.26	12.50	14.00	38	3.00
2.27	12.50	14.00	38	3.00
2.28	12.50	14.00	38	3.00
2.29	12.50	14.00	38	3.00
2.30	12.50	14.00	38	3.00
2.31	12.50	14.00	38	3.00
2.32	12.50	14.00	38	3.00
2.33	12.50	14.00	38	3.00
2.34	12.50	14.00	38	3.00
2.35	12.50	14.00	38	3.00
2.36	12.50	14.00	38	3.00
2.37	12.50	14.00	38	3.00
2.38	12.50	14.00	38	3.00
2.39	12.50	14.00	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.40	12.50	14.00	38	3.00
2.41	12.50	14.00	38	3.00
2.42	12.50	14.00	38	3.00
2.43	12.50	14.00	38	3.00
2.44	12.50	14.00	38	3.00
2.45	12.50	14.00	38	3.00
2.46	12.50	14.00	38	3.00
2.47	12.50	14.00	38	3.00
2.48	12.50	14.00	38	3.00
2.49	12.50	14.00	38	3.00
2.50	14.00	17.00	38	3.00
2.51	14.00	17.00	38	3.00
2.52	14.00	17.00	38	3.00
2.53	14.00	17.00	38	3.00
2.54	14.00	17.00	38	3.00
2.55	14.00	17.00	38	3.00
2.56	14.00	17.00	38	3.00
2.57	14.00	17.00	38	3.00
2.58	14.00	17.00	38	3.00
2.59	14.00	17.00	38	3.00
2.60	14.00	17.00	38	3.00
2.61	14.00	17.00	38	3.00
2.62	14.00	17.00	38	3.00
2.63	14.00	17.00	38	3.00
2.64	14.00	17.00	38	3.00
2.65	14.00	17.00	38	3.00
2.66	14.00	17.00	38	3.00
2.67	14.00	17.00	38	3.00
2.68	14.00	17.00	38	3.00
2.69	14.00	17.00	38	3.00
2.70	14.00	17.00	38	3.00
2.71	14.00	17.00	38	3.00
2.72	14.00	17.00	38	3.00
2.73	14.00	17.00	38	3.00

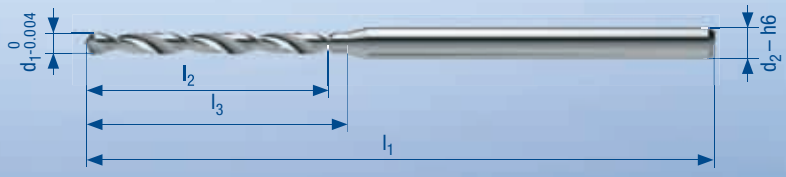
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.74	14.00	17.00	38	3.00
2.75	14.00	17.00	38	3.00
2.76	14.00	17.00	38	3.00
2.77	14.00	17.00	38	3.00
2.78	14.00	17.00	38	3.00
2.79	14.00	17.00	38	3.00
2.80	14.00	17.00	38	3.00
2.81	14.00	17.00	38	3.00
2.82	14.00	17.00	38	3.00
2.83	14.00	17.00	38	3.00
2.84	14.00	17.00	38	3.00
2.85	14.00	17.00	38	3.00
2.86	14.00	17.00	38	3.00
2.87	14.00	17.00	38	3.00
2.88	14.00	17.00	38	3.00
2.89	14.00	17.00	38	3.00
2.90	14.00	17.00	38	3.00
2.91	14.00	17.00	38	3.00
2.92	14.00	17.00	38	3.00
2.93	14.00	17.00	38	3.00
2.94	14.00	17.00	38	3.00
2.95	14.00	17.00	38	3.00
2.96	14.00	17.00	38	3.00
2.97	14.00	17.00	38	3.00
2.98	14.00	17.00	38	3.00
2.99	14.00	17.00	38	3.00
3.00	14.00	17.00	38	3.00

Mikrobohrer Tipdr ill 10 × d

Art. 50620

Micro foret Tipdrill 10 × d
Micro punta Tipdrill 10 × d
Micro drill Tipdrill 10 × d

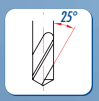
P1–3 | M1 | K1,2 | N2,3,5

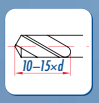


VHM MD/SC | SPHINX NORM

Typ N

Z 2





In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

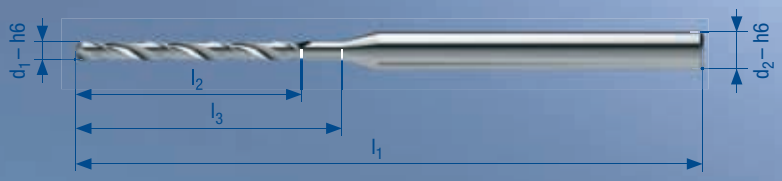
Vc → S./p. 164

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	4.00	5.00	30	1.00
0.55	4.00	5.00	30	1.00
0.60	8.00	12.00	30	1.00
0.65	8.00	12.00	30	1.00
0.70	11.70	12.50	30	1.00
0.75	11.70	12.50	30	1.00
0.80	11.70	12.50	30	1.50
0.85	11.70	12.50	30	1.50
0.90	11.70	12.50	30	1.50
0.95	11.70	12.50	30	1.50
1.00	11.70	12.50	30	1.50
1.05	12.00	13.00	30	1.50
1.10	12.00	13.00	30	1.50
1.15	12.00	13.00	30	1.50
1.20	12.00	13.00	30	1.50
1.25	12.00	13.00	30	1.50
1.30	12.00	13.00	30	1.50
1.35	12.00	13.00	30	1.50
1.40	12.00	13.00	30	1.50
1.45	12.00	13.00	30	1.50
1.50	12.00	13.00	30	2.00
1.55	12.00	13.00	30	2.00
1.60	12.00	13.00	30	2.00

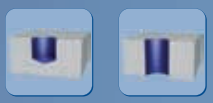
Mikrobohrer 12 × d
Micro foret 12 × d
Micro punta 12 × d
Micro drill 12 × d

Art. 50621

P1–3 | M1 | K1,2 | N2,3,5



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 130° | 25° | 12×d



Vc → S./p. 164

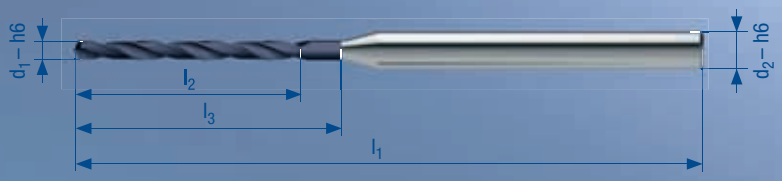
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	2.40	3.50	38	3.00
0.21	2.50	3.50	38	3.00
0.22	2.70	3.50	38	3.00
0.23	2.80	3.50	38	3.00
0.24	2.90	4.00	38	3.00
0.25	3.00	4.00	38	3.00
0.26	3.10	4.00	38	3.00
0.27	3.30	4.00	38	3.00
0.28	3.40	4.50	38	3.00
0.29	3.50	4.50	38	3.00
0.30	3.60	4.50	38	3.00
0.31	3.70	4.50	38	3.00
0.32	3.90	5.00	38	3.00
0.33	4.00	5.00	38	3.00
0.34	4.10	5.00	38	3.00
0.35	4.20	5.00	38	3.00
0.36	4.30	5.50	38	3.00
0.37	4.50	5.50	38	3.00
0.38	4.60	5.50	38	3.00
0.39	4.70	5.50	38	3.00
0.40	4.80	6.00	38	3.00
0.41	4.90	6.00	38	3.00
0.42	5.10	6.00	38	3.00
0.43	5.20	6.00	38	3.00
0.44	5.30	6.50	38	3.00
0.45	5.40	6.50	38	3.00
0.46	5.50	6.50	38	3.00
0.47	5.70	6.50	38	3.00
0.48	5.80	7.00	38	3.00
0.49	5.90	7.00	38	3.00
0.50	6.00	7.00	38	3.00
0.51	6.10	7.00	38	3.00
0.52	6.30	7.50	38	3.00
0.53	6.40	7.50	38	3.00
0.54	6.50	7.50	38	3.00
0.55	6.60	7.50	38	3.00
0.56	6.70	8.00	38	3.00
0.57	6.90	8.00	38	3.00
0.58	7.00	8.00	38	3.00
0.59	7.10	8.00	38	3.00
0.60	7.20	9.00	38	3.00
0.61	7.30	9.00	38	3.00
0.62	7.50	9.00	38	3.00
0.63	7.60	9.00	38	3.00
0.64	7.70	9.50	38	3.00
0.65	7.80	9.50	38	3.00
0.66	7.90	9.50	38	3.00
0.67	8.10	9.50	38	3.00
0.68	8.20	10.00	38	3.00
0.69	8.30	10.00	38	3.00
0.70	8.40	10.00	38	3.00
0.71	8.50	10.00	38	3.00
0.72	8.70	10.50	38	3.00
0.73	8.80	10.50	38	3.00
0.74	8.90	10.50	38	3.00
0.75	9.00	10.50	38	3.00
0.76	9.10	11.00	38	3.00
0.77	9.30	11.00	38	3.00
0.78	9.40	11.00	38	3.00
0.79	9.50	11.00	38	3.00
0.80	9.60	11.50	38	3.00
0.81	9.70	11.50	38	3.00
0.82	9.90	11.50	38	3.00
0.83	10.00	11.50	38	3.00
0.84	10.10	12.00	38	3.00
0.85	10.20	12.00	38	3.00
0.86	10.30	12.00	38	3.00
0.87	10.50	12.00	38	3.00
0.88	10.60	12.50	38	3.00
0.89	10.70	12.50	38	3.00
0.90	10.80	12.50	38	3.00
0.91	10.90	12.50	38	3.00
0.92	11.10	13.00	38	3.00
0.93	11.20	13.00	38	3.00
0.94	11.30	13.00	38	3.00
0.95	11.40	13.00	38	3.00
0.96	11.50	13.50	38	3.00
0.97	11.70	13.50	38	3.00
0.98	11.80	13.50	38	3.00
0.99	11.90	13.50	38	3.00
1.00	12.00	14.50	38	3.00
1.01	12.10	14.50	38	3.00
1.02	12.30	14.50	38	3.00
1.03	12.40	14.50	38	3.00
1.04	12.50	15.00	38	3.00
1.05	12.60	15.00	38	3.00
1.06	12.70	15.00	38	3.00
1.07	12.90	15.00	38	3.00
1.08	13.00	15.50	38	3.00
1.09	13.10	15.50	38	3.00
1.10	13.20	15.50	38	3.00
1.11	13.30	15.50	38	3.00
1.12	13.50	16.00	38	3.00
1.13	13.60	16.00	38	3.00
1.14	13.70	16.00	38	3.00
1.15	13.80	16.00	38	3.00
1.16	13.90	16.50	38	3.00
1.17	14.10	16.50	38	3.00
1.18	14.20	16.50	38	3.00
1.19	14.30	16.50	38	3.00
1.20	14.40	17.00	38	3.00
1.21	14.50	17.00	38	3.00
1.22	14.70	17.00	38	3.00
1.23	14.80	17.00	38	3.00
1.24	14.90	17.50	38	3.00
1.25	15.00	17.50	38	3.00
1.26	15.10	17.50	50	3.00
1.27	15.30	17.50	50	3.00
1.28	15.40	18.00	50	3.00
1.29	15.50	18.00	50	3.00
1.30	15.60	18.00	50	3.00
1.31	15.70	18.00	50	3.00
1.32	15.90	18.50	50	3.00
1.33	16.00	18.50	50	3.00
1.34	16.10	18.50	50	3.00
1.35	16.20	18.50	50	3.00
1.36	16.30	19.00	50	3.00
1.37	16.50	19.00	50	3.00
1.38	16.60	19.00	50	3.00
1.39	16.70	19.00	50	3.00
1.40	16.80	19.50	50	3.00
1.41	16.90	19.50	50	3.00
1.42	17.10	19.50	50	3.00
1.43	17.20	19.50	50	3.00
1.44	17.30	20.00	50	3.00
1.45	17.40	20.00	50	3.00
1.46	17.50	20.00	50	3.00
1.47	17.70	20.00	50	3.00
1.48	17.80	20.50	50	3.00
1.49	17.90	20.50	50	3.00
1.50	18.00	21.00	50	3.00
1.51	18.10	21.00	50	3.00
1.52	18.30	21.00	50	3.00
1.53	18.40	21.00	50	3.00
1.54	18.50	21.50	50	3.00
1.55	18.60	21.50	50	3.00
1.56	18.70	21.50	50	3.00
1.57	18.90	21.50	50	3.00
1.58	19.00	22.00	50	3.00
1.59	19.10	22.00	50	3.00
1.60	19.20	22.00	50	3.00
1.61	19.30	22.00	50	3.00
1.62	19.40	22.50	50	3.00
1.63	19.60	22.50	50	3.00
1.64	19.70	22.50	50	3.00
1.65	19.80	22.50	50	3.00
1.66	19.90	23.00	50	3.00
1.67	20.10	23.00	50	3.00
1.68	20.20	23.00	50	3.00
1.69	20.30	23.00	50	3.00
1.70	20.40	23.50	50	3.00
1.71	20.50	23.50	50	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.72	20.70	23.50	50	3.00
1.73	20.80	23.50	50	3.00
1.74	20.90	24.00	50	3.00
1.75	21.00	24.00	50	3.00
1.76	21.10	24.00	50	3.00
1.77	21.30	24.00	50	3.00
1.78	21.40	24.50	50	3.00
1.79	21.50	24.50	50	3.00
1.80	21.60	25.00	50	3.00
1.81	21.70	25.00	50	3.00
1.82	21.90	25.00	50	3.00
1.83	22.00	25.00	50	3.00
1.84	22.10	25.50	50	3.00
1.85	22.20	25.50	50	3.00
1.86	22.30	25.50	50	3.00
1.87	22.50	25.50	50	3.00
1.88	22.60	26.00	50	3.00
1.89	22.70	26.00	50	3.00
1.90	22.80	26.00	50	3.00
1.91	22.90	26.00	50	3.00
1.92	23.10	26.50	50	3.00
1.93	23.20	26.50	50	3.00
1.94	23.30	26.50	50	3.00
1.95	23.40	26.50	50	3.00
1.96	23.50	27.00	50	3.00
1.97	23.70	27.00	50	3.00
1.98	23.80	27.00	50	3.00
1.99	23.90	27.00	50	3.00
2.00	24.00	27.00	50	3.00
2.01	24.10	27.50	60	3.00
2.02	24.20	27.50	60	3.00
2.03	24.40	27.50	60	3.00
2.04	24.50	27.50	60	3.00
2.05	24.60	28.00	60	3.00
2.06	24.70	28.00	60	3.00
2.07	24.80	28.00	60	3.00
2.08	25.00	28.00	60	3.00
2.09	25.10	28.50	60	3.00
2.10	25.20	28.50	60	3.00
2.11	24.40	28.50	60	3.00
2.12	25.40	28.50	60	3.00
2.13	25.60	29.00	60	3.00
2.14	25.70	29.00	60	3.00
2.15	25.80	29.00	60	3.00
2.16	25.90	29.00	60	3.00
2.17	26.10	29.50	60	3.00
2.18	26.20	29.50	60	3.00
2.19	26.30	29.50	60	3.00
2.20	26.40	29.50	60	3.00
2.21	26.50	30.00	60	3.00
2.22	26.70	30.00	60	3.00
2.23	26.80	30.00	60	3.00
2.24	26.90	30.00	60	3.00
2.25	27.00	30.50	60	3.00
2.26	27.10	30.50	60	3.00
2.27	27.20	30.50	60	3.00
2.28	27.40	30.50	60	3.00
2.29	27.50	31.00	60	3.00
2.30	27.60	31.00	60	3.00
2.31	27.70	31.00	65	3.00
2.32	27.80	31.00	65	3.00
2.33	28.00	31.50	65	3.00
2.34	28.10	31.50	65	3.00
2.35	28.20	31.50	65	3.00
2.36	28.30	31.50	65	3.00
2.37	28.40	32.00	65	3.00
2.38	28.60	32.00	65	3.00
2.39	28.70	32.00	65	3.00
2.40	28.80	32.00	65	3.00
2.41	28.90	33.00	65	3.00
2.42	29.00	33.00	65	3.00
2.43	29.20	33.00	65	3.00
2.44	29.30	33.00	65	3.00
2.45	29.40	33.00	65	3.00
2.46	29.50	33.50	65	3.00
2.47	29.60	33.50	65	3.00
2.48	29.80	33.50	65	3.00
2.49	29.90	33.50	65	3.00
2.50	30.00	34.00	65	3.00
2.51	30.10	34.00	65	3.00
2.52	30.20	34.00	65	3.00
2.53	30.40	34.00	65	3.00
2.54	30.50	34.50	65	3.00
2.55	30.60	34.50	65	3.00
2.56	30.70	34.50	65	3.00
2.57	30.80	34.50	65	3.00
2.58	31.00	35.00	65	3.00
2.59	31.10	35.00	65	3.00
2.60	31.20	35.00	65	3.00
2.61	31.30	35.00	65	3.00
2.62	31.40	35.50	65	3.00
2.63	31.60	35.50	65	3.00
2.64	31.70	35.50	65	3.00
2.65	31.80	35.50	65	3.00
2.66	31.90	36.00	65	3.00
2.67	32.00	36.00	65	3.00
2.68	32.20	36.00	65	3.00
2.69	32.30	36.00	65	3.00
2.70	32.40	36.50	65	3.00
2.71	32.50	36.50	65	3.00
2.72	32.60	36.50	65	3.00
2.73	32.80	36.50	65	3.00
2.74	32.90	37.00	65	3.00
2.75	33.00	37.00	65	3.00
2.76	33.10	37.00	65	3.00
2.77	33.20	37.00	65	3.00
2.78	33.40	37.50	65	3.00
2.79	33.50	37.50	65	3.00
2.80	33.60	37.50	65	3.00
2.81	33.70	37.50	65	3.00
2.82	33.80	38.00	65	3.00
2.83	34.00	38.00	65	3.00
2.84	34.10	38.00	65	3.00
2.85	34.20	38.00	65	3.00
2.86	34.30	38.50	65	3.00
2.87	34.40	38.50	65	3.00
2.88	34.60	38.50	65	3.00
2.89	34.70	38.50	65	3.00
2.90	34.80	39.00	65	3.00
2.91	34.90	39.00	65	3.00
2.92	35.00	39.00	65	3.00
2.93	35.20	39.00	65	3.00
2.94	35.30	39.50	65	3.00
2.95	35.40	39.50	65	3.00
2.96	35.50	39.50	65	3.00
2.97	35.60	39.50	65	3.00
2.98	35.80	40.00	65	3.00
2.99	35.90	40.00	65	3.00
3.00	36.00	40.00	65	3.00

Mikrobohrer 12 × d
Micro foret 12 × d
Micro punta 12 × d
Micro drill 12 × d

Art. 50622

P1–3 | M1 | K1,2 | N2,3,5



VHM MD/SC | SPHINX NORM

Typ N

Z 2

TiAlN

Vc → S./p. 164

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	2.40	3.50	38	3.00
0.21	2.50	3.50	38	3.00
0.22	2.70	3.50	38	3.00
0.23	2.80	3.50	38	3.00
0.24	2.90	4.00	38	3.00
0.25	3.00	4.00	38	3.00
0.26	3.10	4.00	38	3.00
0.27	3.30	4.00	38	3.00
0.28	3.40	4.50	38	3.00
0.29	3.50	4.50	38	3.00
0.30	3.60	4.50	38	3.00
0.31	3.70	4.50	38	3.00
0.32	3.90	5.00	38	3.00
0.33	4.00	5.00	38	3.00
0.34	4.10	5.00	38	3.00
0.35	4.20	5.00	38	3.00
0.36	4.30	5.50	38	3.00
0.37	4.50	5.50	38	3.00
0.38	4.60	5.50	38	3.00
0.39	4.70	5.50	38	3.00
0.40	4.80	6.00	38	3.00
0.41	4.90	6.00	38	3.00
0.42	5.10	6.00	38	3.00
0.43	5.20	6.00	38	3.00
0.44	5.30	6.50	38	3.00
0.45	5.40	6.50	38	3.00
0.46	5.50	6.50	38	3.00
0.47	5.70	6.50	38	3.00
0.48	5.80	7.00	38	3.00
0.49	5.90	7.00	38	3.00
0.50	6.00	7.00	38	3.00
0.51	6.10	7.00	38	3.00
0.52	6.30	7.50	38	3.00
0.53	6.40	7.50	38	3.00
0.54	6.50	7.50	38	3.00
0.55	6.60	7.50	38	3.00
0.56	6.70	8.00	38	3.00
0.57	6.90	8.00	38	3.00
0.58	7.00	8.00	38	3.00
0.59	7.10	8.00	38	3.00
0.60	7.20	9.00	38	3.00
0.61	7.30	9.00	38	3.00
0.62	7.50	9.00	38	3.00
0.63	7.60	9.00	38	3.00
0.64	7.70	9.50	38	3.00
0.65	7.80	9.50	38	3.00
0.66	7.90	9.50	38	3.00
0.67	8.10	9.50	38	3.00
0.68	8.20	10.00	38	3.00
0.69	8.30	10.00	38	3.00
0.70	8.40	10.00	38	3.00
0.71	8.50	10.00	38	3.00
0.72	8.70	10.50	38	3.00
0.73	8.80	10.50	38	3.00
0.74	8.90	10.50	38	3.00
0.75	9.00	10.50	38	3.00
0.76	9.10	11.00	38	3.00
0.77	9.30	11.00	38	3.00
0.78	9.40	11.00	38	3.00
0.79	9.50	11.00	38	3.00
0.80	9.60	11.50	38	3.00
0.81	9.70	11.50	38	3.00
0.82	9.90	11.50	38	3.00
0.83	10.00	11.50	38	3.00
0.84	10.10	12.00	38	3.00
0.85	10.20	12.00	38	3.00
0.86	10.30	12.00	38	3.00
0.87	10.50	12.00	38	3.00
0.88	10.60	12.50	38	3.00
0.89	10.70	12.50	38	3.00
0.90	10.80	12.50	38	3.00
0.91	10.90	12.50	38	3.00
0.92	11.10	13.00	38	3.00
0.93	11.20	13.00	38	3.00
0.94	11.30	13.00	38	3.00
0.95	11.40	13.00	38	3.00
0.96	11.50	13.50	38	3.00
0.97	11.70	13.50	38	3.00
0.98	11.80	13.50	38	3.00
0.99	11.90	13.50	38	3.00
1.00	12.00	14.50	38	3.00
1.01	12.10	14.50	38	3.00
1.02	12.30	14.50	38	3.00
1.03	12.40	14.50	38	3.00
1.04	12.50	15.00	38	3.00
1.05	12.60	15.00	38	3.00
1.06	12.70	15.00	38	3.00
1.07	12.90	15.00	38	3.00
1.08	13.00	15.50	38	3.00
1.09	13.10	15.50	38	3.00
1.10	13.20	15.50	38	3.00
1.11	13.30	15.50	38	3.00
1.12	13.50	16.00	38	3.00
1.13	13.60	16.00	38	3.00
1.14	13.70	16.00	38	3.00
1.15	13.80	16.00	38	3.00
1.16	13.90	16.50	38	3.00
1.17	14.10	16.50	38	3.00
1.18	14.20	16.50	38	3.00
1.19	14.30	16.50	38	3.00
1.20	14.40	17.00	38	3.00
1.21	14.50	17.00	38	3.00
1.22	14.70	17.00	38	3.00
1.23	14.80	17.00	38	3.00
1.24	14.90	17.50	38	3.00
1.25	15.00	17.50	38	3.00
1.26	15.10	17.50	50	3.00
1.27	15.30	17.50	50	3.00
1.28	15.40	18.00	50	3.00
1.29	15.50	18.00	50	3.00
1.30	15.60	18.00	50	3.00
1.31	15.70	18.00	50	3.00
1.32	15.90	18.50	50	3.00
1.33	16.00	18.50	50	3.00
1.34	16.10	18.50	50	3.00
1.35	16.20	18.50	50	3.00
1.36	16.30	19.00	50	3.00
1.37	16.50	19.00	50	3.00
1.38	16.60	19.00	50	3.00
1.39	16.70	19.00	50	3.00
1.40	16.80	19.50	50	3.00
1.41	16.90	19.50	50	3.00
1.42	17.10	19.50	50	3.00
1.43	17.20	19.50	50	3.00
1.44	17.30	20.00	50	3.00
1.45	17.40	20.00	50	3.00
1.46	17.50	20.00	50	3.00
1.47	17.70	20.00	50	3.00
1.48	17.80	20.50	50	3.00
1.49	17.90	20.50	50	3.00
1.50	18.00	21.00	50	3.00
1.51	18.10	21.00	50	3.00
1.52	18.30	21.00	50	3.00
1.53	18.40	21.00	50	3.00
1.54	18.50	21.50	50	3.00
1.55	18.60	21.50	50	3.00
1.56	18.70	21.50	50	3.00
1.57	18.90	21.50	50	3.00
1.58	19.00	22.00	50	3.00
1.59	19.10	22.00	50	3.00
1.60	19.20	22.00	50	3.00
1.61	19.30	22.00	50	3.00
1.62	19.40	22.50	50	3.00
1.63	19.60	22.50	50	3.00
1.64	19.70	22.50	50	3.00
1.65	19.80	22.50	50	3.00
1.66	19.90	23.00	50	3.00
1.67	20.10	23.00	50	3.00
1.68	20.20	23.00	50	3.00
1.69	20.30	23.00	50	3.00
1.70	20.40	23.50	50	3.00
1.71	20.50	23.50	50	3.00

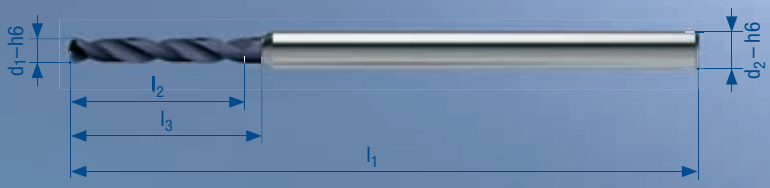
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.72	20.70	23.50	50	3.00
1.73	20.80	23.50	50	3.00
1.74	20.90	24.00	50	3.00
1.75	21.00	24.00	50	3.00
1.76	21.10	24.00	50	3.00
1.77	21.30	24.00	50	3.00
1.78	21.40	24.50	50	3.00
1.79	21.50	24.50	50	3.00
1.80	21.60	25.00	50	3.00
1.81	21.70	25.00	50	3.00
1.82	21.90	25.00	50	3.00
1.83	22.00	25.00	50	3.00
1.84	22.10	25.50	50	3.00
1.85	22.20	25.50	50	3.00
1.86	22.30	25.50	50	3.00
1.87	22.50	25.50	50	3.00
1.88	22.60	26.00	50	3.00
1.89	22.70	26.00	50	3.00
1.90	22.80	26.00	50	3.00
1.91	22.90	26.00	50	3.00
1.92	23.10	26.50	50	3.00
1.93	23.20	26.50	50	3.00
1.94	23.30	26.50	50	3.00
1.95	23.40	26.50	50	3.00
1.96	23.50	27.00	50	3.00
1.97	23.70	27.00	50	3.00
1.98	23.80	27.00	50	3.00
1.99	23.90	27.00	50	3.00
2.00	24.00	27.00	50	3.00
2.01	24.10	27.50	60	3.00
2.02	24.20	27.50	60	3.00
2.03	24.40	27.50	60	3.00
2.04	24.50	27.50	60	3.00
2.05	24.60	28.00	60	3.00
2.06	24.70	28.00	60	3.00
2.07	24.80	28.00	60	3.00
2.08	25.00	28.00	60	3.00
2.09	25.10	28.50	60	3.00
2.10	25.20	28.50	60	3.00
2.11	24.40	28.50	60	3.00
2.12	25.40	28.50	60	3.00
2.13	25.60	29.00	60	3.00
2.14	25.70	29.00	60	3.00
2.15	25.80	29.00	60	3.00
2.16	25.90	29.00	60	3.00
2.17	26.10	29.50	60	3.00
2.18	26.20	29.50	60	3.00
2.19	26.30	29.50	60	3.00
2.20	26.40	29.50	60	3.00
2.21	26.50	30.00	60	3.00
2.22	26.70	30.00	60	3.00
2.23	26.80	30.00	60	3.00
2.24	26.90	30.00	60	3.00
2.25	27.00	30.50	60	3.00
2.26	27.10	30.50	60	3.00
2.27	27.20	30.50	60	3.00
2.28	27.40	30.50	60	3.00
2.29	27.50	31.00	60	3.00
2.30	27.60	31.00	60	3.00
2.31	27.70	31.00	65	3.00
2.32	27.80	31.00	65	3.00
2.33	28.00	31.50	65	3.00
2.34	28.10	31.50	65	3.00
2.35	28.20	31.50	65	3.00
2.36	28.30	31.50	65	3.00
2.37	28.40	32.00	65	3.00
2.38	28.60	32.00	65	3.00
2.39	28.70	32.00	65	3.00
2.40	28.80	32.00	65	3.00
2.41	28.90	33.00	65	3.00
2.42	29.00	33.00	65	3.00
2.43	29.20	33.00	65	3.00
2.44	29.30	33.00	65	3.00
2.45	29.40	33.00	65	3.00
2.46	29.50	33.50	65	3.00
2.47	29.60	33.50	65	3.00
2.48	29.80	33.50	65	3.00
2.49	29.90	33.50	65	3.00
2.50	30.00	34.00	65	3.00
2.51	30.10	34.00	65	3.00
2.52	30.20	34.00	65	3.00
2.53	30.40	34.00	65	3.00
2.54	30.50	34.50	65	3.00
2.55	30.60	34.50	65	3.00
2.56	30.70	34.50	65	3.00
2.57	30.80	34.50	65	3.00
2.58	31.00	35.00	65	3.00
2.59	31.10	35.00	65	3.00
2.60	31.20	35.00	65	3.00
2.61	31.30	35.00	65	3.00
2.62	31.40	35.50	65	3.00
2.63	31.60	35.50	65	3.00
2.64	31.70	35.50	65	3.00
2.65	31.80	35.50	65	3.00
2.66	31.90	36.00	65	3.00
2.67	32.00	36.00	65	3.00
2.68	32.20	36.00	65	3.00
2.69	32.30	36.00	65	3.00
2.70	32.40	36.50	65	3.00
2.71	32.50	36.50	65	3.00
2.72	32.60	36.50	65	3.00
2.73	32.80	36.50	65	3.00
2.74	32.90	37.00	65	3.00
2.75	33.00	37.00	65	3.00
2.76	33.10	37.00	65	3.00
2.77	33.20	37.00	65	3.00
2.78	33.40	37.50	65	3.00
2.79	33.50	37.50	65	3.00
2.80	33.60	37.50	65	3.00
2.81	33.70	37.50	65	3.00
2.82	33.80	38.00	65	3.00
2.83	34.00	38.00	65	3.00
2.84	34.10	38.00	65	3.00
2.85	34.20	38.00	65	3.00
2.86	34.30	38.50	65	3.00
2.87	34.40	38.50	65	3.00
2.88	34.60	38.50	65	3.00
2.89	34.70	38.50	65	3.00
2.90	34.80	39.00	65	3.00
2.91	34.90	39.00	65	3.00
2.92	35.00	39.00	65	3.00
2.93	35.20	39.00	65	3.00
2.94	35.30	39.50	65	3.00
2.95	35.40	39.50	65	3.00
2.96	35.50	39.50	65	3.00
2.97	35.60	39.50	65	3.00
2.98	35.80	40.00	65	3.00
2.99	35.90	40.00	65	3.00
3.00	36.00	40.00	65	3.00

Mikro Hochleistungsbohrer 6×d

Art. 50941

Micro foret à grand rendement Phoenix 6×d
Micro punta ad alto rendimento Phoenix 6×d
Micro high performance drill Phoenix 6×d

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | 30° | 6×d | TiAlN

Ohne Innenkühlung
Sans trou d'huile
Senza fori di lubrificazione
Without internal coolant

Vc → S./p. 165

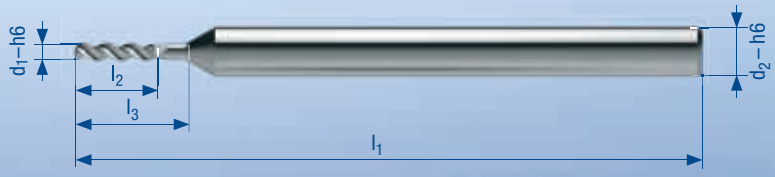
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	3.00	4.80	38	3.00
0.60	3.60	5.40	38	3.00
0.70	4.20	6.00	38	3.00
0.80	4.80	6.70	38	3.00
0.90	5.40	7.80	38	3.00
1.00	6.00	8.00	38	3.00
1.10	6.60	8.60	38	3.00
1.20	7.20	9.20	38	3.00
1.30	7.80	9.80	38	3.00
1.40	8.40	10.40	38	3.00
1.50	9.00	11.00	38	3.00
1.60	9.60	12.60	38	3.00
1.70	10.20	13.20	38	3.00
1.80	10.80	13.80	38	3.00
1.90	11.40	14.40	38	3.00
2.00	12.00	15.00	50	3.00
2.10	12.60	15.60	50	3.00
2.20	13.20	16.20	50	3.00
2.30	13.80	16.80	50	3.00
2.40	14.40	17.40	50	3.00

Mikrotricut 5 × d

Microtricut 5 × d
Microtricut 5 × d
Microtricut 5 × d

Art. 55652

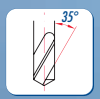
P1,2 | M1 | K1,2 | N2,3,6 | S1 | 01

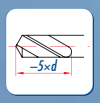


VHM MD/SC | SPHINX NORM

H7 – H9

Z 3





Vc → S./p. 165

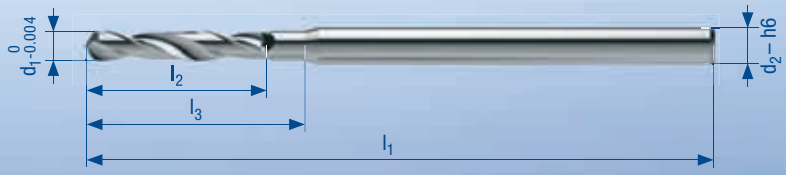
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	1.00	1.50	38	3.00
0.21	1.05	1.50	38	3.00
0.22	1.10	1.60	38	3.00
0.23	1.15	1.60	38	3.00
0.24	1.20	1.70	38	3.00
0.25	1.25	1.70	38	3.00
0.26	1.30	1.80	38	3.00
0.27	1.35	1.80	38	3.00
0.28	1.40	1.90	38	3.00
0.29	1.45	1.90	38	3.00
0.30	1.50	2.00	38	3.00
0.31	1.55	2.00	38	3.00
0.32	1.60	2.10	38	3.00
0.33	1.65	2.10	38	3.00
0.34	1.70	2.20	38	3.00
0.35	1.75	2.20	38	3.00
0.36	1.80	2.30	38	3.00
0.37	1.85	2.30	38	3.00
0.38	1.90	2.40	38	3.00
0.39	1.95	2.40	38	3.00
0.40	2.00	2.50	38	3.00
0.41	2.05	2.50	38	3.00
0.42	2.10	2.60	38	3.00
0.43	2.15	2.60	38	3.00
0.44	2.20	2.70	38	3.00
0.45	2.25	2.70	38	3.00
0.46	2.30	2.80	38	3.00
0.47	2.35	2.80	38	3.00
0.48	2.40	2.90	38	3.00
0.49	2.45	2.90	38	3.00
0.50	2.50	3.00	38	3.00
0.51	2.55	3.00	38	3.00
0.52	2.60	3.10	38	3.00
0.53	2.65	3.10	38	3.00
0.54	2.70	3.20	38	3.00
0.55	2.75	3.20	38	3.00
0.56	2.80	3.30	38	3.00
0.57	2.85	3.30	38	3.00
0.58	2.90	3.40	38	3.00
0.59	2.95	3.40	38	3.00
0.60	3.00	3.50	38	3.00
0.61	3.05	3.50	38	3.00
0.62	3.10	3.60	38	3.00
0.63	3.15	3.60	38	3.00
0.64	3.20	3.70	38	3.00
0.65	3.25	3.70	38	3.00
0.66	3.30	3.80	38	3.00
0.67	3.35	3.80	38	3.00
0.68	3.40	3.90	38	3.00
0.69	3.45	3.90	38	3.00
0.70	3.50	4.00	38	3.00
0.71	3.55	4.00	38	3.00
0.72	3.60	4.10	38	3.00
0.73	3.65	4.10	38	3.00
0.74	3.70	4.20	38	3.00
0.75	3.75	4.20	38	3.00
0.76	3.80	4.30	38	3.00
0.77	3.85	4.30	38	3.00
0.78	3.90	4.40	38	3.00
0.79	3.95	4.40	38	3.00
0.80	4.00	4.50	38	3.00
0.81	4.05	4.50	38	3.00
0.82	4.10	4.60	38	3.00
0.83	4.15	4.60	38	3.00
0.84	4.20	4.70	38	3.00
0.85	4.25	4.70	38	3.00
0.86	4.30	4.80	38	3.00
0.87	4.35	4.80	38	3.00
0.88	4.40	4.90	38	3.00
0.89	4.45	4.90	38	3.00
0.90	4.50	5.00	38	3.00
0.91	4.55	5.00	38	3.00
0.92	4.60	5.10	38	3.00
0.93	4.65	5.10	38	3.00
0.94	4.70	5.20	38	3.00
0.95	4.75	5.20	38	3.00
0.96	4.80	5.30	38	3.00
0.97	4.85	5.30	38	3.00
0.98	4.90	5.40	38	3.00
0.99	4.95	5.40	38	3.00
1.00	5.00	6.50	38	3.00
1.01	5.05	6.50	38	3.00
1.02	5.10	6.50	38	3.00
1.03	5.15	6.50	38	3.00
1.04	5.20	6.50	38	3.00
1.05	5.25	6.50	38	3.00
1.06	5.30	6.50	38	3.00
1.07	5.35	7.50	38	3.00
1.08	5.40	7.50	38	3.00
1.09	5.45	7.50	38	3.00
1.10	5.50	7.50	38	3.00
1.11	5.55	7.50	38	3.00
1.12	5.60	7.50	38	3.00
1.13	5.65	7.50	38	3.00
1.14	5.70	7.50	38	3.00
1.15	5.75	7.50	38	3.00
1.16	5.80	7.50	38	3.00
1.17	5.85	7.50	38	3.00
1.18	5.90	8.50	38	3.00
1.19	5.95	8.50	38	3.00
1.20	6.00	8.50	38	3.00
1.21	6.05	8.50	38	3.00
1.22	6.10	8.50	38	3.00
1.23	6.15	8.50	38	3.00
1.24	6.20	8.50	38	3.00
1.25	6.25	8.50	38	3.00
1.26	6.30	8.50	38	3.00
1.27	6.35	8.50	38	3.00
1.28	6.40	8.50	38	3.00
1.29	6.45	8.50	38	3.00
1.30	6.50	8.50	38	3.00
1.31	6.55	8.50	38	3.00
1.32	6.60	8.50	38	3.00
1.33	6.65	9.50	38	3.00
1.34	6.70	9.50	38	3.00
1.35	6.75	9.50	38	3.00
1.36	6.80	9.50	38	3.00
1.37	6.85	9.50	38	3.00
1.38	6.90	9.50	38	3.00
1.39	6.95	9.50	38	3.00
1.40	7.00	9.50	38	3.00
1.41	7.05	9.50	38	3.00
1.42	7.10	9.50	38	3.00
1.43	7.15	9.50	38	3.00
1.44	7.20	9.50	38	3.00
1.45	7.25	9.50	38	3.00
1.46	7.30	9.50	38	3.00
1.47	7.35	9.50	38	3.00
1.48	7.40	9.50	38	3.00
1.49	7.45	9.50	38	3.00
1.50	7.50	9.50	38	3.00
1.51	7.55	10.50	38	3.00
1.52	7.60	10.50	38	3.00
1.53	7.65	10.50	38	3.00
1.54	7.70	10.50	38	3.00
1.55	7.75	10.50	38	3.00
1.56	7.80	10.50	38	3.00
1.57	7.85	10.50	38	3.00
1.58	7.90	10.50	38	3.00
1.59	7.95	10.50	38	3.00
1.60	8.00	10.50	38	3.00
1.61	8.05	10.50	38	3.00
1.62	8.10	10.50	38	3.00
1.63	8.15	10.50	38	3.00
1.64	8.20	10.50	38	3.00
1.65	8.25	10.50	38	3.00
1.66	8.30	10.50	38	3.00
1.67	8.35	10.50	38	3.00
1.68	8.40	10.50	38	3.00
1.69	8.45	10.50	38	3.00
1.70	8.50	10.50	38	3.00
1.71	8.55	11.50	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.72	8.60	11.50	38	3.00
1.73	8.65	11.50	38	3.00
1.74	8.70	11.50	38	3.00
1.75	8.75	11.50	38	3.00
1.76	8.80	11.50	38	3.00
1.77	8.85	11.50	38	3.00
1.78	8.90	11.50	38	3.00
1.79	8.95	11.50	38	3.00
1.80	9.00	11.50	38	3.00
1.81	9.05	11.50	38	3.00
1.82	9.10	11.50	38	3.00
1.83	9.15	11.50	38	3.00
1.84	9.20	11.50	38	3.00
1.85	9.25	11.50	38	3.00
1.86	9.30	11.50	38	3.00
1.87	9.35	11.50	38	3.00
1.88	9.40	11.50	38	3.00
1.89	9.45	11.50	38	3.00
1.90	9.50	11.50	38	3.00
1.91	9.55	12.50	38	3.00
1.92	9.60	12.50	38	3.00
1.93	9.65	12.50	38	3.00
1.94	9.70	12.50	38	3.00
1.95	9.75	12.50	38	3.00
1.96	9.80	12.50	38	3.00
1.97	9.85	12.50	38	3.00
1.98	9.90	12.50	38	3.00
1.99	9.95	12.50	38	3.00
2.00	10.00	12.50	38	3.00
2.01	10.05	12.50	38	3.00
2.02	10.10	12.50	38	3.00
2.03	10.15	12.50	38	3.00
2.04	10.20	12.50	38	3.00
2.05	10.25	12.50	38	3.00
2.06	10.30	12.50	38	3.00
2.07	10.35	12.50	38	3.00
2.08	10.40	12.50	38	3.00
2.09	10.45	12.50	38	3.00
2.10	10.50	12.50	38	3.00
2.11	10.55	12.50	38	3.00
2.12	10.60	12.50	38	3.00
2.13	10.65	13.50	38	3.00
2.14	10.70	13.50	38	3.00
2.15	10.75	13.50	38	3.00
2.16	10.80	13.50	38	3.00
2.17	10.85	13.50	38	3.00
2.18	10.90	13.50	38	3.00
2.19	10.95	13.50	38	3.00
2.20	11.00	13.50	38	3.00
2.21	11.05	13.50	38	3.00
2.22	11.10	13.50	38	3.00
2.23	11.15	13.50	38	3.00
2.24	11.20	13.50	38	3.00
2.25	11.25	13.50	38	3.00
2.26	11.30	13.50	38	3.00
2.27	11.35	13.50	38	3.00
2.28	11.40	13.50	38	3.00
2.29	11.45	13.50	38	3.00
2.30	11.50	13.50	38	3.00
2.31	11.55	13.50	38	3.00
2.32	11.60	13.50	38	3.00
2.33	11.65	13.50	38	3.00
2.34	11.70	13.50	38	3.00
2.35	11.75	13.50	38	3.00
2.36	11.80	13.50	38	3.00
2.37	11.85	14.50	38	3.00
2.38	11.90	14.50	38	3.00
2.39	11.95	14.50	38	3.00
2.40	12.00	14.50	38	3.00
2.41	12.05	14.50	38	3.00
2.42	12.10	14.50	38	3.00
2.43	12.15	14.50	38	3.00
2.44	12.20	14.50	38	3.00
2.45	12.25	14.50	38	3.00
2.46	12.30	14.50	38	3.00
2.47	12.35	14.50	38	3.00
2.48	12.40	14.50	38	3.00
2.49	12.45	14.50	38	3.00
2.50	12.50	14.50	38	3.00
2.51	12.55	14.50	38	3.00
2.52	12.60	14.50	38	3.00
2.53	12.65	14.50	38	3.00
2.54	12.70	14.50	38	3.00
2.55	12.75	14.50	38	3.00
2.56	12.80	14.50	38	3.00
2.57	12.85	14.50	38	3.00
2.58	12.90	14.50	38	3.00
2.59	12.95	14.50	38	3.00
2.60	13.00	14.50	38	3.00
2.61	13.05	14.50	38	3.00
2.62	13.10	14.50	38	3.00
2.63	13.15	14.50	38	3.00
2.64	13.20	14.50	38	3.00
2.65	13.25	14.50	38	3.00
2.66	13.30	16.50	38	3.00
2.67	13.35	16.50	38	3.00
2.68	13.40	16.50	38	3.00
2.69	13.45	16.50	38	3.00
2.70	13.50	16.50	38	3.00
2.71	13.55	16.50	38	3.00
2.72	13.60	16.50	38	3.00
2.73	13.65	16.50	38	3.00
2.74	13.70	16.50	38	3.00
2.75	13.75	16.50	38	3.00
2.76	13.80	16.50	38	3.00
2.77	13.85	16.50	38	3.00
2.78	13.90	16.50	38	3.00
2.79	13.95	16.50	38	3.00
2.80	14.00	16.50	38	3.00
2.81	14.05	16.50	38	3.00
2.82	14.10	16.50	38	3.00
2.83	14.15	16.50	38	3.00
2.84	14.20	16.50	38	3.00
2.85	14.25	16.50	38	3.00
2.86	14.30	16.50	38	3.00
2.87	14.35	16.50	38	3.00
2.88	14.40	16.50	38	3.00
2.89	14.45	16.50	38	3.00
2.90	14.50	16.50	38	3.00
2.91	14.55	16.50	38	3.00
2.92	14.60	16.50	38	3.00
2.93	14.65	16.50	38	3.00
2.94	14.70	16.50	38	3.00
2.95	14.75	16.50	38	3.00
2.96	14.80	16.50	38	3.00
2.97	14.85	16.50	38	3.00
2.98	14.90	16.50	38	3.00
2.99	14.95	16.50	38	3.00

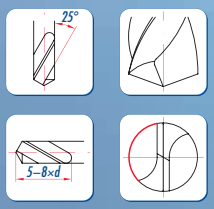
Mikrobohrer Spirec 6×d aus HSS-E — Art. 12604

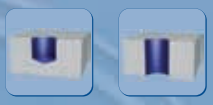
Micro foret Spirec 6×d en HSS-E
Micro punta Spirec 6×d in HSS-E
Micro drill Spirec 6×d in HSS-E

P1,2 | M1,2 | K1,2 | N1,2,5



HSS-E Co 8% | DIN 1899-A | SPHINX NORM | Z 2 | Typ N





In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

Vc → S./p. 166

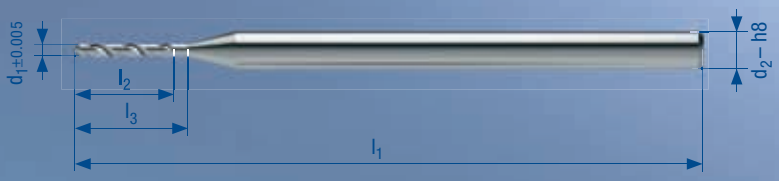
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.05	0.40	0.60	25	1.00
0.06	0.40	0.60	25	1.00
0.07	0.50	0.70	25	1.00
0.08	0.50	0.70	25	1.00
0.09	0.50	0.70	25	1.00
0.10	0.50	0.70	25	1.00
0.11	0.50	0.70	25	1.00
0.12	0.50	0.70	25	1.00
0.13	0.80	1.00	25	1.00
0.14	0.80	1.00	25	1.00
0.15	0.80	1.00	25	1.00
0.16	1.10	1.40	25	1.00
0.17	1.10	1.40	25	1.00
0.18	1.10	1.40	25	1.00
0.19	1.10	1.40	25	1.00
0.20	1.50	1.80	25	1.00
0.21	1.50	1.80	25	1.00
0.22	1.50	1.80	25	1.00
0.23	1.50	1.80	25	1.00
0.24	1.50	1.80	25	1.00
0.25	1.90	2.20	25	1.00
0.26	1.90	2.20	25	1.00
0.27	1.90	2.20	25	1.00
0.28	1.90	2.20	25	1.00
0.29	1.90	2.20	25	1.00
0.30	1.90	2.20	25	1.00
0.31	2.40	2.80	25	1.00
0.32	2.40	2.80	25	1.00
0.33	2.40	2.80	25	1.00
0.34	2.40	2.80	25	1.00
0.35	2.40	2.80	25	1.00
0.36	2.40	2.80	25	1.00
0.37	2.40	2.80	25	1.00
0.38	2.40	2.80	25	1.00
0.39	2.70	3.60	25	1.00
0.40	2.70	3.60	25	1.00
0.41	2.70	3.60	25	1.00
0.42	2.70	3.60	25	1.00
0.43	2.70	3.60	25	1.00
0.44	2.70	3.60	25	1.00
0.45	2.70	3.60	25	1.00
0.46	2.70	3.60	25	1.00
0.47	2.70	3.60	25	1.00
0.48	2.70	3.60	25	1.00
0.49	3.20	4.00	25	1.00
0.50	3.20	4.00	25	1.00
0.51	3.20	4.00	25	1.00
0.52	3.20	4.00	25	1.00
0.53	3.20	4.00	25	1.00
0.54	3.60	4.50	25	1.00
0.55	3.60	4.50	25	1.00
0.56	3.60	4.50	25	1.00
0.57	3.60	4.50	25	1.00
0.58	3.60	4.50	25	1.00
0.59	3.60	4.50	25	1.00
0.60	3.60	4.50	25	1.00
0.61	3.90	5.00	25	1.00
0.62	3.90	5.00	25	1.00
0.63	3.90	5.00	25	1.00
0.64	3.90	5.00	25	1.00
0.65	3.90	5.00	25	1.00
0.66	3.90	5.00	25	1.00
0.67	3.90	5.00	25	1.00
0.68	4.50	5.60	25	1.00
0.69	4.50	5.60	25	1.00
0.70	4.50	5.60	25	1.00
0.71	4.50	5.60	25	1.00
0.72	4.50	5.60	25	1.00
0.73	4.50	5.60	25	1.00
0.74	4.50	5.60	25	1.00
0.75	4.50	5.60	25	1.00
0.76	5.00	6.30	25	1.00
0.77	5.00	6.30	25	1.00
0.78	5.00	6.30	25	1.00
0.79	5.00	6.30	25	1.00
0.80	5.00	6.30	25	1.50
0.81	5.00	6.30	25	1.50
0.82	5.00	6.30	25	1.50
0.83	5.00	6.30	25	1.50
0.84	5.00	6.30	25	1.50
0.85	5.00	6.30	25	1.50
0.86	5.70	7.10	25	1.50
0.87	5.70	7.10	25	1.50
0.88	5.70	7.10	25	1.50
0.89	5.70	7.10	25	1.50
0.90	5.70	7.10	25	1.50
0.91	5.70	7.10	25	1.50
0.92	5.70	7.10	25	1.50
0.93	5.70	7.10	25	1.50
0.94	5.70	7.10	25	1.50
0.95	5.70	7.10	25	1.50
0.96	6.50	8.00	25	1.50
0.97	6.50	8.00	25	1.50
0.98	6.50	8.00	25	1.50
0.99	6.50	8.00	25	1.50
1.00	6.50	8.00	25	1.50
1.05	6.50	8.00	25	1.50
1.10	7.30	9.00	25	1.50
1.15	7.30	9.00	25	1.50
1.20	8.20	10.00	25	1.50
1.25	8.20	10.00	25	1.50
1.30	8.20	10.00	25	1.50
1.35	9.20	11.20	25	1.50
1.40	9.20	11.20	25	1.50
1.45	9.20	11.20	25	1.50
1.50	10.90	12.90	38	2.00
1.55	11.20	13.40	38	2.00
1.587	11.20	13.40	38	2.00
1.60	11.20	13.40	38	2.00
1.65	11.20	13.40	38	2.00
1.70	11.20	13.40	38	2.00
1.75	11.20	13.40	38	2.00
1.80	11.20	13.40	38	2.00
1.85	11.20	13.40	38	2.00
1.90	11.70	14.00	38	2.00
1.95	11.70	14.00	38	2.00
1.984	11.70	14.00	38	2.00
2.00	12.70	15.00	43	2.50
2.05	12.70	15.00	43	2.50
2.10	12.70	15.00	43	2.50
2.15	12.70	15.00	43	2.50
2.20	13.70	17.00	43	2.50
2.25	13.70	17.00	43	2.50
2.30	13.70	17.00	43	2.50
2.35	13.70	17.00	43	2.50
2.381	13.70	17.00	43	2.50
2.40	14.70	18.00	43	2.50
2.45	14.70	18.00	43	2.50
2.50	14.70	18.00	46	3.00
2.55	15.70	19.00	46	3.00
2.60	15.70	19.00	46	3.00
2.65	16.70	20.00	46	3.00
2.70	16.70	20.00	46	3.00
2.75	17.70	21.00	46	3.00
2.778	17.70	21.00	46	3.00
2.80	17.70	21.00	46	3.00
2.85	18.70	22.00	46	3.00
2.90	18.70	22.00	46	3.00
2.95	19.70	23.00	46	3.00
3.00	19.70	23.00	46	3.00
3.175	19.70	23.00	46	3.175

Juwelierbohrer 6 × d aus HSS-E

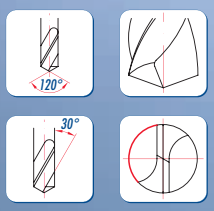
Art. 11654

Foret pour la joaillerie 6 × d en HSS-E
Punta per gioielleria 6 × d in HSS-E
Jeweller drill 6 × d in HSS-E

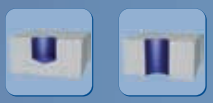
P1, 2 | K1, 2 | N5, 7, 8



HSS-E | SPHINX NORM



Z 2



In Packungen zu 10 Stück
En boîtes de 10 pièces
In contenitori da 10 pezzi
Packaged in quantities of 10 pieces

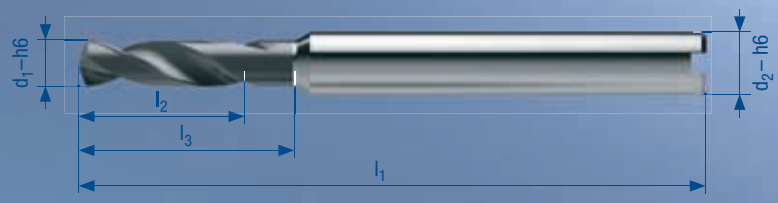
Vc → S./p. 166

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	4.00	4.50	25	1.50
0.55	4.00	4.50	25	1.50
0.60	4.50	5.00	25	1.50
0.65	5.00	5.50	25	1.50
0.70	5.00	5.50	25	1.50
0.75	5.00	5.50	25	1.50
0.80	6.00	6.50	25	1.50
0.85	6.00	6.50	25	1.50
0.90	6.00	6.50	25	1.50
0.95	6.00	6.50	25	1.50
1.00	6.00	6.50	25	1.50
1.05	7.00	7.50	25	1.50
1.10	7.00	7.50	25	1.50
1.15	7.00	7.50	25	1.50
1.20	8.00	8.50	25	1.50
1.25	8.00	8.50	25	1.50
1.30	8.00	8.50	25	1.50
1.35	8.00	8.50	25	1.50
1.40	9.00	9.50	25	1.50
1.45	9.00	9.50	25	1.50
1.50	9.00	9.50	38	2.00
1.55	9.00	9.50	38	2.00
1.60	10.00	11.00	38	2.00
1.65	10.00	11.00	38	2.00
1.70	10.00	11.00	38	2.00
1.75	10.00	11.00	38	2.00
1.80	10.00	11.00	38	2.00
1.85	12.00	13.00	38	2.00
1.90	12.00	13.00	38	2.00
1.95	12.00	13.00	38	2.00
2.00	12.00		38	2.00
2.05	14.00	15.00	43	2.50
2.10	14.00	15.00	43	2.50
2.15	14.00	15.00	43	2.50
2.20	14.00	15.00	43	2.50
2.25	14.00	15.00	43	2.50
2.30	14.00	15.00	43	2.50

Hochleistungsbohrer Phoenix-TC2 3×d Art. 52903

Foret à grand rendement Phoenix-TC2 3×d
Punta ad alto rendimento Phoenix-TC2 3×d
High performance drill Phoenix-TC2 3×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 3×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

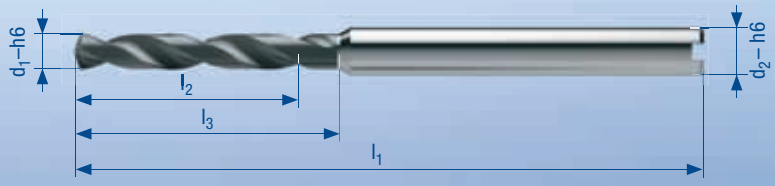
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	3.00	5.00	38	3.00
1.05	3.15	5.25	38	3.00
1.10	3.30	5.50	38	3.00
1.15	3.45	5.50	38	3.00
1.20	3.60	5.50	38	3.00
1.25	3.75	6.00	38	3.00
1.30	3.90	6.00	38	3.00
1.35	4.05	6.00	38	3.00
1.40	4.20	6.50	38	3.00
1.45	4.35	6.50	38	3.00
1.50	4.50	6.50	38	3.00
1.55	4.65	7.50	38	3.00
1.60	4.80	7.50	38	3.00
1.65	4.95	8.00	38	3.00
1.70	5.10	8.00	38	3.00
1.75	5.25	8.00	38	3.00
1.80	5.40	8.50	38	3.00
1.85	5.55	8.50	38	3.00
1.90	5.70	8.50	38	3.00
1.95	5.85	9.00	38	3.00
2.00	6.00	9.00	38	3.00
2.05	6.15	9.00	38	3.00
2.10	6.30	9.50	38	3.00
2.15	6.45	9.50	38	3.00
2.20	6.60	9.50	38	3.00
2.25	6.75	10.00	38	3.00
2.30	6.90	10.00	38	3.00
2.35	7.05	10.00	38	3.00
2.40	7.20	10.00	38	3.00
2.45	7.35	10.00	38	3.00
2.50	7.50	10.50	50	3.00
2.55	7.65	11.00	50	3.00
2.60	7.80	11.00	50	3.00
2.65	7.95	11.00	50	3.00
2.70	8.10	11.50	50	3.00
2.75	8.25	11.50	50	3.00
2.80	8.40	11.50	50	3.00
2.85	8.55	12.00	50	3.00
2.90	8.70	12.00	50	3.00
2.95	8.85	12.00	50	3.00
3.00	9.00	12.50	50	3.00

Hochleistungsbohrer Phoenix-TC2 6×d Art. 52906

Foret à grand rendement Phoenix-TC2 6×d
Punta ad alto rendimento Phoenix-TC2 6×d
High performance drill Phoenix-TC2 6×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 6×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

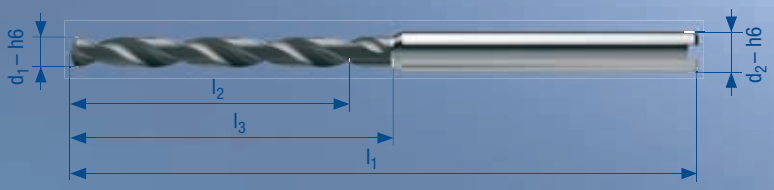
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	6.00	8.00	38	3.00
1.05	6.30	8.30	38	3.00
1.10	6.60	8.60	38	3.00
1.15	6.90	8.90	38	3.00
1.20	7.20	9.20	38	3.00
1.25	7.50	9.50	38	3.00
1.30	7.80	9.80	38	3.00
1.35	8.10	10.10	38	3.00
1.40	8.40	10.40	38	3.00
1.45	8.70	10.70	38	3.00
1.50	9.00	11.00	38	3.00
1.55	9.30	11.30	38	3.00
1.60	9.60	12.60	38	3.00
1.65	9.90	12.90	38	3.00
1.70	10.20	13.20	38	3.00
1.75	10.50	13.50	38	3.00
1.80	10.80	13.80	38	3.00
1.85	11.10	14.10	38	3.00
1.90	11.40	14.40	38	3.00
1.95	11.70	14.70	38	3.00
2.00	12.00	15.00	50	3.00
2.05	12.30	15.30	50	3.00
2.10	12.60	15.60	50	3.00
2.15	12.90	15.90	50	3.00
2.20	13.20	16.20	50	3.00
2.25	13.50	16.50	50	3.00
2.30	13.80	16.80	50	3.00
2.35	14.10	17.10	50	3.00
2.40	14.40	17.40	50	3.00
2.45	14.70	17.70	50	3.00
2.50	15.00	18.00	50	3.00
2.55	15.30	18.30	50	3.00
2.60	15.60	18.60	50	3.00
2.65	15.90	18.90	50	3.00
2.70	16.20	19.20	50	3.00
2.75	16.50	19.50	50	3.00
2.80	16.80	19.80	50	3.00
2.85	17.10	20.10	50	3.00
2.90	17.40	20.40	50	3.00
2.95	17.70	20.70	50	3.00
3.00	18.00	20.70	50	3.00

Hochleistungsbohrer Phoenix-TC2 9×d Art. 52909

Foret à grand rendement Phoenix-TC2 9×d
Punta ad alto rendimento Phoenix-TC2 9×d
High performance drill Phoenix-TC2 9×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 9×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

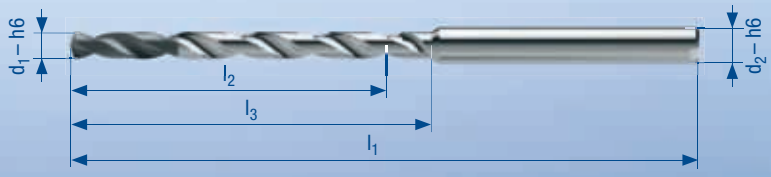
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	9.00	11.00	51	3.00
1.10	9.90	12.00	51	3.00
1.20	10.80	13.00	51	3.00
1.30	11.70	14.00	51	3.00
1.40	12.60	15.00	51	3.00
1.50	13.50	16.50	51	3.00
1.60	14.40	17.50	51	3.00
1.70	15.30	18.50	51	3.00
1.80	16.20	19.00	51	3.00
1.90	17.10	20.00	51	3.00
2.00	18.00	21.00	51	3.00
2.10	18.90	22.00	61	3.00
2.20	19.80	23.00	61	3.00
2.30	20.70	24.00	61	3.00
2.40	21.60	24.50	61	3.00
2.50	22.50	25.50	61	3.00
2.60	23.40	26.50	61	3.00
2.70	24.30	27.50	61	3.00
2.80	25.20	28.00	61	3.00
2.90	26.10	29.00	61	3.00
3.00	27.00	31.00	61	3.00

Hochleistungsbohrer Phoenix-TC2 12×d Art. 52912

Foret à grand rendement Phoenix-TC2 12×d
Punta ad alto rendimento Phoenix-TC2 12×d
High performance drill Phoenix-TC2 12×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 137° | ≈30° | 12×d | AlCrTiN

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

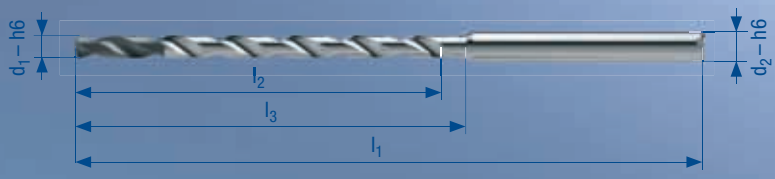
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	12.00	14.00	50	3.00
1.10	13.20	15.50	50	3.00
1.20	14.40	16.50	50	3.00
1.30	15.60	17.50	50	3.00
1.40	16.80	19.00	50	3.00
1.50	18.00	21.00	50	3.00
1.60	19.20	22.50	50	3.00
1.70	20.40	23.50	50	3.00
1.80	21.60	24.50	50	3.00
1.90	22.80	26.00	55	3.00
2.00	24.00	27.00	55	3.00
2.10	25.20	28.50	55	3.00
2.20	26.40	29.50	55	3.00
2.30	27.60	30.50	55	3.00
2.40	28.80	32.00	55	3.00
2.50	30.00	33.00	60	3.00
2.60	31.20	34.50	60	3.00
2.70	32.40	35.50	60	3.00
2.80	33.60	36.50	60	3.00
2.90	34.80	38.00	60	3.00
3.00	36.00	40.00	60	3.00

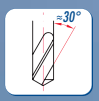
Hochleistungsbohrer Phoenix-TC2 16×d Art. 52916

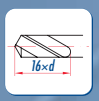
Foret à grand rendement Phoenix-TC2 16×d
Punta ad alto rendimento Phoenix-TC2 16×d
High performance drill Phoenix-TC2 16×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 16×d | AlCrTiN





mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

Vc → S./p. 179

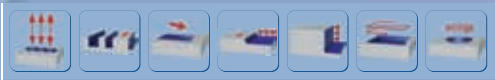
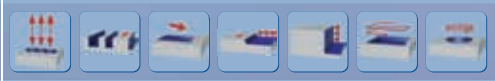
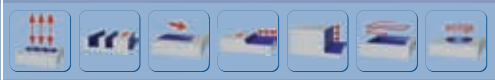
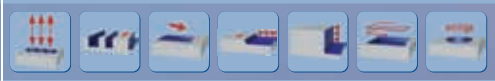
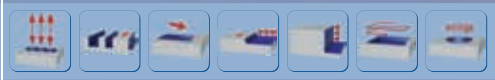
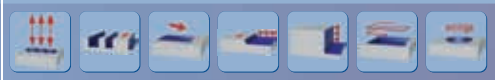
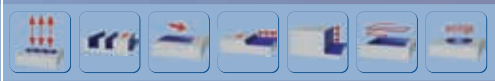
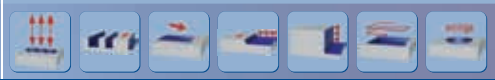
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	16.00	18.00	65	3.00
1.10	17.60	19.50	65	3.00
1.20	19.20	21.00	65	3.00
1.30	20.80	23.00	65	3.00
1.40	22.40	24.50	65	3.00
1.50	24.00	27.00	65	3.00
1.60	25.60	28.50	65	3.00
1.70	27.20	30.00	65	3.00
1.80	28.80	32.00	65	3.00
1.90	30.40	33.50	65	3.00
2.00	32.00	35.00	65	3.00
2.10	33.60	36.50	82	3.00
2.20	35.20	38.00	82	3.00
2.30	36.80	40.00	82	3.00
2.40	38.40	41.50	82	3.00
2.50	40.00	43.00	82	3.00
2.60	41.60	44.50	82	3.00
2.70	43.20	46.00	82	3.00
2.80	44.80	48.00	82	3.00
2.90	46.40	49.50	82	3.00
3.00	48.00	52.00	82	3.00

Mikrofräsen ≤ ø 3.00 mm
Microfraisage ≤ ø 3.00 mm
Microfresatura ≤ ø 3.00 mm
Micromilling ≤ ø 3.00 mm

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bearbeitungs-tiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
Gravierfräser mit verstärktem Schaft **Fraise à graver avec manche renforcé**						
	70030	0.02–0.15	0.01		30°	0°
	70040	0.02–0.15	0.01		40°	0°
	70050	0.02–0.15	0.01		50°	0°
	70060	0.02–0.15	0.01		60°	0°
	70090	0.02–0.15	0.01		90°	0°
	70130	0.04–0.10	0.01		30°	0°
	70140	0.04–0.10	0.01		40°	0°
	70150	0.04–0.10	0.01		50°	0°
	70160	0.04–0.10	0.01		60°	0°
	70190	0.04–0.10	0.01		90°	0°
Mikrofräser mit verstärktem Schaft **Micro fraise avec manche renforcé**						
	72075	0.20–2.00	0.10	0.75×ø		30°
	72150	0.10–2.00	0.10	1.5×ø		30°
	42000	0.10–3.00	0.10	3×ø		30°
	72500	0.30–2.50	0.10	5×ø		30°
	72800	0.40–2.50	0.10	8×ø		30°
	73130	0.30–2.90	0.10	1.3×ø		30°
	73200	0.30–2.90	0.10	2×ø		30°
	73300	0.30–2.90	0.10	3×ø		30°

* siehe Legende S. 192 + 193
see legend p. 192 + 193

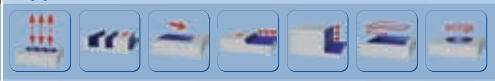
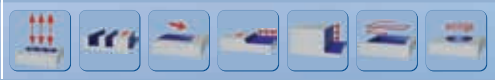
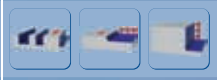
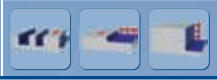
✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe * Workpiece material * P	M	K	S	N	H	O	Anwendung * Application *	Seite Page
Fresa per incidere con gambo rinforzato Engraving mill with reinforced shank									
VHM / MD / SC	✓	✓	✓	✓	✓		✓		47
VHM / MD / SC	✓	✓	✓	✓	✓		✓		48
VHM / MD / SC	✓	✓	✓	✓	✓		✓		49
VHM / MD / SC	✓	✓	✓	✓	✓		✓		50
VHM / MD / SC	✓	✓	✓	✓	✓		✓		51
VHM / MD / SC	✓	✓	✓	✓	✓		✓		52
VHM / MD / SC	✓	✓	✓	✓	✓		✓		53
VHM / MD / SC	✓	✓	✓	✓	✓		✓		54
VHM / MD / SC	✓	✓	✓	✓	✓		✓		55
VHM / MD / SC	✓	✓	✓	✓	✓		✓		56
Micro fresa con gambo rinforzato Micro end mill with reinforced shank									
VHM / MD / SC	✓	•	✓	•	✓		•		58
VHM / MD / SC	✓	•	✓	•	✓		•		59
VHM / MD / SC	✓	•	✓	•	✓		•		60
VHM / MD / SC	✓	•	✓	•	✓		•		61
VHM / MD / SC	✓	•	✓	•	✓		•		62
VHM / MD / SC	✓	•	✓	•	•				63
VHM / MD / SC	✓	•	✓	•	•				64
VHM / MD / SC	✓	•	✓	•	•				65

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bearbeitungs-tiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	
	43105	0.30 – 3.00	0.10	1×ø		35°	
	43305	0.30 – 3.00	0.10	3×ø		35°	
Radiusfräser mit verstärktem Schaft **Fraise hémisphérique avec manche renforcé**							
	74075	0.20 – 1.00	0.10	0.75×ø		30°	
	74150	0.20 – 2.00	0.10	1.5×ø		30°	
	74300	0.20 – 2.80	0.10	3×ø		30°	
Entgrat- und 1 Zahnfräser mit verstärktem Schaft **Fraise à angler et fraise 1 dent avec manche renforcé**							
	73000	0.50 – 3.00	0.50		90°	0°	
	47330	0.30 – 3.00	0.10			0°	
	47344	0.50 – 8.00	0.10			0°	

* siehe Legende S. 192 + 193
see legend p. 192 + 193

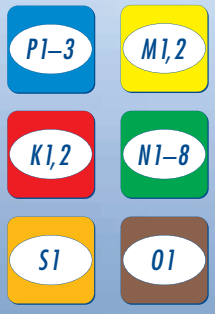
✓ hervorragend / outstanding
• geeignet / able

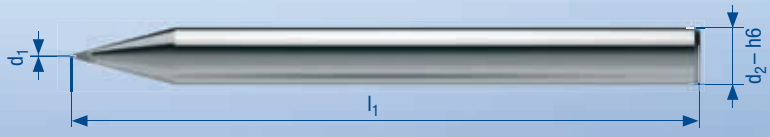
Material	Werkstoffgruppe * Workpiece material * P	M	K	S	N	H	O	Anwendung * Application *	Seite Page
VHM / MD / SC; Cro-Nova	✓	✓	•	✓	✓	•	•		66
VHM / MD / SC; Cro-Nova	✓	✓	•	✓	✓	•	•		67
Fresa a raggio con gambo rinforzato **Ball nose end mill with reinforced shank**									
VHM / MD / SC	✓	•	✓	•	✓		•		69
VHM / MD / SC	✓	•	✓	•	✓		•		70
VHM / MD / SC	✓	•	✓	•	✓		•		71
Fresa a smusso e fresa 1 dente con gambo rinforzato **Chamfering tool and end mill 1 tooth with reinforced shank**									
VHM / MD / SC	✓	•	✓	•	✓				73
VHM / MD / SC	•	•	•		✓				74
VHM / MD / SC	•	•	•		✓				75

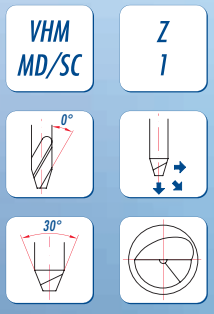
Gravierfräser 30°, mit Fläche

Art. 70030

Fraise à graver 30°, avec plat
Fresa per incidere 30°, con faccia
Engraving mill 30°, with flat







Vc → S./p. 167

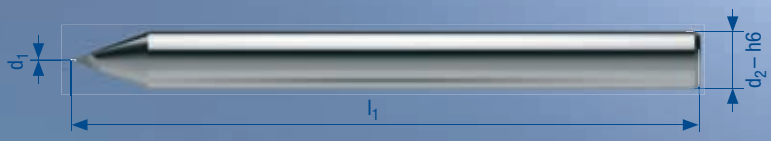
d_1 mm	α °	l_1 mm	d_2 mm
0.02	30	33	3.00
0.03	30	33	3.00
0.04	30	33	3.00
0.05	30	33	3.00
0.06	30	33	3.00
0.07	30	33	3.00
0.08	30	33	3.00
0.09	30	33	3.00
0.10	30	33	3.00
0.12	30	33	3.00
0.15	30	33	3.00

Gravierfräser 40°, mit Fläche

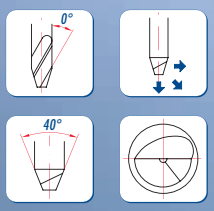
Art. 70040

Fraise à graver 40°, avec plat
Fresa per incidere 40°, con faccia
Engraving mill 40°, with flat

P1–3 | M1,2 | K1,2 | N1–8 | S1 | 01



VHM MD/SC | Z 1



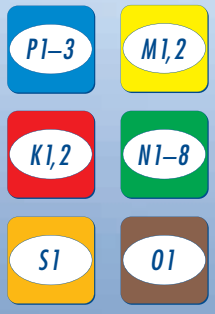
Vc → S./p. 167

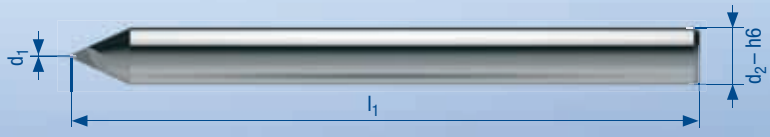
d_1 mm	α °	l_1 mm	d_2 mm
0.02	40	33	3.00
0.03	40	33	3.00
0.04	40	33	3.00
0.05	40	33	3.00
0.06	40	33	3.00
0.07	40	33	3.00
0.08	40	33	3.00
0.09	40	33	3.00
0.10	40	33	3.00
0.12	40	33	3.00
0.15	40	33	3.00

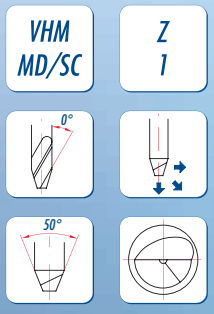
Gravierfräser 50°, mit Fläche

Art. 70050

Fraise à graver 50°, avec plat
Fresa per incidere 50°, con faccia
Engraving mill 50°, with flat







Vc → S./p. 167

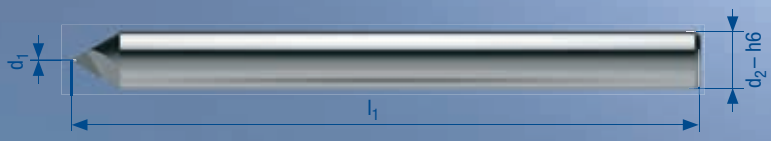
d_1 mm	α °	l_1 mm	d_2 mm
0.02	50	33	3.00
0.03	50	33	3.00
0.04	50	33	3.00
0.05	50	33	3.00
0.06	50	33	3.00
0.07	50	33	3.00
0.08	50	33	3.00
0.09	50	33	3.00
0.10	50	33	3.00
0.12	50	33	3.00
0.15	50	33	3.00

Gravierfräser 60°, mit Fläche

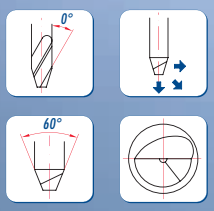
Art. 70060

Fraise à graver 60°, avec plat
Fresa per incidere 60°, con faccia
Engraving mill 60°, with flat

P1–3 | M1,2 | K1,2 | N1–8 | S1 | 01



VHM MD/SC | Z 1



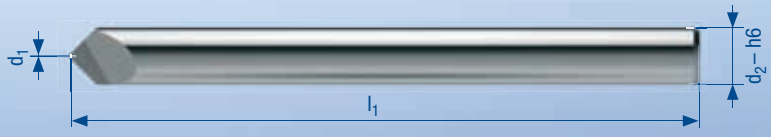
Vc → S./p. 167

d_1 mm	α °	l_1 mm	d_2 mm
0.02	60	33	3.00
0.03	60	33	3.00
0.04	60	33	3.00
0.05	60	33	3.00
0.06	60	33	3.00
0.07	60	33	3.00
0.08	60	33	3.00
0.09	60	33	3.00
0.10	60	33	3.00
0.12	60	33	3.00
0.15	60	33	3.00

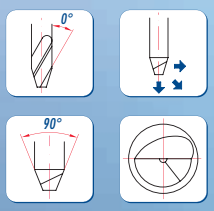
Gravierfräser 90°, mit Fläche
Fraise à graver 90°, avec plat
Fresa per incidere 90°, con faccia
Engraving mill 90°, with flat

Art. 70090

P1–3 | M1,2 | K1,2 | N1–8 | S1 | 01



VHM MD/SC | Z 1



Vc → S./p. 167

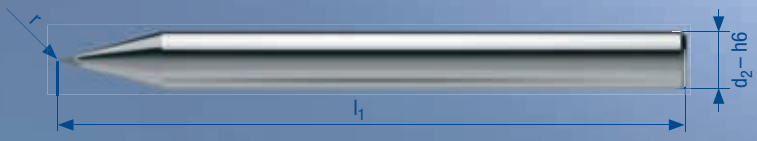
d_1 mm	α °	l_1 mm	d_2 mm
0.02	90	33	3.00
0.03	90	33	3.00
0.04	90	33	3.00
0.05	90	33	3.00
0.06	90	33	3.00
0.07	90	33	3.00
0.08	90	33	3.00
0.09	90	33	3.00
0.10	90	33	3.00
0.12	90	33	3.00
0.15	90	33	3.00

Gravierfräser 30°, mit Radius

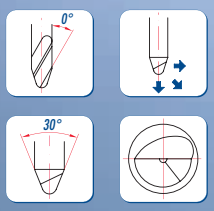
Art. 70130

Fraise à graver 30°, à rayon
Fresa per incidere 30°, con raggio
Engraving mill 30°, with radius

P1–3 | M1,2 | K1,2 | N1–8 | S1 | 01



VHM MD/SC | Z 1



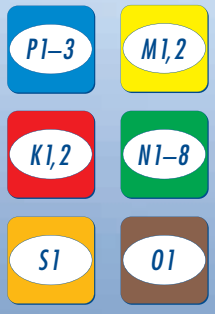
Vc → S./p. 167

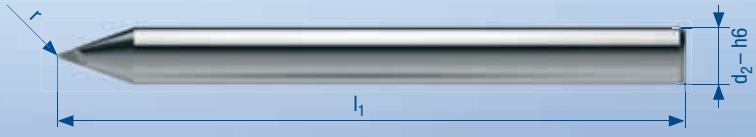
r mm	α °	l_1 mm	d_2 mm
0.04	30	33	3.00
0.05	30	33	3.00
0.06	30	33	3.00
0.07	30	33	3.00
0.08	30	33	3.00
0.09	30	33	3.00
0.10	30	33	3.00

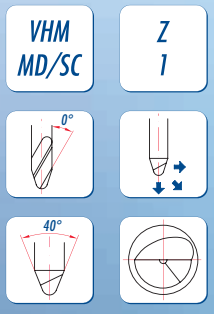
Gravierfräser 40°, mit Radius

Art. 70140

Fraise à graver 40°, à rayon
Fresa per incidere 40°, con raggio
Engraving mill 40°, with radius







Vc → S./p. 167

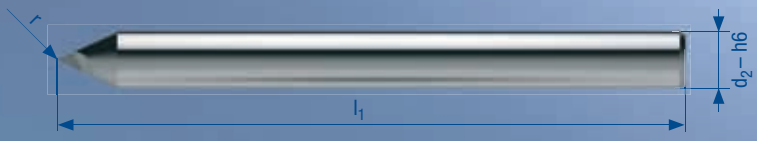
r mm	α °	l_1 mm	d_2 mm
0.04	40	33	3.00
0.05	40	33	3.00
0.06	40	33	3.00
0.07	40	33	3.00
0.08	40	33	3.00
0.09	40	33	3.00
0.10	40	33	3.00

Gravierfräser 50°, mit Radius

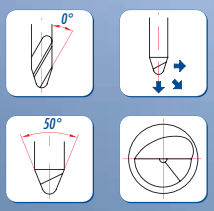
Art. 70150

Fraise à graver 50°, à rayon
Fresa per incidere 50°, con raggio
Engraving mill 50°, with radius

P1–3 | M1,2 | K1,2 | N1–8 | S1 | 01



VHM MD/SC | Z 1



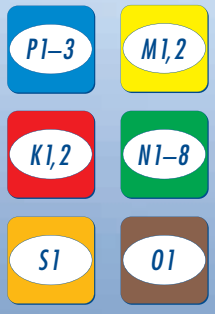
Vc → S./p. 167

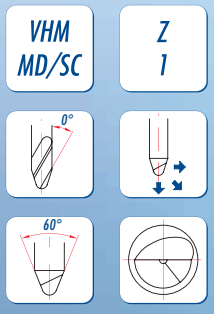
r mm	α °	l_1 mm	d_2 mm
0.04	50	33	3.00
0.05	50	33	3.00
0.06	50	33	3.00
0.07	50	33	3.00
0.08	50	33	3.00
0.09	50	33	3.00
0.10	50	33	3.00

Gravierfräser 60°, mit Radius

Art. 70160

Fraise à graver 60°, à rayon
Fresa per incidere 60°, con raggio
Engraving mill 60°, with radius





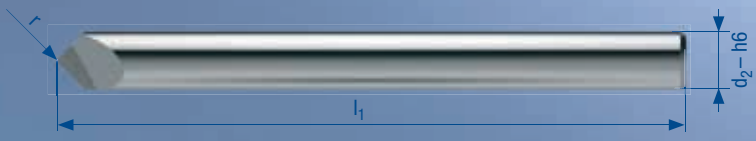
Vc → S./p. 167

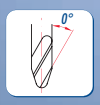
r mm	α °	l_1 mm	d_2 mm
0.04	60	33	3.00
0.05	60	33	3.00
0.06	60	33	3.00
0.07	60	33	3.00
0.08	60	33	3.00
0.09	60	33	3.00
0.10	60	33	3.00

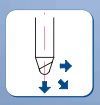
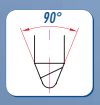
Gravierfräser 90°, mit Radius

Art. 70190

Fraise à graver 90°, à rayon
Fresa per incidere 90°, con raggio
Engraving mill 90°, with radius





Vc → S./p. 167

r mm	α °	l_1 mm	d_2 mm
0.04	90	33	3.00
0.05	90	33	3.00
0.06	90	33	3.00
0.07	90	33	3.00
0.08	90	33	3.00
0.09	90	33	3.00
0.10	90	33	3.00

Mikrofräser 0.75 × d 30 °

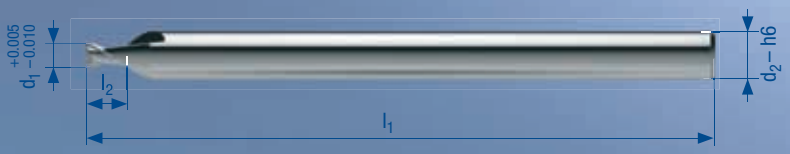
Art. 72075

Micro fraise 0.75 × d 30 °

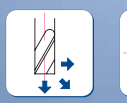
Micro fresa 0.75 × d 30 °

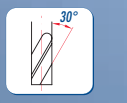
Micro end mill 0.75 × d 30 °

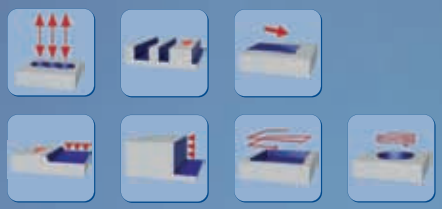
P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1 | O1



VHM MD/SC | Z 2







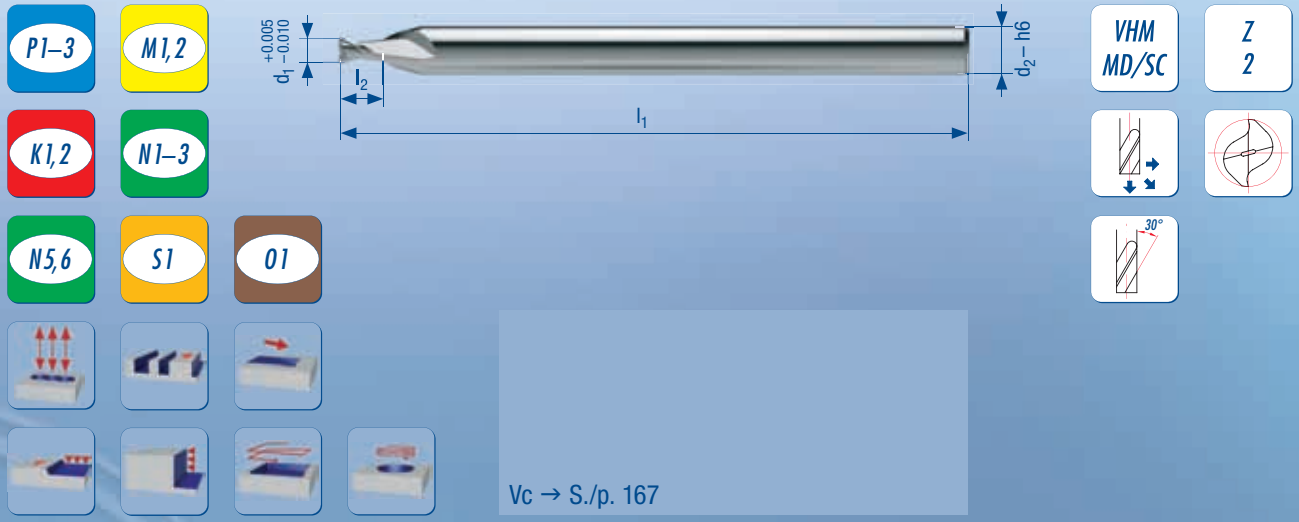
Vc → S./p. 167

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.15	39	3.00
0.30	0.25	39	3.00
0.40	0.30	39	3.00
0.50	0.37	39	3.00
0.60	0.45	39	3.00
0.70	0.53	39	3.00
0.80	0.60	39	3.00
0.90	0.70	39	3.00
1.00	0.75	39	3.00
1.10	0.90	39	3.00
1.20	0.90	39	3.00
1.30	1.00	39	3.00
1.40	1.10	39	3.00
1.50	1.15	39	3.00
1.60	1.20	39	3.00
1.70	1.30	39	3.00
1.80	1.40	39	3.00
1.90	1.45	39	3.00
2.00	1.50	39	3.00

Mikrofräser 1.5 × d 30 °

Art. 72150

Microfraise 1.5 × d 30 °
Microfresa 1.5 × d 30 °
Micro end mill 1.5 × d 30 °



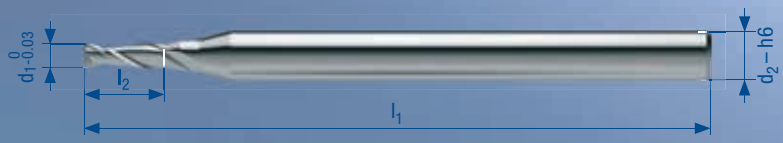
Vc → S./p. 167

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.10	0.15	39	3.00
0.15	0.20	39	3.00
0.20	0.30	39	3.00
0.25	0.35	39	3.00
0.30	0.45	39	3.00
0.40	0.60	39	3.00
0.50	0.75	39	3.00
0.60	0.90	39	3.00
0.70	1.05	39	3.00
0.80	1.20	39	3.00
0.90	1.35	39	3.00
1.00	1.50	39	3.00
1.10	1.65	39	3.00
1.20	1.80	39	3.00
1.30	1.95	39	3.00
1.40	2.10	39	3.00
1.50	2.25	39	3.00
1.60	2.40	39	3.00
1.70	2.55	39	3.00
1.80	2.70	39	3.00
1.90	2.85	39	3.00
2.00	3.00	39	3.00

Mikrofräser 3 × d 30 °
Microfraise 3 × d 30 °
Microfresa 3 × d 30 °
Micro end mill 3 × d 30 °

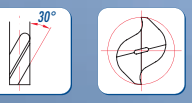
Art. 42000

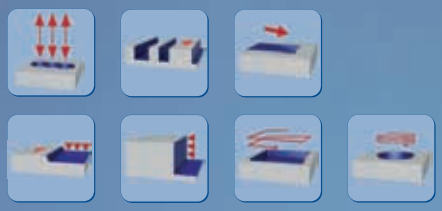
P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1 | O1



VHM MD/SC | SPHINX NORM

Z 2





Vc → S./p. 168

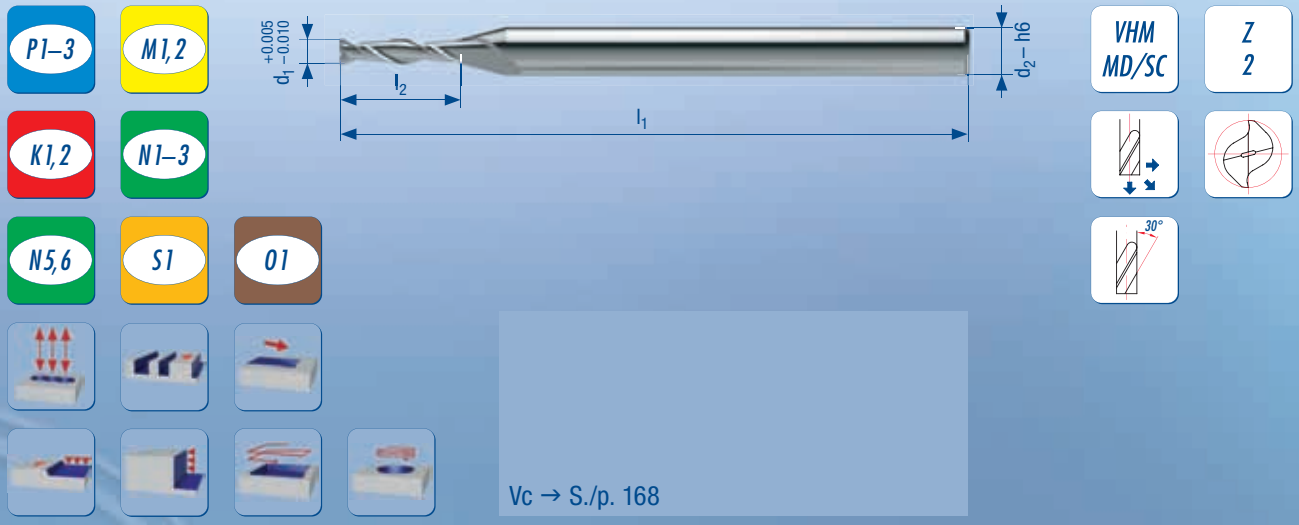
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.10	0.30	38.00	3.00
0.15	0.45	38.00	3.00
0.20	0.60	38.00	3.00
0.25	0.75	38.00	3.00
0.30	0.90	38.00	3.00
0.35	1.05	38.00	3.00
0.40	1.10	38.00	3.00
0.45	1.35	38.00	3.00
0.50	1.50	38.00	3.00
0.55	1.65	38.00	3.00
0.60	1.70	38.00	3.00
0.65	1.95	38.00	3.00
0.70	2.10	38.00	3.00
0.75	2.25	38.00	3.00
0.80	2.40	38.00	3.00
0.85	2.55	38.00	3.00
0.90	2.70	38.00	3.00
0.95	2.85	38.00	3.00
1.00	3.00	38.00	3.00
1.05	3.10	38.00	3.00
1.10	3.30	38.00	3.00
1.15	3.40	38.00	3.00
1.20	3.60	38.00	3.00
1.25	3.70	38.00	3.00
1.30	3.90	38.00	3.00
1.35	4.00	38.00	3.00
1.40	4.20	38.00	3.00
1.45	4.30	38.00	3.00
1.50	4.50	38.00	3.00
1.55	4.60	38.00	3.00
1.60	4.80	38.00	3.00
1.65	4.90	38.00	3.00
1.70	5.10	38.00	3.00
1.75	5.20	38.00	3.00
1.80	5.40	38.00	3.00
1.85	5.50	38.00	3.00
1.90	5.70	38.00	3.00
1.95	5.80	38.00	3.00

d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	6.00	38.00	3.00
2.10	6.30	38.00	3.00
2.20	6.60	38.00	3.00
2.30	6.90	38.00	3.00
2.40	7.20	38.00	3.00
2.50	7.50	38.00	3.00
2.60	7.80	38.00	3.00
2.70	8.10	38.00	3.00
2.80	8.40	38.00	3.00
2.90	8.70	38.00	3.00
3.00	9.00	38.00	3.00

Mikrofräser 5 × d 30 °

Art. 72500

Microfraise 5 × d 30 °
Microfresa 5 × d 30 °
Micro end mill 5 × d 30 °



Vc → S./p. 168

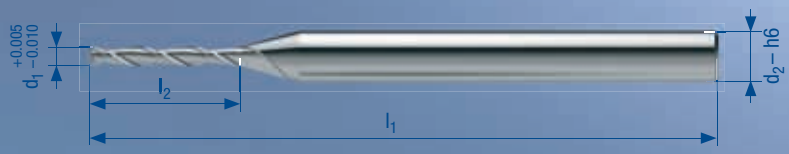
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	1.50	39	3.00
0.40	2.00	39	3.00
0.50	2.50	39	3.00
0.60	3.00	39	3.00
0.70	3.50	39	3.00
0.80	4.00	39	3.00
0.90	4.50	39	3.00
1.00	5.00	39	3.00
1.10	5.50	39	3.00
1.20	6.00	39	3.00
1.50	7.50	39	3.00
2.00	10.00	39	3.00
2.50	12.50	39	3.00

Mikrofräser 8 × d 30 °

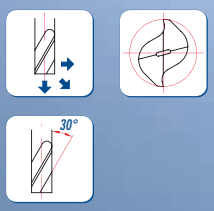
Microfraise 8 × d 30 °
Microfresa 8 × d 30 °
Micro end mill 8 × d 30 °

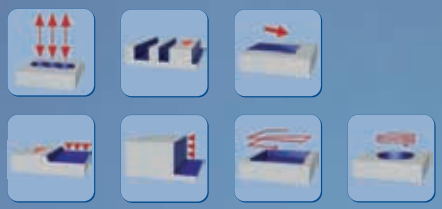
Art. 72800

P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1 | O1



VHM MD/SC | Z 2





Vc → S./p. 168

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.40	3.20	39	3.00
0.50	4.00	39	3.00
0.60	5.00	39	3.00
0.70	5.60	39	3.00
0.80	6.00	39	3.00
0.90	7.20	39	3.00
1.00	8.00	39	3.00
1.20	9.00	39	3.00
1.50	12.00	50	4.00
2.00	16.00	50	4.00
2.50	20.00	50	4.00

Mikrofräser 1.30 × d 30 °

Art. 73130

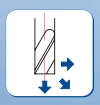
Microfraise 1.30 × d 30 °

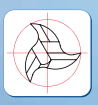
Microfresa 1.30 × d 30 °

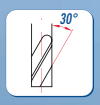
Micro end mill 1.30 × d 30 °

P1–3 | M1,2 | K1,2 | N2,3 | N5,6 | S1

VHM MD/SC | Z 3







Vc → S./p. 169

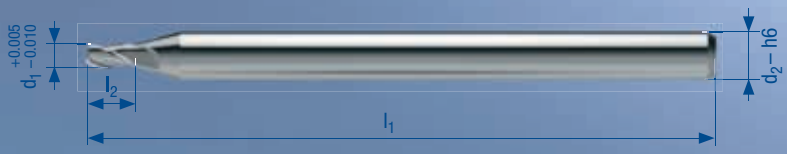
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.40	39	3.00
0.40	0.50	39	3.00
0.45	0.60	39	3.00
0.50	0.70	39	3.00
0.60	0.80	39	3.00
0.70	0.90	39	3.00
0.80	1.00	39	3.00
0.90	1.30	39	3.00
1.00	1.30	39	3.00
1.10	1.50	39	3.00
1.20	1.60	39	3.00
1.30	1.80	39	3.00
1.40	1.80	39	3.00
1.50	2.00	39	3.00
1.60	2.00	39	3.00
1.70	2.00	39	3.00
1.80	2.40	39	3.00
1.90	2.40	39	3.00
2.00	2.60	39	3.00
2.20	3.00	39	3.00
2.50	3.30	39	3.00
2.80	3.50	39	3.00
2.90	3.50	39	3.00

Mikrofräser 2 × d 30 °

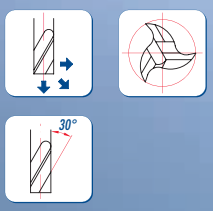
Micro fraise 2 × d 30 °
Micro fresa 2 × d 30 °
Micro end mill 2 × d 30 °

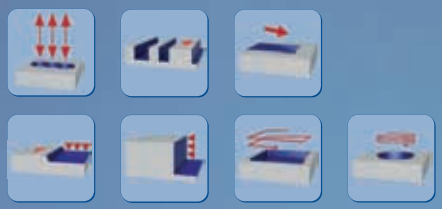
Art. 73200

P1–3 | M1,2 | K1,2 | N2,3 | N5,6 | S1



VHM MD/SC | Z 3





Vc → S./p. 169

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.60	39	3.00
0.40	0.80	39	3.00
0.50	1.00	39	3.00
0.60	1.20	39	3.00
0.70	1.40	39	3.00
0.75	1.50	39	3.00
0.80	1.60	39	3.00
0.90	1.80	39	3.00
1.00	2.00	39	3.00
1.10	2.20	39	3.00
1.20	2.40	39	3.00
1.30	2.60	39	3.00
1.40	2.80	39	3.00
1.50	3.00	39	3.00
1.60	3.20	39	3.00
1.70	3.40	39	3.00
1.80	3.60	39	3.00
1.90	3.80	39	3.00
2.00	4.00	39	3.00
2.10	4.20	39	3.00
2.20	4.40	39	3.00
2.30	4.60	39	3.00
2.40	4.80	39	3.00
2.50	5.00	39	3.00
2.60	5.20	39	3.00
2.70	5.40	39	3.00
2.80	5.60	39	3.00
2.90	5.80	39	3.00

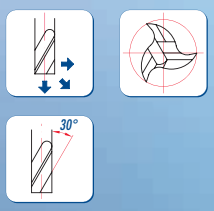
Mikrofräser 3 × d 30 °

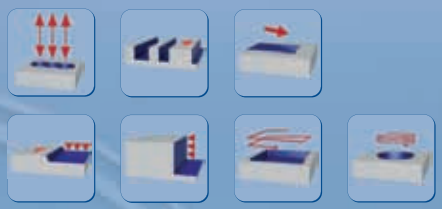
Micro fraise 3 × d 30 °
Micro fresa 3 × d 30 °
Micro end mill 3 × d 30 °

Art. 73300

P1–3 | M1,2 | K1,2 | N2,3 | N5,6 | S1

VHM MD/SC | Z 3





Vc → S./p. 169

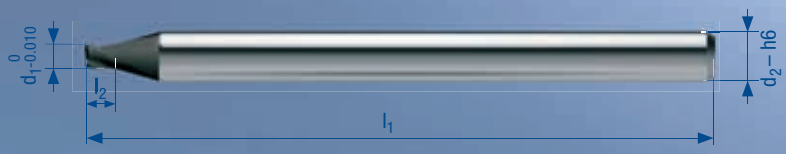
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.90	39	3.00
0.40	1.20	39	3.00
0.50	1.50	39	3.00
0.60	2.00	39	3.00
0.70	2.00	39	3.00
0.75	2.00	39	3.00
0.80	2.50	39	3.00
0.90	2.50	39	3.00
1.00	3.00	39	3.00
1.10	3.30	39	3.00
1.20	4.00	39	3.00
1.30	4.00	39	3.00
1.40	4.00	39	3.00
1.50	4.50	39	3.00
1.60	4.50	39	3.00
1.70	5.00	39	3.00
1.80	6.00	39	3.00
1.90	6.00	39	3.00
2.00	6.00	39	3.00
2.10	6.00	39	3.00
2.20	6.50	39	3.00
2.30	7.00	39	3.00
2.40	7.00	39	3.00
2.50	7.50	39	3.00
2.60	7.50	39	3.00
2.70	8.00	39	3.00
2.80	8.00	39	3.00
2.90	8.50	39	3.00

Mikrofräser 1 × d 35 °

Microfraise 1 × d 35 °
Microfresa 1 × d 35 °
Micro end mill 1 × d 35 °

Art. 43105

P1–3 | M1,2 | K1,2 | N1–8 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Z 3 | 35° | Cro-Nova

Vc → S./p. 169

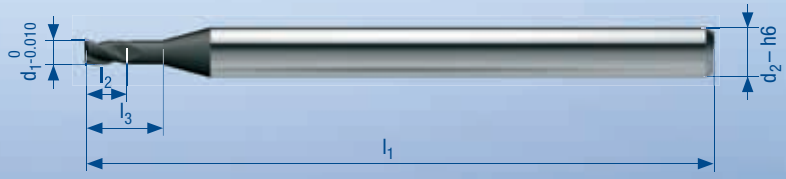
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.30	38.00	3.00
0.40	0.40	38.00	3.00
0.50	0.50	38.00	3.00
0.60	0.60	38.00	3.00
0.70	0.70	38.00	3.00
0.80	0.80	38.00	3.00
0.90	0.90	38.00	3.00
1.00	1.00	38.00	3.00
1.10	1.10	38.00	3.00
1.20	1.20	38.00	3.00
1.30	1.30	38.00	3.00
1.40	1.40	38.00	3.00
1.50	1.50	38.00	3.00
1.60	1.60	38.00	3.00
1.70	1.70	38.00	3.00
1.80	1.80	38.00	3.00
1.90	1.90	38.00	3.00
2.00	2.00	38.00	3.00
2.10	2.10	38.00	3.00
2.20	2.20	38.00	3.00
2.30	2.30	38.00	3.00
2.40	2.40	38.00	3.00
2.50	2.50	38.00	3.00
2.60	2.60	38.00	3.00
2.70	2.70	38.00	3.00
2.80	2.80	38.00	3.00
2.90	2.90	38.00	3.00
3.00	3.00	38.00	3.00

Mikrofräser 3 × d 35 °

Micro fraise 3 × d 35 °
Micro fresa 3 × d 35 °
Micro end mill 3 × d 35 °

Art. 43305

P1–3 | M1,2 | K1,2 | N1–8 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Z 3 | 35° | Cro-Nova

Vc → S./p. 170

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.30	0.30	0.90	38.00	3.00
0.40	0.40	1.20	38.00	3.00
0.50	0.50	1.50	38.00	3.00
0.60	0.60	1.80	38.00	3.00
0.70	0.70	2.10	38.00	3.00
0.80	0.80	2.40	38.00	3.00
0.90	0.90	2.70	38.00	3.00
1.00	1.00	3.00	38.00	3.00
1.10	1.10	3.30	38.00	3.00
1.20	1.20	3.60	38.00	3.00
1.30	1.30	3.90	38.00	3.00
1.40	1.40	4.20	38.00	3.00
1.50	1.50	4.50	38.00	3.00
1.60	1.60	4.80	38.00	3.00
1.70	1.70	5.10	38.00	3.00
1.80	1.80	5.40	38.00	3.00
1.90	1.90	5.70	38.00	3.00
2.00	2.00	6.00	38.00	3.00
2.10	2.10	6.30	38.00	3.00
2.20	2.20	6.60	38.00	3.00
2.30	2.30	6.90	38.00	3.00
2.40	2.40	7.20	38.00	3.00
2.50	2.50	7.50	38.00	3.00
2.60	2.60	7.80	38.00	3.00
2.70	2.70	8.10	38.00	3.00
2.80	2.80	8.40	38.00	3.00
2.90	2.90	8.70	38.00	3.00
3.00	3.00	9.00	38.00	3.00

Radiusfräser 0.75 × d
Fraise hémisphérique 0.75 × d
Fresa a raggio 0.75 × d
Ball nose end mill 0.75 × d

Art. 74075

P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1 | O1

VHM MD/SC | SPHINX NORM | Z 2

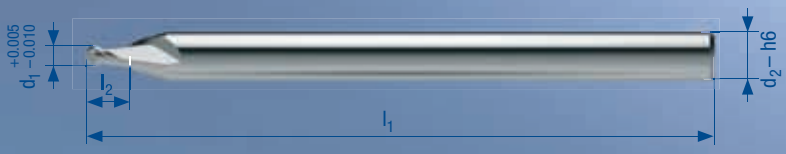
Vc → S./p. 170

d_1 mm	r mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.10	0.15	39	3.00
0.30	0.15	0.20	39	3.00
0.40	0.20	0.30	39	3.00
0.50	0.25	0.37	39	3.00
0.60	0.30	0.45	39	3.00
0.80	0.40	0.60	39	3.00
1.00	0.50	0.75	39	3.00

Radiusfräser 1.5 × d
Fraise hémisphérique 1.5 × d
Fresa a raggio 1.5 × d
Ball nose end mill 1.5 × d

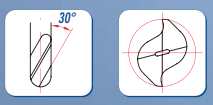
Art. 74150

P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1 | 01



VHM MD/SC | SPHINX NORM

Z 2

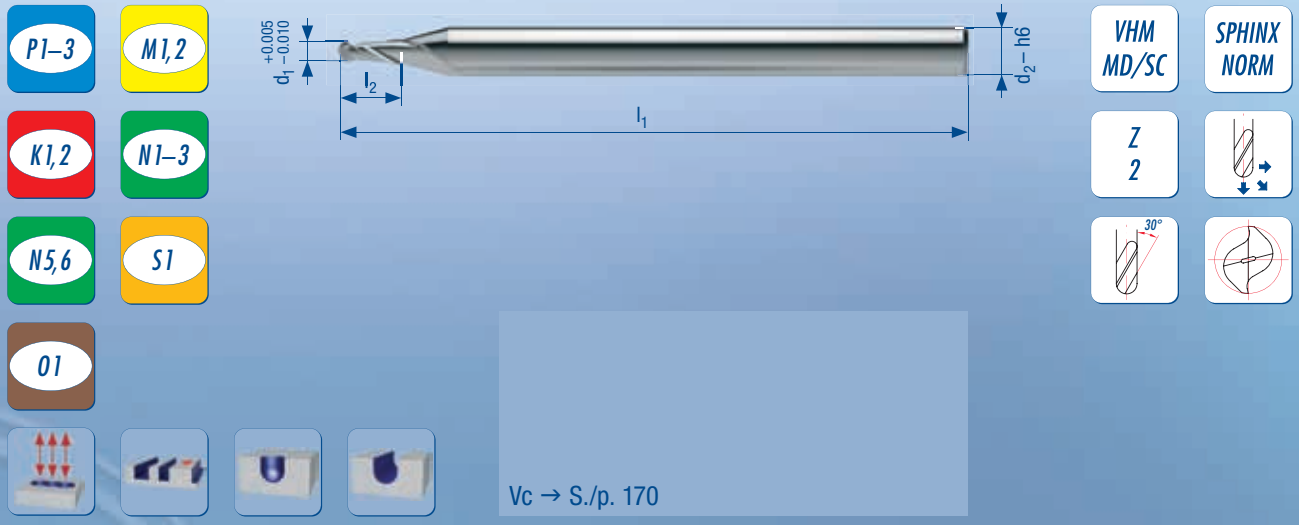


Vc → S./p. 170

d_1 mm	r mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.100	0.30	39	3.00
0.25	0.125	0.35	39	3.00
0.30	0.150	0.45	39	3.00
0.40	0.200	0.60	39	3.00
0.50	0.250	0.75	39	3.00
0.60	0.300	0.90	39	3.00
0.70	0.350	1.05	39	3.00
0.80	0.400	1.20	39	3.00
0.90	0.450	1.35	39	3.00
1.00	0.500	1.50	39	3.00
1.10	0.550	1.65	39	3.00
1.20	0.600	1.80	39	3.00
1.30	0.650	1.95	39	3.00
1.40	0.700	2.10	39	3.00
1.50	0.750	2.25	39	3.00
1.60	0.800	2.40	39	3.00
1.80	0.900	2.70	39	3.00
2.00	1.000	3.00	39	3.00

Radiusfräser 3 × d
Fraise hémisphérique 3 × d
Fresa a raggio 3 × d
Ball nose end mill 3 × d

Art. 74300



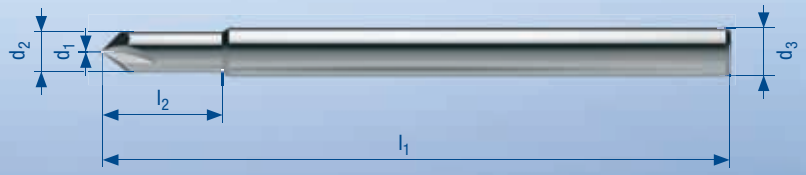
Vc → S./p. 170

d_1 mm	r mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.10	0.60	39	3.00
0.30	0.15	1.00	39	3.00
0.40	0.20	1.00	39	3.00
0.50	0.25	1.50	39	3.00
0.60	0.30	1.50	39	3.00
0.70	0.35	2.00	39	3.00
0.80	0.40	2.00	39	3.00
0.90	0.45	2.50	39	3.00
1.00	0.50	3.00	39	3.00
1.20	0.60	4.00	39	3.00
1.40	0.70	4.00	39	3.00
1.50	0.75	4.00	39	3.00
1.60	0.80	4.00	39	3.00
1.80	0.90	5.50	39	3.00
2.00	1.00	6.00	39	3.00
2.10	1.05	6.00	39	3.00
2.20	1.10	6.00	39	3.00
2.50	1.25	7.50	39	3.00
2.80	1.40	8.40	39	3.00

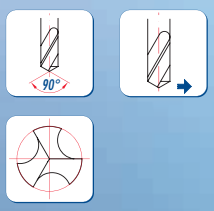
Entgratfräser 90 °
Fraise à angler 90 °
Fresa a smusso 90 °
Chamfering tool 90 °

Art. 73000

P1–3 | M1,2 | K1,2 | N1–3,5 | S1 | 01



VHM MD/SC | Z 3

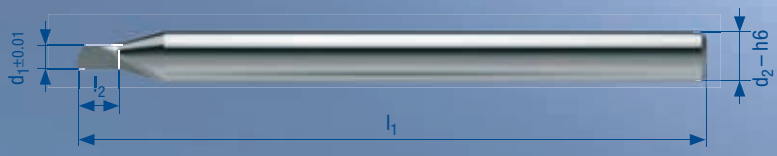


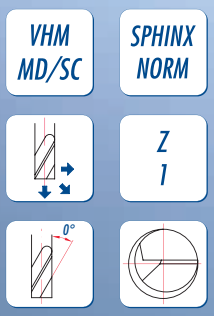
Vc → S./p. 171

d_1 mm	d_2 mm	l_2 mm	l_1 mm	d_3 mm
0.10	0.50	3.00	39	3.00
0.10	1.00	3.00	39	3.00
0.10	1.50	4.50	39	3.00
0.10	2.00	6.00	39	3.00
0.10	2.50	7.50	39	3.00
0.10	3.00	7.50	39	3.00

Gerade genuteter Fräser – 1 Zahn ¾ Art. 47330

Fraise taille droite – 1 dent ¾
Fresa taglio diritto – 1 dente ¾
Straight fluted end mill – 1 tooth ¾





Vc → S./p. 171

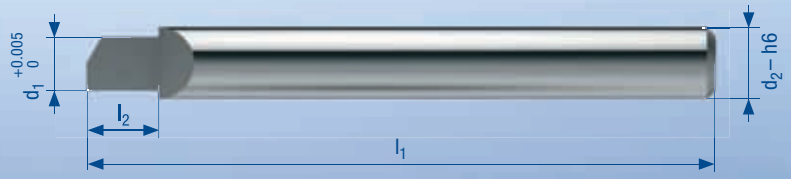
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	1.20	38	3.00
0.40	1.20	38	3.00
0.50	1.50	38	3.00
0.60	1.50	38	3.00
0.70	1.50	38	3.00
0.80	1.50	38	3.00
0.90	1.50	38	3.00
1.00	2.00	38	3.00
1.05	2.00	38	3.00
1.10	2.00	38	3.00
1.15	2.00	38	3.00
1.20	2.00	38	3.00
1.25	2.00	38	3.00
1.30	2.00	38	3.00
1.35	2.00	38	3.00
1.40	2.00	38	3.00
1.45	2.00	38	3.00
1.50	2.00	38	3.00
1.55	2.50	38	3.00
1.60	2.50	38	3.00
1.65	2.50	38	3.00
1.70	2.50	38	3.00
1.75	2.50	38	3.00
1.80	2.50	38	3.00
1.85	2.50	38	3.00
1.90	2.50	38	3.00
1.95	2.50	38	3.00
2.00	2.50	38	3.00
2.10	3.00	38	3.00
2.20	3.00	38	3.00
2.30	3.00	38	3.00
2.40	3.00	38	3.00
2.50	3.50	38	3.00
2.60	3.50	38	3.00
2.70	3.50	38	3.00
2.80	3.50	38	3.00
2.90	3.50	38	3.00
3.00	4.00	38	3.00

Gerade genuteter Fräser – 1 Zahn

Fraise taille droite – 1 dent
Fresa taglio diritto – 1 dente
Straight fluted end mill – 1 tooth

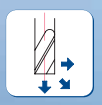
Art. 47344

N 5, 7, 8

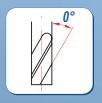


VHM MD/SC

SPHINX NORM



Z 1



Fläche poliert
Face polie miroir
Superficie lucidata
Surface polished

Vc → S./p. 172

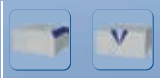
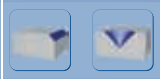
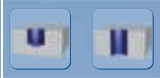
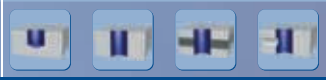
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.50	1.50	30	3.00
0.60	1.50	30	3.00
0.70	1.50	30	3.00
0.80	2.00	30	3.00
0.90	2.00	30	3.00
1.00	2.00	30	3.00
1.10	2.00	30	3.00
1.20	2.00	30	3.00
1.30	2.00	30	3.00
1.40	2.00	30	3.00
1.50	2.00	30	3.00
1.60	2.50	30	3.00
1.70	2.50	30	3.00
1.80	2.50	30	3.00
1.90	2.50	30	3.00
2.00	2.50	30	3.00
2.10	3.00	30	3.00
2.20	3.00	30	3.00
2.30	3.00	30	3.00
2.40	3.00	30	3.00
2.50	3.00	30	3.00
2.60	3.00	30	3.00
2.70	3.00	30	3.00
2.80	3.00	30	3.00
2.90	3.00	30	3.00
3.00	4.00	35	4.00

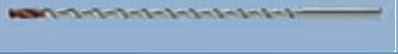
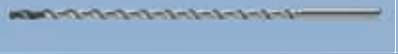
Bohren – Reiben
Perçage – Alesage
Forare – Alesare
Drilling – Reaming

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
NC-Anbohrer und Zentriersenker Foret à pointer et chanfrainer						
	50806	0.50–6.00	0.10		60°+/- 1°	20°
	50810	2.00–20.00	1.00		90°+/- 1°	20°
	50812	2.00–20.00	1.00		120°	20°
	50814	2.00–20.00	1.00		142°	20°
	50818	1.60–12.00	0.40		142°/90°	20°
Spiralbohrer ohne Innenkühlung Foret hélicoïdal sans trou d'huile						
	50950	3.00–20.00	0.10	3×ø	140°	30°
	50830	0.30–20.00	0.10	5×ø	118°	35°
	50838	0.30–6.00	0.05	6×ø	118°	30°–35°
	50820	0.70–14.00	0.10	10×ø	130°	35°–15°
Hochleistungsbohrer mit verstärktem Schaft mit Innenkühlung Foret à grand rendement avec manche renforcé avec trou d'huile						
	50938	1.00–12.70	0.10	3×ø	140°	30°
	50940	1.00–12.70	0.05	6×ø	140°	30°
	50942	1.00–12.70	0.10	12×ø	140°	30°
	52100	3.00–20.00	0.50	6×ø	140°	0°
	52200	3.00–20.00	0.50	12×ø	140°	0°
	52150	4.00–20.00	0.50	6×ø	140°	15°

* siehe Legende S. 192 + 193
see legend p. 192 + 193

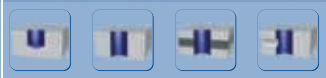
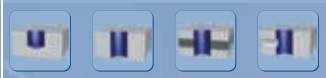
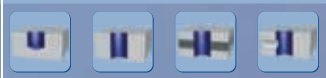
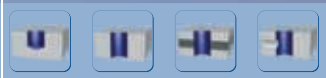
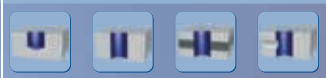
✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe * Workpiece material * P	M	K	S	N	H	O	Anwendung * Application *	Seite Page
Punta a centrare e smusso **NC spotting drill and chamfering drill**									
VHM / MD / SC	✓	✓	✓	•	✓		✓		85
VHM / MD / SC	✓	✓	✓	•	✓		✓		86
VHM / MD / SC	✓	✓	✓	•	✓		✓		87
VHM / MD / SC	✓	✓	✓	•	✓		✓		88
VHM / MD / SC	✓	✓	✓	•	✓		✓		89
Punta elicoidale senza fori di lubrificazione **Twist drill without internal coolant**									
VHM / MD / SC; TiAlN	✓	•	✓	•	•	•	•		91
VHM / MD / SC	✓	✓	•	•	✓		✓		92
VHM / MD / SC	✓	✓	•	•	✓		✓		93
VHM / MD / SC	✓		✓		•				94
Punta ad alto rendimento con gambo rinforzato con fori di lubrificazione **High performance drill with reinforced shank with internal coolant**									
VHM / MD / SC; AlCrN	✓	✓	✓	•	•				96
VHM / MD / SC; TiAlN	✓	✓	✓	•	•				97
VHM / MD / SC; AlCrN	✓	•	✓	•	•				99
VHM / MD / SC			✓		✓		•		100
VHM / MD / SC			✓		✓		•		101
VHM / MD / SC; TiAlN	✓		✓		•	•			102

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
Hochleistungsbohrer Power Phoenix mit verstärktem Schaft mit Innenkühlung **Foret à grand rendement Power-Phoenix avec manche renforcé avec trou d'huile**						
	50909	1.00–12.70	0.10	9×ø	140°	30°
	50912	1.00–12.70	0.10	12×ø	137°	30°
	50916	1.00–12.70	0.10	16×ø	137°	30°
	50920	3.00–10.00	1.00	20×ø	137°	30°
	50925	3.00–10.00	1.00	25×ø	137°	30°
	50930	3.00–10.00	1.00	30×ø	137°	30°
Hochleistungsbohrer Phoenix-TC2 mit verstärktem Schaft mit Innenkühlung **Foret à grand rendement Phoenix-TC2 avec manche renforcé avec trou d'huile**						
	52903	1.00–10.00	0.05	3×ø	140°	30°
	52906	1.00–10.00	0.05	6×ø	140°	30°
	52909	1.00–10.00	0.10	9×ø	140°	30°
	52912	1.00–10.00	0.10	12×ø	137°	30°
	52916	1.00–10.00	0.10	16×ø	137°	30°
	52920	3.00–10.00	1.00	20×ø	137°	30°
	52930	3.00–10.00	1.00	30×ø	137°	30°
Hochleistungsbohrer Phoenix-TC4 mit verstärktem Schaft mit Innenkühlung **Foret à grand rendement Phoenix-TC4 avec manche renforcé avec trou d'huile**						
	54906	3.00–10.00	0.10	6×ø	140°	30°
	54909	3.00–10.00	0.10	9×ø	140°	30°
	54912	3.00–10.00	0.10	12×ø	137°	30°
	54916	3.00–10.00	0.10	16×ø	137°	30°

* siehe Legende S. 192 + 193
see legend p. 192 + 193

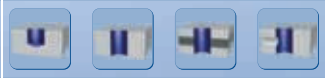
✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe * Workpiece material * P	M	K	S	N	H	O	Anwendung * Application *	Seite Page
Punta ad alto rendimento Power-Phoenix con gambo rinforzato con fori di lubrificazione High performance drill Power-Phoenix with reinforced shank with internal coolant									
VHM / MD / SC; AlCrN	✓	✓	✓	•	✓		•		104
VHM / MD / SC; AlCrN	✓		✓		•				105
VHM / MD / SC; AlCrN	✓		✓		•				106
VHM / MD / SC; AlCrN	✓		✓		•				107
VHM / MD / SC; AlCrN	✓		✓		•				108
VHM / MD / SC; AlCrN	✓		✓		•				109
Punta ad alto rendimento Phoenix-TC2 con gambo rinforzato con fori di lubrificazione High performance drill Phoenix-TC2 with reinforced shank with internal coolant									
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		111
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		112
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		113
VHM / MD / SC; AlCrN; AlCrTiN	✓	✓	✓	✓	✓	•	•		114
VHM / MD / SC; AlCrN; AlCrTiN	✓	✓	✓	✓	✓	•	•		115
VHM / MD / SC; AlCrTiN	•	✓	•	✓	✓	•	•		116
VHM / MD / SC; AlCrTiN	•	✓	•	✓	✓	•	•		117
Punta ad alto rendimento Phoenix-TC4 con gambo rinforzato con fori di lubrificazione High performance drill Phoenix-TC4 with reinforced shank with internal coolant									
VHM / MD / SC; AlTiCrN+S	✓		✓		•				119
VHM / MD / SC; AlTiCrN+S	✓		✓		•				120
VHM / MD / SC; AlCrTiN	✓		✓		•				121
VHM / MD / SC; AlCrTiN	✓		✓		•				122

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	
	54920	3.00–10.00	1.00 und M	20×ø	137°	30°	
	54930	3.00–10.00	1.00 und M	30×ø	137°	30°	
Bohrreibahlen und Reibahlen Foret alésoir et alésoir							
	50840	2.00–14.00	0.10	–5×ø	118°	35°	
	55654	1.00–14.00	0.10	–5×ø	118°	35°	
	55338	1.00–14.00	0.10	–10×ø	118°	35°	
	58000	0.99–6.00	0.01	–8×ø		10°	
	58500	0.99–6.00	0.01	–8×ø		10°	

* siehe Legende S. 192 + 193
see legend p. 192 + 193

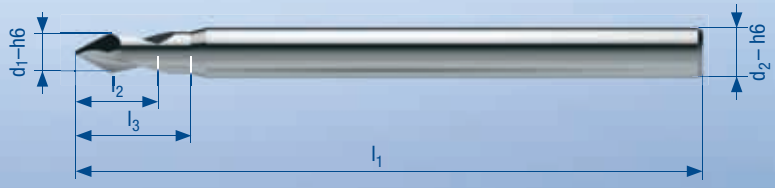
✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe * Workpiece material * P	M	K	S	N	H	O	Anwendung * Application *	Seite Page
VHM / MD / SC; AlCrTiN	✓		✓		•				123
VHM / MD / SC; AlCrTiN	✓		✓		•				124
Punta alesatore e alesatore **Drill reamer and reamer**									
VHM / MD / SC	•	•	•	•	✓				126
VHM / MD / SC	✓	•	✓	•	•				127
VHM / MD / SC	✓	•	✓	•	•				128
VHM / MD / SC	✓	✓	✓	•	✓				129
VHM / MD / SC	✓	✓	✓	•	✓				130

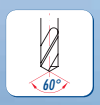
NC-Anbohrer und Anfaser 60° Art. 50806

Foret à pointer NC et chanfreiner 60°
Punta a centrare NC e smusso 60°
NC spotting drill and chamfering 60°

P1–3 | M1,2 | K1,2 | N1–5 | N7,8 | S1 | 01

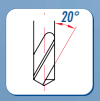


VHM MD/SC | SPHINX NORM



Typ N

Z 2



Vc → S./p. 160

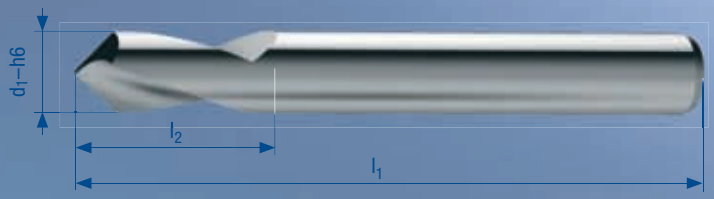
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	1.50	2.00	38	3.00
0.60	1.50	2.00	38	3.00
0.70	1.50	2.00	38	3.00
0.80	2.00	2.50	38	3.00
0.90	2.00	2.50	38	3.00
1.00	2.00	2.50	38	3.00
1.10	2.50	3.50	38	3.00
1.20	2.50	3.50	38	3.00
1.30	2.50	3.50	38	3.00
1.40	3.00	4.00	38	3.00
1.50	3.00	4.00	38	3.00
1.60	3.00	4.00	38	3.00
1.70	4.00	5.00	38	3.00
1.80	4.00	5.00	38	3.00
1.90	4.00	5.00	38	3.00
2.00	5.00	6.00	38	3.00
2.10	5.00	6.00	38	3.00
2.20	5.00	6.00	38	3.00
2.30	6.00	7.00	38	3.00
2.40	6.00	7.00	38	3.00
2.50	6.00	7.00	38	3.00
2.60	7.00	8.00	38	3.00
2.70	7.00	8.00	38	3.00
2.80	7.00	8.00	38	3.00
2.90	7.00	8.00	38	3.00
3.00	9.50	9.50	38	3.00
4.00	10.50	10.50	40	4.00
5.00	16.00	16.00	50	5.00
6.00	16.00	16.00	50	6.00

NC-Anbohrer 90 °

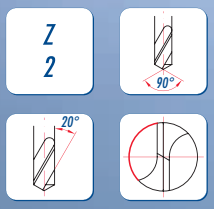
Foret à pointer NC 90°
Punta a centrare NC 90°
NC spotting drill 90°

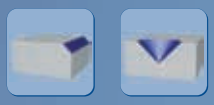
Art. 50810

P1–3 | M1,2 | K1,2 | N1–8 | 01



VHM MD/SC | SPHINX NORM | Z 2





Vc → S./p. 172

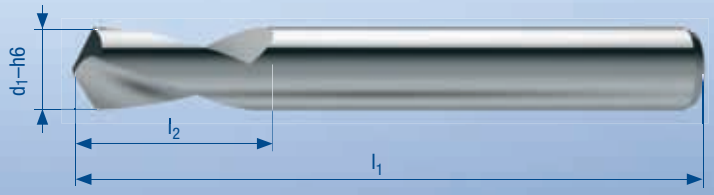
d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70
12.00	22.00	70
14.00	25.00	75
16.00	25.00	75
20.00	35.00	75

NC-Anbohrer 120 °

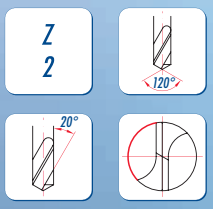
Foret à pointer NC 120°
Punta a centrare NC 120°
NC spotting drill 120°

Art. 50812

P1–3 | M1,2 | K1,2 | N1–8 | 01



VHM MD/SC | SPHINX NORM | Z 2



Vc → S./p. 172

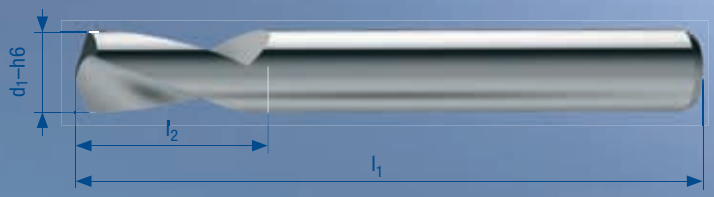
d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70
12.00	22.00	70
14.00	25.00	75
16.00	25.00	75
20.00	35.00	75

NC-Anbohrer 142 °

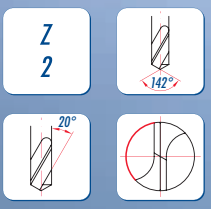
Foret à pointer NC 142°
Punta a centrare NC 142°
NC spotting drill 142°

Art. 50814

P1–3 | M1,2 | K1,2 | N1–8 | 01



VHM MD/SC | SPHINX NORM | Z 2



Vc → S./p. 172

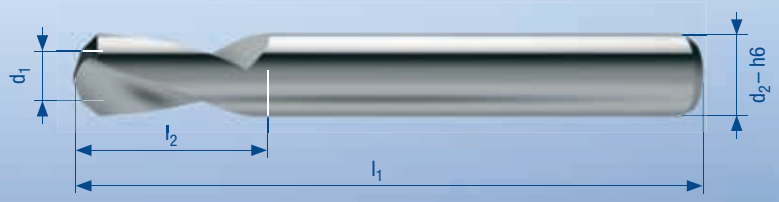
d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70
12.00	22.00	70
14.00	25.00	75
16.00	25.00	75
20.00	35.00	75

Zentriersenker 142°/90°

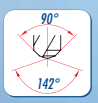
Art. 50818

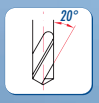
Foret à pointer et chanfreiner 142°/90°
Punta da centro e smusso 142°/90°
Spotting and chamfering drill 142°/90°

P1–3 | M1,2 | K1,2 | N1–8 | 01



VHM MD/SC | SPHINX NORM | Z 2





Vc → S./p. 172

d_1 mm	l_2 mm	l_1 mm	d_2 mm
1.60	9.50	32	3.00
2.00	9.50	32	3.00
2.50	10.50	40	4.00
3.00	10.50	40	4.00
3.30	16.00	50	5.00
4.00	16.00	50	5.00

d_1 mm	l_2 mm	l_1 mm	d_2 mm
4.20	16.00	50	6.00
5.00	20.00	60	8.00
6.00	20.00	60	8.00
6.80	22.00	70	10.00
7.00	22.00	70	10.00
8.00	22.00	70	10.00

d_1 mm	l_2 mm	l_1 mm	d_2 mm
8.50	22.00	70	12.00
9.00	22.00	70	12.00
10.00	22.00	70	12.00
10.20	25.00	75	14.00
11.00	25.00	75	14.00
12.00	25.00	75	16.00

Spiralbohrer Fastcut 3 × d

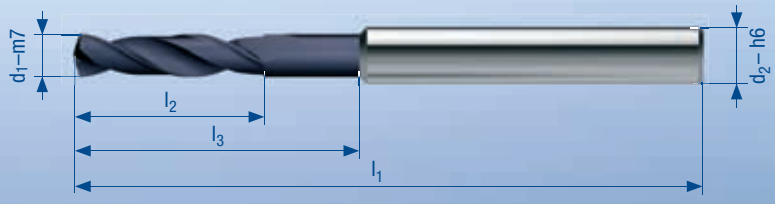
Foret hélicoïdal Fastcut 3 × d

Punta elicoidale Fastcut 3 × d

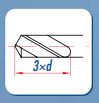
Twist drill Fastcut 3 × d

Art. 50950

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1–3



VHM MD/SC | DIN 6537 | Typ N | Z 2 | TiAlN



Vc → S./p. 173

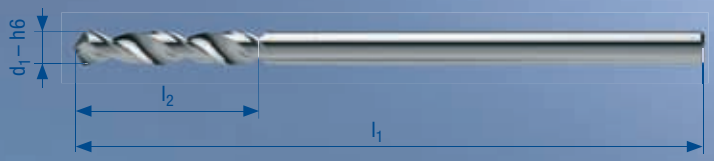
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	14.00	20.00	62	6.00
3.10	14.00	20.00	62	6.00
3.20	14.00	20.00	62	6.00
3.30	14.00	20.00	62	6.00
3.40	14.00	20.00	62	6.00
3.50	14.00	20.00	62	6.00
3.60	14.00	20.00	62	6.00
3.70	14.00	20.00	62	6.00
3.80	17.00	24.00	66	6.00
3.90	17.00	24.00	66	6.00
4.00	17.00	24.00	66	6.00
4.10	17.00	24.00	66	6.00
4.20	17.00	24.00	66	6.00
4.30	17.00	24.00	66	6.00
4.40	17.00	24.00	66	6.00
4.50	17.00	24.00	66	6.00
4.60	17.00	24.00	66	6.00
4.70	17.00	24.00	66	6.00
4.80	20.00	28.00	66	6.00
4.90	20.00	28.00	66	6.00
5.00	20.00	28.00	66	6.00
5.10	20.00	28.00	66	6.00
5.20	20.00	28.00	66	6.00
5.30	20.00	28.00	66	6.00
5.40	20.00	28.00	66	6.00
5.50	20.00	28.00	66	6.00
5.60	20.00	28.00	66	6.00
5.70	20.00	28.00	66	6.00
5.80	20.00	28.00	66	6.00
5.90	20.00	28.00	66	6.00
6.00	20.00	28.00	66	6.00
6.10	24.00	34.00	79	8.00
6.20	24.00	34.00	79	8.00
6.30	24.00	34.00	79	8.00
6.40	24.00	34.00	79	8.00
6.50	24.00	34.00	79	8.00
6.60	24.00	34.00	79	8.00
6.70	24.00	34.00	79	8.00
6.80	24.00	34.00	79	8.00
6.90	24.00	34.00	79	8.00
7.00	24.00	34.00	79	8.00
7.10	29.00	41.00	79	8.00
7.20	29.00	41.00	79	8.00
7.30	29.00	41.00	79	8.00
7.40	29.00	41.00	79	8.00
7.50	29.00	41.00	79	8.00
7.60	29.00	41.00	79	8.00
7.70	29.00	41.00	79	8.00
7.80	29.00	41.00	79	8.00
7.90	29.00	41.00	79	8.00
8.00	29.00	41.00	79	8.00
8.10	35.00	47.00	89	10.00
8.20	35.00	47.00	89	10.00
8.30	35.00	47.00	89	10.00
8.40	35.00	47.00	89	10.00
8.50	35.00	47.00	89	10.00
8.60	35.00	47.00	89	10.00
8.70	35.00	47.00	89	10.00
8.80	35.00	47.00	89	10.00
8.90	35.00	47.00	89	10.00
9.00	35.00	47.00	89	10.00
9.10	35.00	47.00	89	10.00
9.20	35.00	47.00	89	10.00
9.30	35.00	47.00	89	10.00
9.40	35.00	47.00	89	10.00
9.50	35.00	47.00	89	10.00
9.60	35.00	47.00	89	10.00
9.70	35.00	47.00	89	10.00
9.80	35.00	47.00	89	10.00
9.90	35.00	47.00	89	10.00
10.00	35.00	47.00	89	10.00
10.10	40.00	55.00	102	12.00
10.20	40.00	55.00	102	12.00
10.30	40.00	55.00	102	12.00
10.40	40.00	55.00	102	12.00
10.50	40.00	55.00	102	12.00
10.60	40.00	55.00	102	12.00
10.70	40.00	55.00	102	12.00
10.80	40.00	55.00	102	12.00
10.90	40.00	55.00	102	12.00
11.00	40.00	55.00	102	12.00
11.10	40.00	55.00	102	12.00
11.20	40.00	55.00	102	12.00
11.30	40.00	55.00	102	12.00
11.40	40.00	55.00	102	12.00
11.50	40.00	55.00	102	12.00
11.60	40.00	55.00	102	12.00
11.70	40.00	55.00	102	12.00
11.80	40.00	55.00	102	12.00
11.90	40.00	55.00	102	12.00
12.00	40.00	55.00	102	12.00
12.50	43.00	60.00	107	14.00
12.80	43.00	60.00	107	14.00
13.00	43.00	60.00	107	14.00
13.50	43.00	60.00	107	14.00
13.80	43.00	60.00	107	14.00
14.00	43.00	60.00	107	14.00
14.50	45.00	65.00	115	16.00
14.80	45.00	65.00	115	16.00
15.00	45.00	65.00	115	16.00
15.50	45.00	65.00	115	16.00
15.80	45.00	65.00	115	16.00
16.00	45.00	65.00	115	16.00
16.50	51.00	73.00	123	18.00
17.00	51.00	73.00	123	18.00
17.50	51.00	73.00	123	18.00
18.00	51.00	73.00	123	18.00
18.50	55.00	79.00	131	20.00
18.80	55.00	79.00	131	20.00
19.00	55.00	79.00	131	20.00
19.50	55.00	79.00	131	20.00
19.80	55.00	79.00	131	20.00
20.00	55.00	79.00	131	20.00

Spiralbohrer P osicut 5 × d

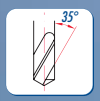
Foret hélicoïdal Posicut 5 × d
Punta elicoidale Posicut 5 × d
Twist drill Posicut 5 × d

Art. 50830

P1,2 | M1,2 | K1,2 | N1–4 | N6–8 | S1,2 | 01



VHM MD/SC | DIN 6539 | Typ N | Z 2



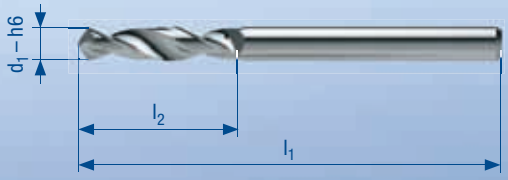
Vc → S./p. 173

d_1 mm	l_2 mm	l_1 mm
0.30	1.50	19
0.40	2.30	19
0.50	2.80	20
0.60	3.30	21
0.70	4.30	23
0.80	4.80	24
0.90	5.30	25
1.00	5.70	26
1.10	6.70	28
1.20	7.70	30
1.30	7.70	30
1.40	8.70	32
1.50	8.70	32
1.60	9.70	34
1.70	9.70	34
1.80	10.70	36
1.90	10.70	36
2.00	11.50	38
2.10	11.50	38
2.20	12.50	40
2.30	12.50	40
2.40	13.50	43
2.50	13.50	43
2.60	13.50	43
2.70	15.50	46
2.80	15.50	46
2.90	15.50	46
3.00	15.50	46
3.10	17.50	49
3.20	17.50	49
3.30	17.50	49
3.40	19.50	52
3.50	19.50	52
3.60	19.50	52
3.70	19.50	52
3.80	21.50	55
3.90	21.50	55
4.00	21.50	55
4.10	21.50	55
4.20	21.50	55
4.30	23.00	58
4.40	23.00	58
4.50	23.00	58
4.60	23.00	58
4.70	23.00	58
4.80	25.00	62
4.90	25.00	62
5.00	25.00	62
5.10	25.00	62
5.20	25.00	62
5.30	25.00	62
5.40	27.00	66
5.50	27.00	66
5.60	27.00	66
5.70	27.00	66
5.80	27.00	66
5.90	27.00	66
6.00	27.00	66
6.10	30.00	70
6.20	30.00	70
6.30	30.00	70
6.40	30.00	70
6.50	30.00	70
6.60	30.00	70
6.70	30.00	70
6.80	33.00	74
6.90	33.00	74
7.00	33.00	74
7.10	33.00	74
7.20	33.00	74
7.30	33.00	74
7.40	33.00	74
7.50	33.00	74
7.60	36.00	79
7.70	36.00	79
7.80	36.00	79
7.90	36.00	79
8.00	36.00	79
8.10	36.00	79
8.20	36.00	79
8.30	36.00	79
8.40	36.00	79
8.50	36.00	79
8.60	39.00	84
8.70	39.00	84
8.80	39.00	84
8.90	39.00	84
9.00	39.00	84
9.10	39.00	84
9.20	39.00	84
9.30	39.00	84
9.40	39.00	84
9.50	39.00	84
9.60	41.00	89
9.70	41.00	89
9.80	41.00	89
9.90	41.00	89
10.00	41.00	89
10.20	41.00	89
10.50	41.00	89
11.00	45.00	95
11.50	45.00	95
12.00	49.00	102
12.50	49.00	102
13.00	49.00	102
13.50	52.00	107
14.00	52.00	107
15.00	54.00	111
16.00	56.00	115
17.00	58.00	119
18.00	60.00	123
19.00	62.00	127
20.00	64.00	131

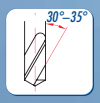
Spiralbohrer Spirec 5 × d
Foret hélicoïdal Spirec 5 × d
Punta elicoidale Spirec 5 × d
Twist drill Spirec 5 × d

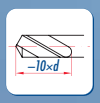
Art. 50838

P1,2 | M1,2 | K1,2 | N1–6 | S1



VHM MD/SC | SPHINX NORM | Typ N | Z 2





Vc → S./p. 174

d_1 mm	l_2 mm	l_1 mm
0.30	3.70	38
0.35	3.70	38
0.40	4.70	38
0.45	4.70	38
0.50	5.70	38
0.55	5.70	38
0.60	7.70	38
0.65	7.70	38
0.70	9.70	38
0.75	9.70	38
0.80	11.70	38
0.85	11.70	38
0.90	14.70	38
0.95	14.70	38
1.00	14.70	38
1.05	14.70	38
1.10	14.70	38
1.15	14.70	38
1.20	14.70	38
1.25	14.70	38
1.30	14.70	38
1.35	14.70	38
1.40	14.70	38
1.45	14.70	38
1.50	14.70	38
1.55	14.70	38
1.60	14.70	38
1.65	14.70	38
1.70	14.70	38
1.75	14.70	38
1.80	14.70	38
1.85	14.70	38
1.90	14.70	38
1.95	14.70	38
2.00	14.70	38
2.05	14.70	38
2.10	14.70	38
2.15	14.70	38

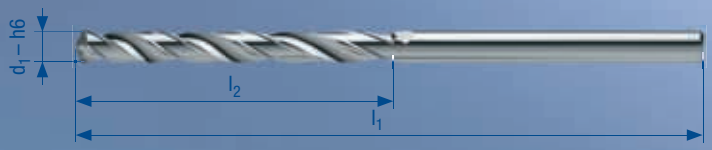
d_1 mm	l_2 mm	l_1 mm
2.20	14.70	38
2.25	14.70	38
2.30	14.70	38
2.35	14.70	38
2.40	14.70	38
2.45	14.70	38
2.50	14.70	38
2.55	14.70	38
2.60	14.70	38
2.65	14.70	38
2.70	14.70	38
2.75	14.70	38
2.80	14.70	38
2.85	14.70	38
2.90	14.70	38
2.95	14.70	38
3.00	14.70	38
3.05	14.70	38
3.10	14.70	38
3.15	14.70	38
3.175	14.70	38
3.20	19.70	50
3.30	19.70	50
3.40	19.70	50
3.50	19.70	50
3.60	19.70	50
3.70	19.70	50
3.80	19.70	50
3.90	19.70	50
4.00	19.70	50
4.10	24.70	50
4.20	24.70	50
4.30	24.70	50
4.40	24.70	50
4.50	24.70	50
4.60	24.70	50
4.70	24.70	50
4.80	24.70	50

d_1 mm	l_2 mm	l_1 mm
4.90	24.70	50
5.00	24.70	50
5.10	24.70	50
5.20	24.70	50
5.30	24.70	50
5.40	24.70	50
5.50	24.70	50
5.60	24.70	50
5.70	24.70	50
5.80	24.70	50
5.90	24.70	50
6.00	24.70	50

Spiralbohrer S picut 10 × d
Foret hélicoïdal Spicut 10 × d
Punta elicoidale Spicut 10 × d
Twist drill Spicut 10 × d

Art. 50820

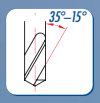
P1,2 K1,2 N2,3,5

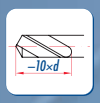


VHM MD/SC | DIN 338

H7 – H9

Z 2





Ab ø 2 mm mit 4 Führungsfasen
A partir de ø 2 mm avec 4 listel
A partire da ø 2 mm con 4 pattini di guida
From ø 2 mm with 4 guide margins

Vc → S./p. 174

d_1 mm	l_2 mm	l_1 mm
0.70	8	28
0.80	9	30
0.90	10	32
1.00	11	34
1.10	13	36
1.20	15	38
1.30	15	38
1.40	17	40
1.50	17	40
1.60	19	43
1.70	19	43
1.80	21	46
1.90	21	46
2.00	23	49
2.10	23	49
2.20	26	53
2.30	26	53
2.40	29	57
2.50	29	57
2.60	29	57
2.70	31	61
2.80	31	61
2.90	31	61
3.00	31	61
3.10	34	65
3.20	34	65
3.30	34	65
3.40	37	70
3.50	37	70
3.60	37	70
3.70	37	70
3.80	41	75
3.90	41	75
4.00	41	75
4.10	41	75
4.20	41	75
4.30	45	80
4.40	45	80

d_1 mm	l_2 mm	l_1 mm
4.50	45	80
4.60	45	80
4.70	45	80
4.80	50	86
4.90	50	86
5.00	50	86
5.10	50	86
5.20	50	86
5.30	50	86
5.40	55	93
5.50	55	93
5.60	55	93
5.70	55	93
5.80	55	93
5.90	55	93
6.00	55	93
6.10	61	101
6.20	61	101
6.30	61	101
6.40	61	101
6.50	61	101
6.60	61	101
6.70	61	101
6.80	67	109
6.90	67	109
7.00	67	109
7.10	67	109
7.20	67	109
7.30	67	109
7.40	67	109
7.50	67	109
7.60	73	117
7.70	73	117
7.80	73	117
7.90	73	117
8.00	73	117
8.10	73	117
8.20	73	117

d_1 mm	l_2 mm	l_1 mm
8.30	73	117
8.40	73	117
8.50	73	117
8.60	78	125
8.70	78	125
8.80	78	125
8.90	78	125
9.00	78	125
9.10	78	125
9.20	78	125
9.30	78	125
9.40	78	125
9.50	78	125
9.60	84	133
9.70	84	133
9.80	84	133
9.90	84	133
10.00	84	133
10.20	84	133
10.50	84	133
11.00	91	142
11.50	91	142
12.00	98	151
12.50	98	151
13.00	98	151
13.50	105	160
14.00	105	160

Hochleistungsbohrer Phoenix 3×d

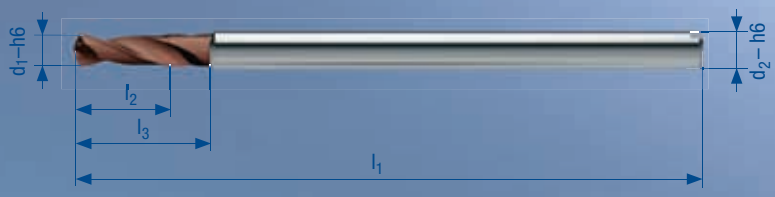
Art. 50938

Foret à grand rendement Phoenix 3×d

Punta ad alto rendimento Phoenix 3×d

High performance drill Phoenix 3×d

P1–3 | M1,2 | K1,2 | N2,3 | S1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 3×d | AlCrN

Innenkühlung ab ø 2.50 mm
Trou d'huile à partir du ø 2.50 mm
Fori di lubrificazione a partire dal ø 2.50 mm
Internal coolant from ø 2.50 mm

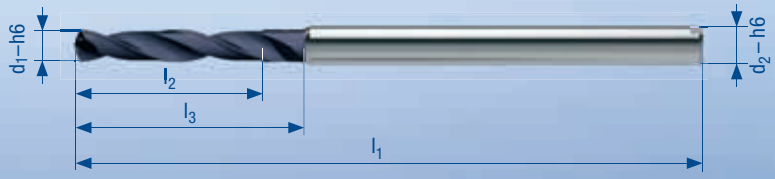
Vc → S./p. 175

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	3.00	5.00	38	3.00
1.10	3.30	5.50	38	3.00
1.20	3.60	5.50	38	3.00
1.30	3.90	6.00	38	3.00
1.40	4.20	6.00	38	3.00
1.50	4.50	6.50	38	3.00
1.60	4.80	7.50	38	3.00
1.70	5.10	8.00	38	3.00
1.80	5.40	8.50	38	3.00
1.90	5.70	8.50	38	3.00
2.00	6.00	9.00	38	3.00
2.10	6.30	9.50	38	3.00
2.20	6.60	9.50	38	3.00
2.30	6.90	10.00	38	3.00
2.40	7.20	10.00	38	3.00
2.50	7.50	10.50	50	3.00
2.60	7.80	11.00	50	3.00
2.70	8.10	11.50	50	3.00
2.80	8.40	11.50	50	3.00
2.90	8.70	12.00	50	3.00
3.00	9.00	12.50	50	3.00
3.10	9.30	13.50	55	6.00
3.20	9.60	13.50	55	6.00
3.30	9.90	13.50	55	6.00
3.40	10.20	14.00	55	6.00
3.50	10.50	14.50	55	6.00
3.60	10.80	15.00	55	6.00
3.70	11.10	15.00	55	6.00
3.80	11.40	15.50	55	6.00
3.90	11.70	15.50	55	6.00
4.00	12.00	16.00	55	6.00
4.10	12.30	18.50	60	6.00
4.20	12.60	18.50	60	6.00
4.30	12.90	19.00	60	6.00
4.40	13.20	19.00	60	6.00
4.50	13.50	20.50	60	6.00
4.60	13.80	22.00	60	6.00
4.70	14.10	22.00	60	6.00
4.80	14.40	22.50	60	6.00
4.90	14.70	22.50	60	6.00
5.00	15.00	23.00	60	6.00
5.10	15.30	23.50	64	6.00
5.20	15.60	23.50	64	6.00
5.30	15.90	24.00	64	6.00
5.40	16.20	24.00	64	6.00
5.50	16.50	24.50	64	6.00
5.60	16.80	24.50	64	6.00
5.70	17.10	25.50	64	6.00
5.80	17.40	25.50	64	6.00
5.90	17.70	25.50	64	6.00
6.00	18.00	27.00	64	6.00
6.10	18.30	27.50	68	8.00
6.20	18.60	27.50	68	8.00
6.30	18.90	28.00	68	8.00
6.40	19.20	28.00	68	8.00
6.50	19.50	28.50	68	8.00
6.60	19.80	29.00	68	8.00
6.70	20.10	29.50	68	8.00
6.80	20.40	29.50	68	8.00
6.90	20.70	30.00	68	8.00
7.00	21.00	31.00	68	8.00
7.10	21.30	31.50	72	8.00
7.20	21.60	31.50	72	8.00
7.30	21.90	32.00	72	8.00
7.40	22.20	32.00	72	8.00
7.50	22.50	32.50	72	8.00
7.60	22.80	32.50	72	8.00
7.70	23.10	33.50	72	8.00
7.80	23.40	33.50	72	8.00
7.90	23.70	34.00	72	8.00
8.00	24.00	34.00	72	8.00
8.10	24.30	35.50	79	10.00
8.20	24.60	35.50	79	10.00
8.30	24.90	36.00	79	10.00
8.40	25.20	36.00	79	10.00
8.50	25.50	36.50	79	10.00
8.60	25.80	37.00	79	10.00
8.70	26.10	37.00	79	10.00
8.80	26.40	37.50	79	10.00
8.90	26.70	37.50	79	10.00
9.00	27.00	38.00	79	10.00
9.10	27.30	38.50	85	10.00
9.20	27.60	38.50	85	10.00
9.30	27.90	39.00	85	10.00
9.40	28.20	39.00	85	10.00
9.50	28.50	40.00	85	10.00
9.60	28.80	40.00	85	10.00
9.70	29.10	40.50	85	10.00
9.80	29.40	40.50	85	10.00
9.90	29.70	41.00	85	10.00
10.00	30.00	42.00	85	10.00
10.10	30.30	42.50	93	12.00
10.20	30.60	42.50	93	12.00
10.30	30.90	43.00	93	12.00
10.40	31.20	43.00	93	12.00
10.50	31.50	43.50	93	12.00
10.60	31.80	44.00	93	12.00
10.70	32.10	44.00	93	12.00
10.80	32.40	44.50	93	12.00
10.90	32.70	44.50	93	12.00
11.00	33.00	46.00	93	12.00
11.10	33.30	46.50	97	12.00
11.20	33.60	46.50	97	12.00
11.30	33.90	47.00	97	12.00
11.40	34.20	47.00	97	12.00
11.50	34.50	48.00	97	12.00
11.60	34.80	48.00	97	12.00
11.70	35.10	48.00	97	12.00
11.80	35.40	48.50	97	12.00
11.90	35.70	48.50	97	12.00
12.00	36.00	50.00	97	12.00
12.50	37.80	53.00	100	14.00
12.70	38.10	53.00	100	14.00

Hochleistungsbohrer Phoenix 6 × d — Art. 50940

Foret à grand rendement Phoenix 6 × d
Punta ad alto rendimento Phoenix 6 × d
High performance drill Phoenix 6 × d

P1–3 | M1,2 | K1,2 | N2,3 | S1

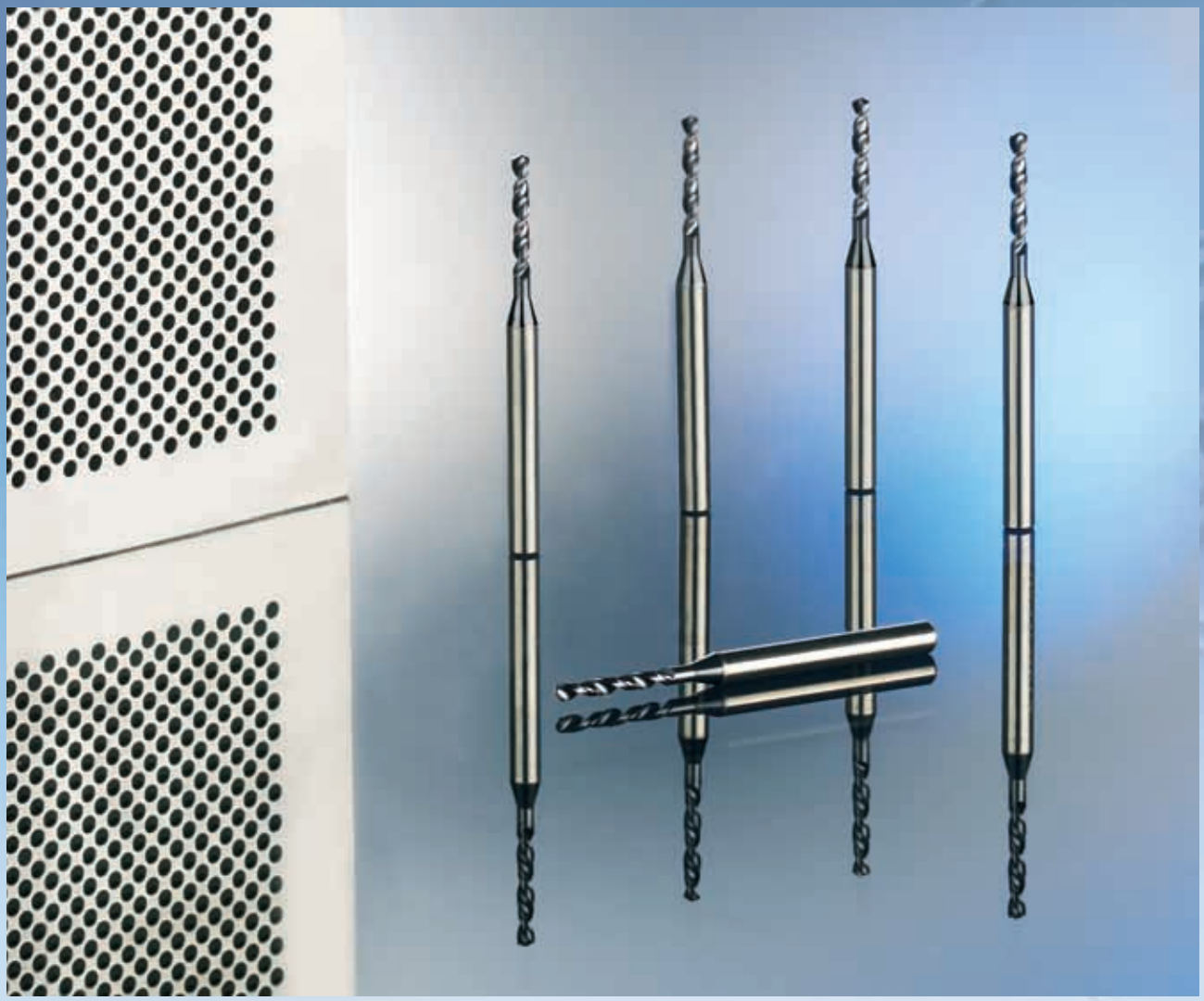


VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | 30° | 6×d | TiAlN

Vc → S./p. 175

d1 mm	l2 mm	l3 mm	l1 mm	d2 mm
1.00	6.00	8.00	38	3.00
1.05	6.30	8.30	38	3.00
1.10	6.60	8.60	38	3.00
1.15	6.90	8.90	38	3.00
1.20	7.20	9.20	38	3.00
1.25	7.50	9.50	38	3.00
1.30	7.80	9.80	38	3.00
1.35	8.10	10.10	38	3.00
1.40	8.40	10.40	38	3.00
1.45	8.70	10.70	38	3.00
1.50	9.00	11.00	38	3.00
1.55	9.30	11.30	38	3.00
1.60	9.60	12.60	38	3.00
1.65	9.90	12.90	38	3.00
1.70	10.20	13.20	38	3.00
1.75	10.50	13.50	38	3.00
1.80	10.80	13.80	38	3.00
1.85	11.10	14.10	38	3.00
1.90	11.40	14.40	38	3.00
1.95	11.70	14.70	38	3.00
2.00	12.00	15.00	50	3.00
2.05	12.30	15.30	50	3.00
2.10	12.60	15.60	50	3.00
2.15	12.90	15.90	50	3.00
2.20	13.20	16.20	50	3.00
2.25	13.50	16.50	50	3.00
2.30	13.80	16.80	50	3.00
2.35	14.10	17.10	50	3.00
2.40	14.40	17.40	50	3.00
2.45	14.70	17.70	50	3.00
2.50	15.00	18.00	50	3.00
2.55	15.30	18.30	50	3.00
2.60	15.60	18.60	50	3.00
2.65	15.90	18.90	50	3.00
2.70	16.20	19.20	50	3.00
2.75	16.50	19.50	50	3.00
2.80	16.80	19.80	50	3.00
2.85	17.10	20.10	50	3.00
2.90	17.40	20.40	50	3.00
2.95	17.70	20.70	50	3.00
3.00	18.00		50	3.00
3.05	18.30	22.30	66	6.00
3.10	18.60	22.60	66	6.00
3.15	18.90	22.90	66	6.00
3.20	19.20	23.20	66	6.00
3.25	19.50	23.50	66	6.00
3.30	19.80	23.80	66	6.00
3.35	20.10	24.10	66	6.00
3.40	20.40	24.40	66	6.00
3.45	20.70	24.70	66	6.00
3.50	21.00	25.00	66	6.00
3.55	21.30	25.30	66	6.00
3.60	21.60	25.60	66	6.00
3.65	21.90	25.90	66	6.00
3.70	22.20	26.20	66	6.00
3.75	22.50	26.50	66	6.00
3.80	22.80	26.80	66	6.00
3.85	23.10	27.10	66	6.00
3.90	23.40	27.40	66	6.00
3.95	23.70	27.70	66	6.00
4.00	24.00	28.00	66	6.00
4.05	24.30	30.20	79	6.00
4.10	24.60	30.50	79	6.00
4.15	24.90	30.80	79	6.00
4.20	25.20	31.00	79	6.00
4.25	25.50	31.50	79	6.00
4.30	25.80	32.00	79	6.00
4.35	26.10	32.50	79	6.00
4.40	26.40	32.50	79	6.00
4.45	26.70	33.00	79	6.00
4.50	27.00	33.00	79	6.00
4.55	27.30	35.50	79	6.00
4.60	27.60	35.50	79	6.00
4.65	27.90	36.00	79	6.00
4.70	28.20	36.00	79	6.00
4.75	28.50	37.00	79	6.00
4.80	28.80	37.00	79	6.00
4.85	29.10	37.50	79	6.00
4.90	29.40	37.50	79	6.00
4.95	29.70	38.00	79	6.00
5.00	30.00	38.00	79	6.00
5.05	30.30	38.50	79	6.00
5.10	30.60	38.50	79	6.00
5.15	30.90	39.00	79	6.00
5.20	31.20	39.00	79	6.00
5.25	31.50	40.00	79	6.00
5.30	31.80	40.00	79	6.00
5.35	32.10	40.50	79	6.00
5.40	32.40	40.50	79	6.00
5.45	32.70	41.00	79	6.00
5.50	33.00	41.00	79	6.00
5.55	33.30	41.50	81	6.00
5.60	33.60	41.50	81	6.00
5.65	33.90	42.00	81	6.00
5.70	34.20	42.00	81	6.00
5.75	34.50	43.00	81	6.00
5.80	34.80	43.00	81	6.00
5.85	35.10	43.50	81	6.00
5.90	35.40	43.50	81	6.00
5.95	35.70	44.00	81	6.00
6.00	36.00		81	6.00
6.10	36.60	45.50	89	8.00
6.20	37.20	46.00	89	8.00
6.30	37.80	47.00	89	8.00
6.40	38.40	47.50	89	8.00
6.50	39.00	48.00	89	8.00
6.60	39.60	48.50	89	8.00
6.70	40.20	49.00	89	8.00
6.80	40.80	50.00	89	8.00
6.90	41.40	50.50	89	8.00
7.00	42.00	52.00	89	8.00
7.10	42.60	52.50	95	8.00
7.20	43.20	53.50	95	8.00
7.30	43.80	54.00	95	8.00
7.40	44.40	54.50	95	8.00
7.50	45.00	55.00	95	8.00
7.60	45.60	55.50	95	8.00
7.70	46.20	56.00	95	8.00
7.80	46.80	57.00	95	8.00
7.90	47.40	57.50	95	8.00
8.00	48.00	58.00	95	8.00
8.10	48.60	59.50	106	10.00
8.20	49.20	60.00	106	10.00
8.30	49.80	61.00	106	10.00
8.40	50.40	61.50	106	10.00
8.50	51.00	62.00	106	10.00
8.60	51.60	62.50	106	10.00
8.70	52.20	63.00	106	10.00
8.80	52.80	64.00	106	10.00
8.90	53.40	64.50	106	10.00
9.00	54.00	65.00	106	10.00
9.10	54.60	65.50	113	10.00
9.20	55.20	66.00	113	10.00
9.30	55.80	67.00	113	10.00
9.40	56.40	67.50	113	10.00
9.50	57.00	68.00	113	10.00
9.60	57.60	68.50	113	10.00
9.70	58.20	69.00	113	10.00
9.80	58.80	70.00	113	10.00
9.90	59.40	70.50	113	10.00
10.00	60.00	72.00	113	10.00
10.10	60.60	72.50	125	12.00
10.20	61.20	73.00	125	12.00
10.30	61.80	74.00	125	12.00
10.40	62.40	74.50	125	12.00
10.50	63.00	75.00	125	12.00
10.60	63.60	75.50	125	12.00
10.70	64.20	76.00	125	12.00
10.80	64.80	77.00	125	12.00
10.90	65.40	77.50	125	12.00
11.00	66.00	79.00	125	12.00
11.10	66.60	79.50	132	12.00

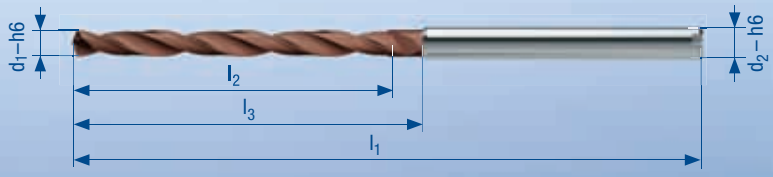
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
11.20	67.20	80.00	132	12.00
11.30	67.80	81.00	132	12.00
11.40	68.40	81.50	132	12.00
11.50	69.00	82.00	132	12.00
11.60	69.60	82.50	132	12.00
11.70	70.20	83.00	132	12.00
11.80	70.80	84.00	132	12.00
11.90	71.40	84.50	132	12.00
12.00	72.00	86.00	132	12.00
12.50	75.00	90.00	140	14.00
12.70	76.20	91.00	140	14.00



Hochleistungsbohrer Phoenix 12×d — Art. 50942

Foret à grand rendement Phoenix 12×d
Punta ad alto rendimento Phoenix 12×d
High performance drill Phoenix 12×d

P1–3 | M1,2 | K1,2 | N2,3 | S1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | AlCrN

Innenkühlung ab ø 2.50 mm
Trou d'huile à partir du ø 2.50 mm
Fori di lubrificazione a partire dal ø 2.50 mm
Internal coolant from ø 2.50 mm

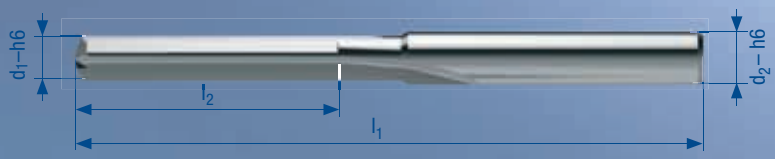
Vc → S./p. 176

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	12.00	14.00	50	3.00
1.10	13.20	15.50	50	3.00
1.20	14.40	16.50	50	3.00
1.30	15.60	17.50	50	3.00
1.40	16.80	19.00	50	3.00
1.50	18.00	21.00	50	3.00
1.60	19.20	22.50	50	3.00
1.70	20.40	23.50	50	3.00
1.80	21.60	24.50	50	3.00
1.90	22.80	26.00	55	3.00
2.00	24.00	27.00	55	3.00
2.10	25.20	28.50	55	3.00
2.20	26.40	29.50	55	3.00
2.30	27.60	30.50	55	3.00
2.40	28.80	32.00	55	3.00
2.50	30.00	33.00	60	3.00
2.60	31.20	34.50	60	3.00
2.70	32.40	35.50	60	3.00
2.80	33.60	36.50	60	3.00
2.90	34.80	38.00	60	3.00
3.00	36.00	40.00	60	3.00
3.10	37.20	41.50	80	6.00
3.20	38.40	42.50	80	6.00
3.30	39.60	43.50	80	6.00
3.40	40.80	45.00	85	6.00
3.50	42.00	47.00	85	6.00
3.60	43.20	48.50	85	6.00
3.70	44.40	49.50	90	6.00
3.80	45.60	50.50	90	6.00
3.90	46.80	52.00	90	6.00
4.00	48.00	53.00	90	6.00
4.10	49.20	55.50	105	6.00
4.20	50.40	56.50	105	6.00
4.30	51.60	57.50	105	6.00
4.40	52.80	59.00	105	6.00
4.50	54.00	60.00	105	6.00
4.60	55.20	63.50	105	6.00
4.70	56.40	64.50	105	6.00
4.80	57.60	65.50	105	6.00
4.90	58.80	67.00	105	6.00
5.00	60.00	68.00	105	6.00
5.10	61.20	69.50	118	6.00
5.20	62.40	70.50	118	6.00
5.30	63.60	71.50	118	6.00
5.40	64.80	73.00	118	6.00
5.50	66.00	74.00	118	6.00
5.60	67.20	75.50	118	6.00
5.70	68.40	76.50	118	6.00
5.80	69.60	77.50	118	6.00
5.90	70.80	79.00	118	6.00
6.00	72.00	80.00	118	6.00
6.10	73.20	82.50	136	8.00
6.20	74.40	83.50	136	8.00
6.30	75.60	84.50	136	8.00
6.40	76.80	86.00	136	8.00
6.50	78.00	87.50	136	8.00
6.60	79.20	88.50	136	8.00
6.70	80.40	89.50	136	8.00
6.80	81.60	90.50	136	8.00
6.90	82.80	92.00	136	8.00
7.00	84.00	94.00	136	8.00
7.10	85.20	95.50	148	8.00
7.20	86.40	96.50	148	8.00
7.30	87.60	97.50	148	8.00
7.40	88.80	99.00	148	8.00
7.50	90.00	100.00	148	8.00
7.60	91.20	101.50	148	8.00
7.70	92.40	102.50	148	8.00
7.80	93.60	103.50	148	8.00
7.90	94.80	105.00	148	8.00
8.00	96.00	106.00	148	8.00
8.10	97.20	108.50	162	10.00
8.20	98.40	109.50	162	10.00
8.30	99.60	110.50	162	10.00
8.40	100.80	112.00	162	10.00
8.50	102.00	113.00	162	10.00
8.60	103.20	114.50	162	10.00
8.70	104.40	115.50	162	10.00
8.80	105.60	116.50	162	10.00
8.90	106.80	118.00	162	10.00
9.00	108.00	119.00	162	10.00
9.10	109.20	120.50	175	10.00
9.20	110.40	121.50	175	10.00
9.30	111.60	122.50	175	10.00
9.40	112.80	124.00	175	10.00
9.50	114.00	125.00	175	10.00
9.60	115.20	126.50	175	10.00
9.70	116.40	127.50	175	10.00
9.80	117.60	128.50	175	10.00
9.90	118.80	130.00	175	10.00
10.00	120.00	132.00	175	10.00
10.10	121.20	133.50	193	12.00
10.20	122.40	134.50	193	12.00
10.30	123.60	135.50	193	12.00
10.40	124.80	137.00	193	12.00
10.50	126.00	138.00	193	12.00
10.60	127.20	139.50	193	12.00
10.70	128.40	140.50	193	12.00
10.80	129.60	141.50	193	12.00
10.90	130.80	143.00	193	12.00
11.00	132.00	145.00	193	12.00
11.10	133.20	146.50	205	12.00
11.20	134.40	147.50	205	12.00
11.30	135.60	148.50	205	12.00
11.40	136.80	150.00	205	12.00
11.50	138.00	151.00	205	12.00
11.60	139.20	152.50	205	12.00
11.70	140.40	153.50	205	12.00
11.80	141.60	154.50	205	12.00
11.90	142.80	156.00	205	12.00
12.00	144.00	158.00	205	12.00
12.50	150.00	164.00	218	14.00
12.70	152.40	166.50	218	14.00

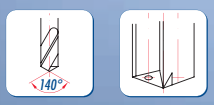
Hochleistungsbohrer Quadro Plus 6×d Art. 52100

Foret à grand rendement Quadro Plus 6×d
Punta ad alto rendimento Quadro Plus 6×d
High performance drill Quadro Plus 6×d

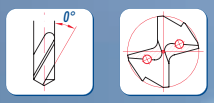
K1,2 | N2,3,5 | 01



VHM MD/SC | SPHINX NORM



Z 2 | H6 – H7



Vc → S./p. 176

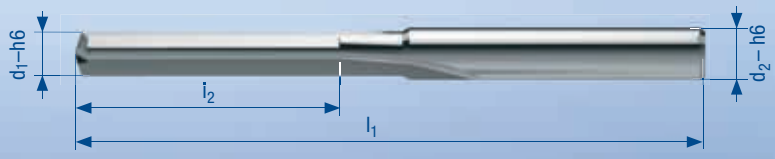
d_1 mm	l_2 mm	l_1 mm	d_2 mm
3.00	18.00	82	6.00
3.30	20.00	82	6.00
3.50	21.00	82	6.00
4.00	24.00	82	6.00
4.20	26.00	88	6.00
4.50	27.00	88	6.00
5.00	30.00	88	6.00
5.50	33.00	94	6.00
6.00	36.00	94	6.00
6.50	39.00	102	8.00
6.80	41.00	102	8.00
7.00	42.00	102	8.00
7.50	45.00	108	8.00
8.00	48.00	108	8.00
8.50	51.00	121	10.00
9.00	54.00	121	10.00
9.50	57.00	127	10.00
10.00	60.00	127	10.00
10.20	62.00	141	12.00
10.50	63.00	141	12.00
11.00	66.00	141	12.00
11.50	69.00	147	12.00
12.00	72.00	147	12.00
12.50	75.00	155	14.00
13.00	78.00	155	14.00
13.50	81.00	162	14.00
14.00	84.00	162	14.00
14.50	87.00	172	16.00
15.00	90.00	172	16.00
15.50	93.00	178	16.00
16.00	96.00	178	16.00
16.50	99.00	192	18.00
17.00	102.00	192	18.00
17.50	105.00	192	18.00
18.00	108.00	192	18.00
18.50	111.00	207	20.00
19.00	114.00	207	20.00
19.50	117.00	207	20.00

d_1 mm	l_2 mm	l_1 mm	d_2 mm
20.00	120.00	207	20.00

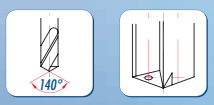
Hochleistungsbohrer Quadro Plus 12×d Art. 52200

Foret à grand rendement Quadro Plus 12×d
Punta ad alto rendimento Quadro Plus 12×d
High performance drill Quadro Plus 12×d

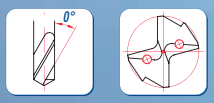
K1,2 N2,3,5 01

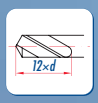


VHM MD/SC SPHINX NORM



Z 2 H6 – H7





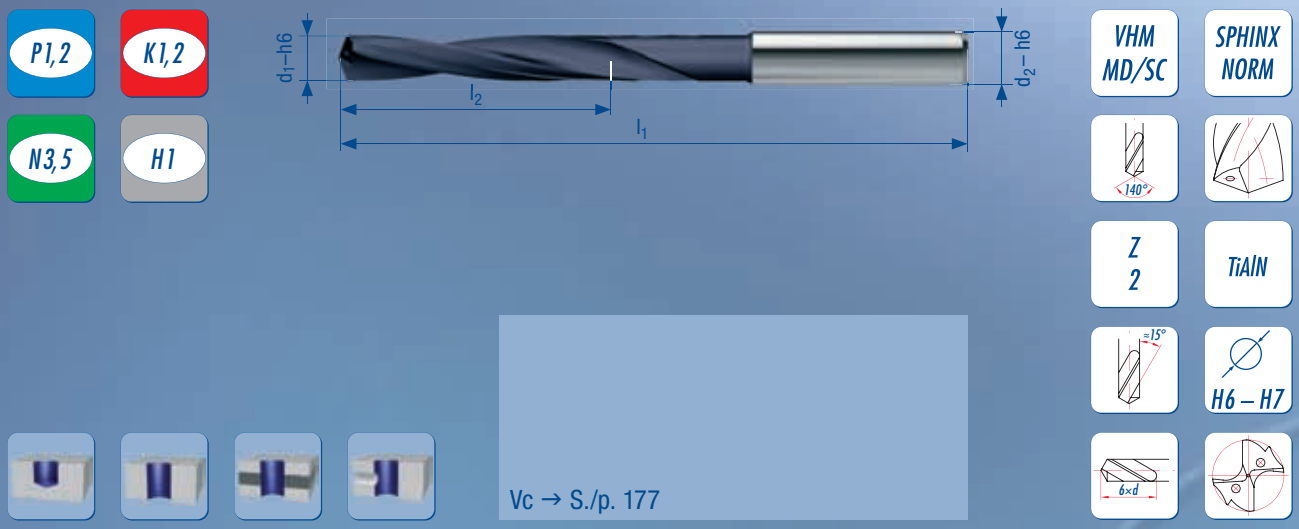
Vc → S./p. 176

d_1 mm	l_2 mm	l_1 mm	d_2 mm
3.00	36.00	106	6.00
3.20	39.00	106	6.00
3.30	40.00	106	6.00
3.50	42.00	106	6.00
4.00	48.00	106	6.00
4.20	51.00	118	6.00
4.50	54.00	118	6.00
4.80	58.00	118	6.00
5.00	60.00	118	6.00
5.50	66.00	130	6.00
6.00	72.00	130	6.00
6.40	78.00	144	8.00
6.50	78.00	144	8.00
6.80	82.00	144	8.00
7.00	84.00	144	8.00
7.50	90.00	156	8.00
7.60	92.00	156	8.00
8.00	96.00	156	8.00
8.50	102.00	175	10.00
9.00	108.00	175	10.00
9.50	114.00	187	10.00
10.00	120.00	187	10.00
10.20	123.00	207	12.00
10.50	126.00	207	12.00
11.00	132.00	207	12.00
11.50	138.00	219	12.00
12.00	144.00	219	12.00
12.50	150.00	233	14.00
12.70	153.00	233	14.00
13.00	156.00	233	14.00
13.50	162.00	245	14.00
14.00	168.00	245	14.00
14.50	174.00	262	16.00
15.00	180.00	262	16.00
15.50	186.00	274	16.00
15.90	191.00	274	16.00
16.00	192.00	274	16.00
16.50	198.00	300	18.00

d_1 mm	l_2 mm	l_1 mm	d_2 mm
17.00	204.00	300	18.00
17.50	210.00	300	18.00
18.00	216.00	300	18.00
18.50	222.00	327	20.00
19.00	228.00	327	20.00
19.50	234.00	327	20.00
20.00	240.00	327	20.00

Hochleistungsbohrer Quadro 15 Plus 6×d Art. 52150

Foret à grand rendement Quadro 15 Plus 6×d
Punta ad alto rendimento Quadro 15 Plus 6×d
High performance drill Quadro 15 Plus 6×d



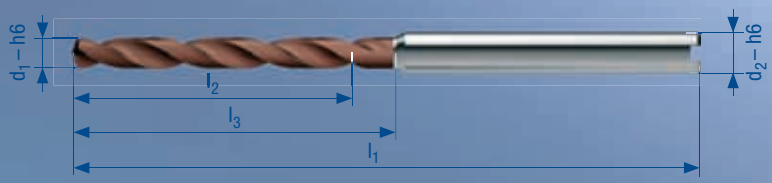
Vc → S./p. 177

d_1 mm	l_2 mm	l_1 mm	d_2 mm
4.00	24.00	75	6.00
4.20	25.50	75	6.00
4.50	27.00	75	6.00
5.00	30.00	87	6.00
5.50	33.00	87	6.00
6.00	36.00	87	6.00
6.50	39.00	100	8.00
6.80	41.00	100	8.00
7.00	42.00	100	8.00
7.50	45.00	100	8.00
8.00	48.00	100	8.00
8.50	51.00	118	10.00
9.00	54.00	118	10.00
9.50	57.00	118	10.00
10.00	60.00	118	10.00
10.20	62.00	135	12.00
10.50	63.00	135	12.00
11.00	66.00	135	12.00
11.50	69.00	135	12.00
12.00	72.00	135	12.00
12.50	75.00	147	14.00
13.00	78.00	147	14.00
13.50	81.00	147	14.00
14.00	84.00	147	14.00
14.50	87.00	164	16.00
15.00	90.00	164	16.00
15.50	93.00	164	16.00
16.00	96.00	164	16.00
16.50	99.00	178	18.00
17.00	102.00	178	18.00
17.50	105.00	178	18.00
18.00	108.00	178	18.00
18.50	111.00	195	20.00
19.00	114.00	195	20.00
19.50	117.00	195	20.00
20.00	120.00	195	20.00

Hochleistungsbohrer Power-Phoenix 9×d Art. 50909

Foret à grand rendement Power-Phoenix 9×d
Punta ad alto rendimento Power-Phoenix 9×d
High performance drill Power-Phoenix 9×d

P1–3 | M1,2 | K1,2 | N2,3,5 | S1 | H1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 9×d | AlCrN

Vc → S./p. 177

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	9.00	11.00	51	3.00
1.10	9.90	12.00	51	3.00
1.20	10.80	13.00	51	3.00
1.30	11.70	14.00	51	3.00
1.40	12.60	15.00	51	3.00
1.50	13.50	16.50	51	3.00
1.60	14.40	17.50	51	3.00
1.70	15.30	18.50	51	3.00
1.80	16.20	19.00	51	3.00
1.90	17.10	20.00	51	3.00
2.00	18.00	21.00	51	3.00
2.10	18.90	22.00	61	3.00
2.20	19.80	23.00	61	3.00
2.30	20.70	24.00	61	3.00
2.40	21.60	24.50	61	3.00
2.50	22.50	25.50	61	3.00
2.60	23.40	26.50	61	3.00
2.70	24.30	27.50	61	3.00
2.80	25.20	28.00	61	3.00
2.90	26.10	29.00	61	3.00
3.00	27.00	31.00	61	3.00
3.10	27.90	32.00	79	6.00
3.20	28.80	33.00	79	6.00
3.30	29.70	34.00	79	6.00
3.40	30.60	35.00	79	6.00
3.50	31.50	36.50	79	6.00
3.60	32.40	37.50	79	6.00
3.70	33.30	38.50	79	6.00
3.80	34.20	39.00	79	6.00
3.90	35.10	40.00	79	6.00
4.00	36.00	41.00	79	6.00
4.10	36.90	43.00	91	6.00
4.20	37.80	44.00	91	6.00
4.30	38.70	45.00	91	6.00
4.40	39.60	45.50	91	6.00
4.50	40.50	46.50	91	6.00
4.60	41.40	49.50	91	6.00
4.70	42.30	50.50	91	6.00
4.80	43.20	51.00	91	6.00
4.90	44.10	52.00	91	6.00
5.00	45.00	53.00	91	6.00
5.10	45.90	54.00	100	6.00
5.20	46.80	55.00	100	6.00
5.30	47.70	56.00	100	6.00
5.40	48.60	57.00	100	6.00
5.50	49.50	57.50	100	6.00
5.60	50.40	58.50	100	6.00
5.70	51.30	59.50	100	6.00
5.80	52.20	60.00	100	6.00
5.90	53.10	61.00	100	6.00
6.00	54.00	62.00	100	6.00
6.10	54.90	64.00	111	8.00
6.20	55.80	65.00	111	8.00
6.30	56.70	66.00	111	8.00
6.40	57.60	66.50	111	8.00
6.50	58.50	67.50	111	8.00
6.60	59.40	68.50	111	8.00
6.70	60.30	69.50	111	8.00
6.80	61.20	70.00	111	8.00
6.90	62.10	71.00	111	8.00
7.00	63.00	73.00	111	8.00
7.10	63.90	74.00	120	8.00
7.20	64.80	75.00	120	8.00
7.30	65.70	76.00	120	8.00
7.40	66.60	76.50	120	8.00
7.50	67.50	77.50	120	8.00
7.60	68.40	78.50	120	8.00
7.70	69.30	79.50	120	8.00
7.80	70.20	80.00	120	8.00
7.90	82.00	81.00	120	8.00
8.00	72.00	82.00	120	8.00
8.10	72.90	84.00	134	10.00
8.20	73.80	85.00	134	10.00
8.30	74.70	86.00	134	10.00
8.40	75.60	86.50	134	10.00
8.50	76.50	87.50	134	10.00
8.60	77.40	88.50	134	10.00
8.70	78.30	89.50	134	10.00
8.80	79.20	90.00	134	10.00
8.90	80.10	91.00	134	10.00
9.00	81.00	92.00	134	10.00
9.10	81.90	93.00	144	10.00
9.20	82.80	94.00	144	10.00
9.30	83.70	95.00	144	10.00
9.40	84.60	95.50	144	10.00
9.50	85.50	96.50	144	10.00
9.60	86.40	97.50	144	10.00
9.70	87.30	98.50	144	10.00
9.80	88.20	99.00	144	10.00
9.90	89.10	100.00	144	10.00
10.00	90.00	102.00	144	10.00
10.10	90.90	103.00	159	12.00
10.20	91.80	104.00	159	12.00
10.30	92.70	105.00	159	12.00
10.40	93.60	105.50	159	12.00
10.50	94.50	106.50	159	12.00
10.60	95.40	107.50	159	12.00
10.70	96.30	108.50	159	12.00
10.80	97.20	109.00	159	12.00
10.90	98.10	110.00	159	12.00
11.00	99.00	112.00	159	12.00
11.10	99.90	113.00	169	12.00
11.20	100.80	114.00	169	12.00
11.30	101.70	115.00	169	12.00
11.40	102.60	115.50	169	12.00
11.50	103.50	116.50	169	12.00
11.60	104.40	117.50	169	12.00
11.70	105.30	118.50	169	12.00
11.80	106.20	119.00	169	12.00
11.90	107.10	120.00	169	12.00
12.00	108.00	122.00	169	12.00
12.50	112.50	126.50	179	14.00
12.70	114.30	128.50	179	14.00

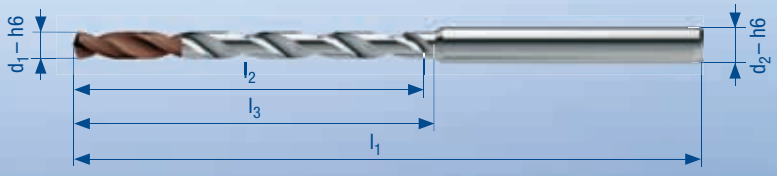
Hochleistungsbohrer Power-Phoenix 12×d Art. 50912

Foret à grand rendement Power-Phoenix 12×d

Punta ad alto rendimento Power-Phoenix 12×d

High performance drill Power-Phoenix 12×d

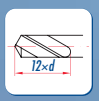
P1,2 K1,2



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrN

Ab ø 2.00 mm mit 4 Führungsfasen
A partir de ø 2.00 mm avec 4 listel
A partire da ø 2.00 mm con 4 pattini di guida
From ø 2.00 mm with 4 guide margins

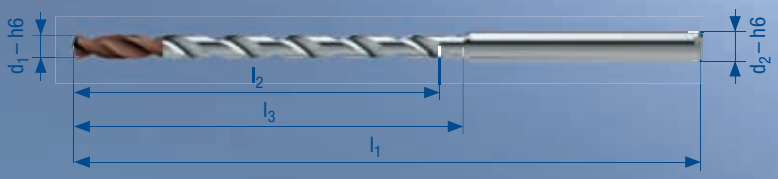
Vc → S./p. 178

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	12.00	14.00	50	3.00
1.10	13.20	15.50	50	3.00
1.20	14.40	16.50	50	3.00
1.30	15.60	17.50	50	3.00
1.40	16.80	19.00	50	3.00
1.50	18.00	21.00	50	3.00
1.60	19.20	22.50	50	3.00
1.70	20.40	23.50	50	3.00
1.80	21.60	24.50	50	3.00
1.90	22.80	26.00	55	3.00
2.00	24.00	27.00	55	3.00
2.10	25.20	28.50	55	3.00
2.20	26.40	29.50	55	3.00
2.30	27.60	30.50	55	3.00
2.40	28.80	32.00	55	3.00
2.50	30.00	33.00	60	3.00
2.60	31.20	34.50	60	3.00
2.70	32.40	35.50	60	3.00
2.80	33.60	36.50	60	3.00
2.90	34.80	38.00	60	3.00
3.00	36.00	40.00	60	3.00
3.10	37.20	41.50	80	6.00
3.20	38.40	42.50	80	6.00
3.30	39.60	43.50	80	6.00
3.40	40.80	45.00	85	6.00
3.50	42.00	47.00	85	6.00
3.60	43.20	48.50	85	6.00
3.70	44.40	49.50	90	6.00
3.80	45.60	50.50	90	6.00
3.90	46.80	52.00	90	6.00
4.00	48.00	53.00	90	6.00
4.10	49.20	55.50	105	6.00
4.20	50.40	56.50	105	6.00
4.30	51.60	57.50	105	6.00
4.40	52.80	59.00	105	6.00
4.50	54.00	60.00	105	6.00
4.60	55.20	63.50	105	6.00
4.70	56.40	64.50	105	6.00
4.80	57.60	65.50	105	6.00
4.90	58.80	67.00	105	6.00
5.00	60.00	68.00	105	6.00
5.10	61.20	69.50	118	6.00
5.20	62.40	70.50	118	6.00
5.30	63.60	71.50	118	6.00
5.40	64.80	73.00	118	6.00
5.50	66.00	74.00	118	6.00
5.60	67.20	75.50	118	6.00
5.70	68.40	76.50	118	6.00
5.80	69.60	77.50	118	6.00
5.90	70.80	79.00	118	6.00
6.00	72.00	80.00	118	6.00
6.10	73.20	82.50	136	8.00
6.20	74.40	83.50	136	8.00
6.30	75.60	84.50	136	8.00
6.40	76.80	86.00	136	8.00
6.50	78.00	87.50	136	8.00
6.60	79.20	88.50	136	8.00
6.70	80.40	89.50	136	8.00
6.80	81.60	90.50	136	8.00
6.90	82.80	92.00	136	8.00
7.00	84.00	94.00	136	8.00
7.10	85.20	95.50	148	8.00
7.20	86.40	96.50	148	8.00
7.30	87.60	97.50	148	8.00
7.40	88.80	99.00	148	8.00
7.50	90.00	100.00	148	8.00
7.60	91.20	101.50	148	8.00
7.70	92.40	102.50	148	8.00
7.80	93.60	103.50	148	8.00
7.90	94.80	105.00	148	8.00
8.00	96.00	106.00	148	8.00
8.10	97.20	108.50	162	10.00
8.20	98.40	109.50	162	10.00
8.30	99.60	110.50	162	10.00
8.40	100.80	112.00	162	10.00
8.50	102.00	113.00	162	10.00
8.60	103.20	114.50	162	10.00
8.70	104.40	115.50	162	10.00
8.80	105.60	116.50	162	10.00
8.90	106.80	118.00	162	10.00
9.00	108.00	119.00	162	10.00
9.10	109.20	120.50	175	10.00
9.20	110.40	121.50	175	10.00
9.30	111.60	122.50	175	10.00
9.40	112.80	124.00	175	10.00
9.50	114.00	125.00	175	10.00
9.60	115.20	126.50	175	10.00
9.70	116.40	127.50	175	10.00
9.80	117.60	128.50	175	10.00
9.90	118.80	130.00	175	10.00
10.00	120.00	132.00	175	10.00
10.10	121.20	133.50	193	12.00
10.20	122.40	134.50	193	12.00
10.30	123.60	135.50	193	12.00
10.40	124.80	137.00	193	12.00
10.50	126.00	138.00	193	12.00
10.60	127.20	139.50	193	12.00
10.70	128.40	140.50	193	12.00
10.80	129.60	141.50	193	12.00
10.90	130.80	143.00	193	12.00
11.00	132.00	145.00	193	12.00
11.10	133.20	146.50	205	12.00
11.20	134.40	147.50	205	12.00
11.30	135.60	148.50	205	12.00
11.40	136.80	150.00	205	12.00
11.50	138.00	151.00	205	12.00
11.60	139.20	152.50	205	12.00
11.70	140.40	153.50	205	12.00
11.80	141.60	154.50	205	12.00
11.90	142.80	156.00	205	12.00
12.00	144.00	158.00	205	12.00
12.50	150.00	164.00	218	14.00
12.70	152.40	166.50	218	14.00

Hochleistungsbohrer Power-Phoenix 16×d Art. 50916

Foret à grand rendement Power-Phoenix 16×d
Punta ad alto rendimento Power-Phoenix 16×d
High performance drill Power-Phoenix 16×d

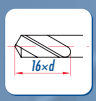
P1,2 K1,2



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrN

Ab ø 2.00 mm mit 4 Führungsfasen
A partir de ø 2.00 mm avec 4 listel
A partire da ø 2.00 mm con 4 pattini di guida
From ø 2.00 mm with 4 guide margins

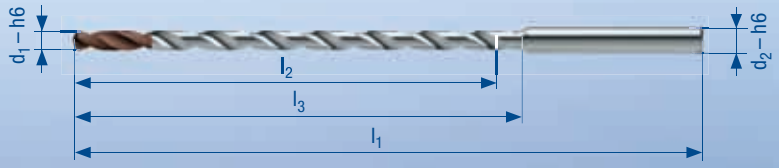
Vc → S./p. 178

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	16.00	18.00	65	3.00
1.10	17.60	19.50	65	3.00
1.20	19.20	21.00	65	3.00
1.30	20.80	23.00	65	3.00
1.40	22.40	24.50	65	3.00
1.50	24.00	27.00	65	3.00
1.60	25.60	28.50	65	3.00
1.70	27.20	30.00	65	3.00
1.80	28.80	32.00	65	3.00
1.90	30.40	33.50	65	3.00
2.00	32.00	35.00	65	3.00
2.10	33.60	36.50	82	3.00
2.20	35.20	38.00	82	3.00
2.30	36.80	40.00	82	3.00
2.40	38.40	41.50	82	3.00
2.50	40.00	43.00	82	3.00
2.60	41.60	44.50	82	3.00
2.70	43.20	46.00	82	3.00
2.80	44.80	48.00	82	3.00
2.90	46.40	49.50	82	3.00
3.00	48.00	52.00	82	3.00
3.10	49.60	53.50	107	6.00
3.20	51.20	55.00	107	6.00
3.30	52.80	57.00	107	6.00
3.40	54.40	58.50	107	6.00
3.50	56.00	61.00	107	6.00
3.60	57.60	62.50	107	6.00
3.70	59.20	64.00	107	6.00
3.80	60.80	66.00	107	6.00
3.90	62.40	67.50	107	6.00
4.00	64.00	69.00	107	6.00
4.10	65.60	71.50	126	6.00
4.20	67.20	73.00	126	6.00
4.30	68.80	75.00	126	6.00
4.40	70.40	76.50	126	6.00
4.50	72.00	78.00	126	6.00
4.60	73.60	81.50	126	6.00
4.70	75.20	83.00	126	6.00
4.80	76.80	85.00	126	6.00
4.90	78.40	86.50	126	6.00
5.00	80.00	88.00	126	6.00
5.10	81.60	89.50	142	6.00
5.20	83.20	91.00	142	6.00
5.30	84.80	93.00	142	6.00
5.40	86.40	94.50	142	6.00
5.50	88.00	96.00	142	6.00
5.60	89.60	97.50	142	6.00
5.70	91.20	99.00	142	6.00
5.80	92.80	101.00	142	6.00
5.90	94.40	102.50	142	6.00
6.00	96.00	104.00	142	6.00
6.10	97.60	106.50	160	8.00
6.20	99.20	108.00	160	8.00
6.30	100.80	110.00	160	8.00
6.40	102.40	111.50	160	8.00
6.50	104.00	113.00	160	8.00
6.60	105.60	114.50	160	8.00
6.70	107.20	116.00	160	8.00
6.80	108.80	118.00	160	8.00
6.90	110.40	119.50	160	8.00
7.00	112.00	122.00	160	8.00
7.10	113.60	123.50	176	8.00
7.20	115.20	125.00	176	8.00
7.30	116.80	127.00	176	8.00
7.40	118.40	128.50	176	8.00
7.50	120.00	130.00	176	8.00
7.60	121.60	131.50	176	8.00
7.70	123.20	133.00	176	8.00
7.80	124.80	135.00	176	8.00
7.90	126.40	136.50	176	8.00
8.00	128.00	138.00	176	8.00
8.10	129.60	140.50	197	10.00
8.20	131.20	142.00	197	10.00
8.30	132.80	144.00	197	10.00
8.40	134.40	145.50	197	10.00
8.50	136.00	147.00	197	10.00
8.60	137.60	148.50	197	10.00
8.70	139.20	150.00	197	10.00
8.80	140.80	152.00	197	10.00
8.90	142.40	153.50	197	10.00
9.00	144.00	155.00	197	10.00
9.10	145.60	156.50	214	10.00
9.20	147.20	158.00	214	10.00
9.30	148.80	160.00	214	10.00
9.40	150.40	161.50	214	10.00
9.50	152.00	163.00	214	10.00
9.60	153.60	164.50	214	10.00
9.70	155.20	166.00	214	10.00
9.80	156.80	168.00	214	10.00
9.90	158.40	169.50	214	10.00
10.00	160.00	172.00	214	10.00
10.10	161.60	173.50	236	12.00
10.20	163.20	175.00	236	12.00
10.30	164.80	177.00	236	12.00
10.40	166.40	178.50	236	12.00
10.50	168.00	180.00	236	12.00
10.60	169.60	181.50	236	12.00
10.70	171.20	183.00	236	12.00
10.80	172.80	185.00	236	12.00
10.90	174.40	186.50	236	12.00
11.00	176.00	189.00	236	12.00
11.10	177.60	190.50	253	12.00
11.20	179.20	192.00	253	12.00
11.30	180.80	194.00	253	12.00
11.40	182.40	195.50	253	12.00
11.50	184.00	197.00	253	12.00
11.60	185.60	198.50	253	12.00
11.70	187.20	200.00	253	12.00
11.80	188.80	202.00	253	12.00
11.90	190.40	203.50	253	12.00
12.00	192.00	206.00	253	12.00
12.50	200.00	214.00	270	14.00
12.70	203.20	217.00	270	14.00

Hochleistungsbohrer Power-Phoenix 20×d Art. 50920

Foret à grand rendement Power-Phoenix 20×d
Punta ad alto rendimento Power-Phoenix 20×d
High performance drill Power-Phoenix 20×d

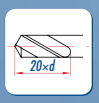
P1,2 K1,2



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrN

Anwendung
Application
Applicazione
Application
} S./p. 199

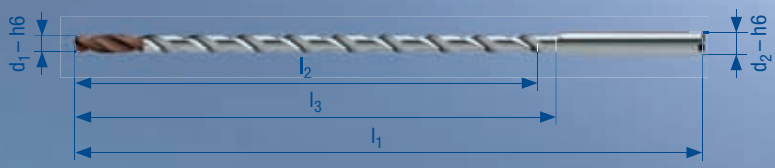
Vc → S./p. 178

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	60.00	69.00	108	6.00
3.30	66.00	75.00	113	6.00
4.00	80.00	94.00	132	6.00
4.20	84.00	98.00	136	6.00
5.00	100.00	107.00	145	6.00
6.00	120.00	138.00	176	6.00
6.80	136.00	156.00	196	8.00
7.00	140.00	161.00	201	8.00
8.00	160.00	182.00	222	8.00
8.50	170.00	195.00	240	10.00
9.00	180.00	207.00	252	10.00
10.00	200.00	230.00	275	10.00

Hochleistungsbohrer Power-Phoenix 25×d Art. 50925

Foret à grand rendement Power-Phoenix 25×d
Punta ad alto rendimento Power-Phoenix 25×d
High performance drill Power-Phoenix 25×d

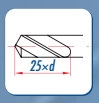
P1,2 K1,2



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrN

Anwendung
Application
Applicazione
Application
} S./p. 199

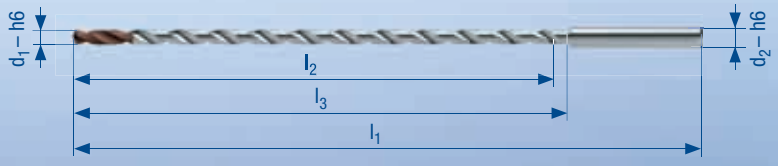
Vc → S./p. 178

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	75.00	84.00	123	6.00
3.30	83.00	92.00	128	6.00
4.00	100.00	114.00	152	6.00
4.20	105.00	119.00	157	6.00
5.00	125.00	132.00	170	6.00
6.00	150.00	168.00	206	6.00
6.80	170.00	190.00	230	8.00
7.00	175.00	196.00	236	8.00
8.00	200.00	222.00	262	8.00
8.50	213.00	238.00	283	10.00
9.00	225.00	252.00	297	10.00
10.00	250.00	280.00	325	10.00

Hochleistungsbohrer Power-Phoenix 30 × d Art. 50930

Foret à grand rendement Power-Phoenix 30 × d
Punta ad alto rendimento Power-Phoenix 30 × d
High performance drill Power-Phoenix 30 × d

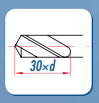
P1,2 K1,2



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrN

Anwendung
Application
Applicazione
Application
S./p. 199

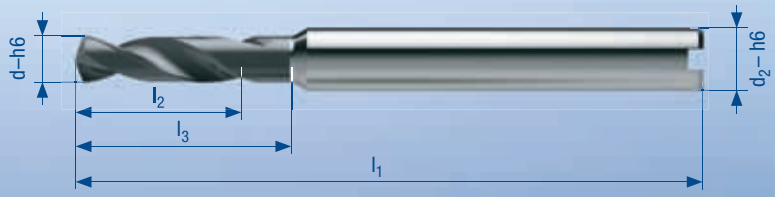
Vc → S./p. 178

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	90.00	99.00	138	6.00
3.30	99.00	108.00	146	6.00
4.00	120.00	134.00	172	6.00
4.20	126.00	140.00	178	6.00
5.00	150.00	167.00	205	6.00
6.00	180.00	198.00	236	6.00
6.80	204.00	224.00	264	8.00
7.00	210.00	231.00	271	8.00
8.00	240.00	262.00	302	8.00
8.50	255.00	280.00	325	10.00
9.00	270.00	297.00	342	10.00
10.00	285.00	300.00	345	10.00

Hochleistungsbohrer Phoenix-TC2 3×d Art. 52903

Foret à grand rendement Phoenix-TC2 3×d
Punta ad alto rendimento Phoenix-TC2 3×d
High performance drill Phoenix-TC2 3×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 3×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

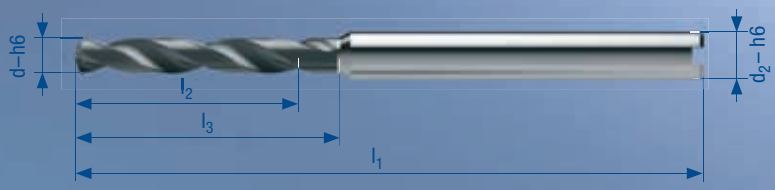
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	3.00	5.00	38	3.00
1.05	3.15	5.25	38	3.00
1.10	3.30	5.50	38	3.00
1.15	3.45	5.50	38	3.00
1.20	3.60	5.50	38	3.00
1.25	3.75	6.00	38	3.00
1.30	3.90	6.00	38	3.00
1.35	4.05	6.00	38	3.00
1.40	4.20	6.50	38	3.00
1.45	4.35	6.50	38	3.00
1.50	4.50	6.50	38	3.00
1.55	4.65	7.50	38	3.00
1.60	4.80	7.50	38	3.00
1.65	4.95	8.00	38	3.00
1.70	5.10	8.00	38	3.00
1.75	5.25	8.00	38	3.00
1.80	5.40	8.50	38	3.00
1.85	5.55	8.50	38	3.00
1.90	5.70	8.50	38	3.00
1.95	5.85	9.00	38	3.00
2.00	6.00	9.00	38	3.00
2.05	6.15	9.00	38	3.00
2.10	6.30	9.50	38	3.00
2.15	6.45	9.50	38	3.00
2.20	6.60	9.50	38	3.00
2.25	6.75	10.00	38	3.00
2.30	6.90	10.00	38	3.00
2.35	7.05	10.00	38	3.00
2.40	7.20	10.00	38	3.00
2.45	7.35	10.00	38	3.00
2.50	7.50	10.50	50	3.00
2.55	7.65	11.00	50	3.00
2.60	7.80	11.00	50	3.00
2.65	7.95	11.00	50	3.00
2.70	8.10	11.50	50	3.00
2.75	8.25	11.50	50	3.00
2.80	8.40	11.50	50	3.00
2.85	8.55	12.00	50	3.00
2.90	8.70	12.00	50	3.00
2.95	8.85	12.00	50	3.00
3.00	9.00	12.50	50	3.00
3.05	9.15	12.50	55	6.00
3.10	9.30	13.50	55	6.00
3.15	9.45	13.50	55	6.00
3.20	9.60	13.50	55	6.00
3.25	9.75	13.50	55	6.00
3.30	9.90	13.50	55	6.00
3.35	10.05	14.00	55	6.00
3.40	10.20	14.00	55	6.00
3.45	10.35	14.00	55	6.00
3.50	10.50	14.50	55	6.00
3.55	10.65	14.50	55	6.00
3.60	10.80	15.00	55	6.00
3.65	10.95	15.00	55	6.00
3.70	11.10	15.00	55	6.00
3.75	11.25	15.00	55	6.00
3.80	11.40	15.50	55	6.00
3.85	11.55	15.50	55	6.00
3.90	11.70	15.50	55	6.00
3.95	11.85	15.50	55	6.00
4.00	12.00	15.50	55	6.00
4.05	12.15	16.50	60	6.00
4.10	12.30	18.50	60	6.00
4.15	12.45	18.50	60	6.00
4.20	12.60	18.50	60	6.00
4.25	12.75	18.50	60	6.00
4.30	12.90	19.00	60	6.00
4.35	13.05	19.00	60	6.00
4.40	13.20	19.00	60	6.00
4.45	13.35	20.50	60	6.00
4.50	13.50	20.50	60	6.00
4.55	13.65	20.50	60	6.00
4.60	13.80	22.00	60	6.00
4.65	13.95	22.00	60	6.00
4.70	14.10	22.00	60	6.00
4.75	14.25	22.00	60	6.00
4.80	14.40	22.50	60	6.00
4.85	14.55	22.50	60	6.00
4.90	14.70	22.50	60	6.00
4.95	14.85	23.00	60	6.00
5.00	15.00	23.00	60	6.00
5.05	15.15	23.00	64	6.00
5.10	15.30	23.50	64	6.00
5.15	15.45	23.50	64	6.00
5.20	15.60	23.50	64	6.00
5.25	15.75	23.50	64	6.00
5.30	15.90	24.00	64	6.00
5.35	16.05	24.00	64	6.00
5.40	16.20	24.00	64	6.00
5.45	16.35	24.00	64	6.00
5.50	16.50	24.50	64	6.00
5.55	16.65	24.50	64	6.00
5.60	16.80	24.50	64	6.00
5.65	16.95	24.50	64	6.00
5.70	17.10	25.50	64	6.00
5.75	17.25	25.50	64	6.00
5.80	17.40	25.50	64	6.00
5.85	17.55	25.50	64	6.00
5.90	17.70	26.00	64	6.00
5.95	17.85	26.00	64	6.00
6.00	18.00	27.00	64	6.00
6.10	18.30	27.50	68	8.00
6.20	18.60	27.50	68	8.00
6.30	18.90	28.00	68	8.00
6.40	19.20	28.00	68	8.00
6.50	19.50	28.50	68	8.00
6.60	19.80	29.00	68	8.00
6.70	20.10	29.50	68	8.00
6.80	20.40	29.50	68	8.00
6.90	20.70	30.00	68	8.00
7.00	21.00	31.00	68	8.00
7.10	21.30	31.50	72	8.00
7.20	21.60	31.50	72	8.00
7.30	21.90	32.00	72	8.00
7.40	22.20	32.00	72	8.00
7.50	22.50	32.50	72	8.00
7.60	22.80	32.50	72	8.00
7.70	23.10	33.50	72	8.00
7.80	23.40	33.50	72	8.00
7.90	23.70	34.00	72	8.00
8.00	24.00	34.00	72	8.00
8.50	25.50	36.50	79	10.00
9.00	27.00	38.00	79	10.00
9.50	28.50	40.00	85	10.00
10.00	30.00	42.00	85	10.00

Hochleistungsbohrer Phoenix-TC2 6×d Art. 52906

Foret à grand rendement Phoenix-TC2 6×d
Punta ad alto rendimento Phoenix-TC2 6×d
High performance drill Phoenix-TC2 6×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 6×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

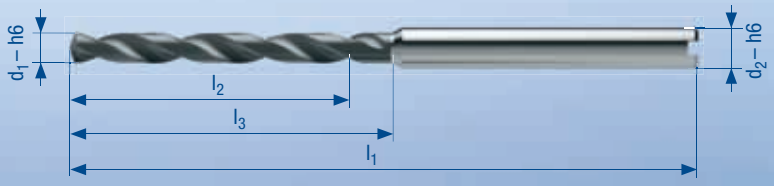
Vc → S./p. 179

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	6.00	8.00	38	3.00
1.05	6.30	8.30	38	3.00
1.10	6.60	8.60	38	3.00
1.15	6.90	8.90	38	3.00
1.20	7.20	9.20	38	3.00
1.25	7.50	9.50	38	3.00
1.30	7.80	9.80	38	3.00
1.35	8.10	10.10	38	3.00
1.40	8.40	10.40	38	3.00
1.45	8.70	10.70	38	3.00
1.50	9.00	11.00	38	3.00
1.55	9.30	11.30	38	3.00
1.60	9.60	12.60	38	3.00
1.65	9.90	12.90	38	3.00
1.70	10.20	13.20	38	3.00
1.75	10.50	13.50	38	3.00
1.80	10.80	13.80	38	3.00
1.85	11.10	14.10	38	3.00
1.90	11.40	14.40	38	3.00
1.95	11.70	14.70	38	3.00
2.00	12.00	15.00	50	3.00
2.05	12.30	15.30	50	3.00
2.10	12.60	15.60	50	3.00
2.15	12.90	15.90	50	3.00
2.20	13.20	16.20	50	3.00
2.25	13.50	16.50	50	3.00
2.30	13.80	16.80	50	3.00
2.35	14.10	17.10	50	3.00
2.40	14.40	17.40	50	3.00
2.45	14.70	17.70	50	3.00
2.50	15.00	18.00	50	3.00
2.55	15.30	18.30	50	3.00
2.60	15.60	18.60	50	3.00
2.65	15.90	18.90	50	3.00
2.70	16.20	19.20	50	3.00
2.75	16.50	19.50	50	3.00
2.80	16.80	19.80	50	3.00
2.85	17.10	20.10	50	3.00
2.90	17.40	20.40	50	3.00
2.95	17.70	20.70	50	3.00
3.00	18.00	21.00	50	3.00
3.05	18.30	22.30	66	6.00
3.10	18.60	22.60	66	6.00
3.15	18.90	22.90	66	6.00
3.20	19.20	23.20	66	6.00
3.25	19.50	23.50	66	6.00
3.30	19.80	23.80	66	6.00
3.35	20.10	24.10	66	6.00
3.40	20.40	24.40	66	6.00
3.45	20.70	24.70	66	6.00
3.50	21.00	25.00	66	6.00
3.55	21.30	25.30	66	6.00
3.60	21.60	25.60	66	6.00
3.65	21.90	25.90	66	6.00
3.70	22.20	26.20	66	6.00
3.75	22.50	26.50	66	6.00
3.80	22.80	26.80	66	6.00
3.85	23.10	27.10	66	6.00
3.90	23.40	27.40	66	6.00
3.95	23.70	27.70	66	6.00
4.00	24.00	28.00	66	6.00
4.05	24.30	30.20	79	6.00
4.10	24.60	30.50	79	6.00
4.15	24.90	30.80	79	6.00
4.20	25.20	31.00	79	6.00
4.25	25.50	31.50	79	6.00
4.30	25.80	32.00	79	6.00
4.35	26.10	32.50	79	6.00
4.40	26.40	32.50	79	6.00
4.45	26.70	33.00	79	6.00
4.50	27.00	33.00	79	6.00
4.55	27.30	35.50	79	6.00
4.60	27.60	35.50	79	6.00
4.65	27.90	36.00	79	6.00
4.70	28.20	36.00	79	6.00
4.75	28.50	37.00	79	6.00
4.80	28.80	37.00	79	6.00
4.85	29.10	37.50	79	6.00
4.90	29.40	37.50	79	6.00
4.95	29.70	38.00	79	6.00
5.00	30.00	38.00	79	6.00
5.05	30.30	38.50	79	6.00
5.10	30.60	38.50	79	6.00
5.15	30.90	39.00	79	6.00
5.20	31.20	39.00	79	6.00
5.25	31.50	40.00	79	6.00
5.30	31.80	40.00	79	6.00
5.35	32.10	40.50	79	6.00
5.40	32.40	40.50	79	6.00
5.45	32.70	41.00	79	6.00
5.50	33.00	41.00	79	6.00
5.55	33.30	41.50	81	6.00
5.60	33.60	41.50	81	6.00
5.65	33.90	42.00	81	6.00
5.70	34.20	42.00	81	6.00
5.75	34.50	43.00	81	6.00
5.80	34.80	43.00	81	6.00
5.85	35.10	43.50	81	6.00
5.90	35.40	43.50	81	6.00
5.95	35.70	44.00	81	6.00
6.00	36.00	44.00	81	6.00
6.10	36.60	45.50	89	8.00
6.20	37.20	46.00	89	8.00
6.30	37.80	47.00	89	8.00
6.40	38.40	47.50	89	8.00
6.50	39.00	48.00	89	8.00
6.60	39.60	48.50	89	8.00
6.70	40.20	49.00	89	8.00
6.80	40.80	50.00	89	8.00
6.90	41.40	50.50	89	8.00
7.00	42.00	52.00	89	8.00
7.10	42.60	52.50	95	8.00
7.20	43.20	53.50	95	8.00
7.30	43.80	54.00	95	8.00
7.40	44.40	54.50	95	8.00
7.50	45.00	55.00	95	8.00
7.60	45.60	55.50	95	8.00
7.70	46.20	56.00	95	8.00
7.80	46.80	57.00	95	8.00
7.90	47.40	57.50	95	8.00
8.00	48.00	58.00	95	8.00
8.50	51.00	62.00	106	10.00
9.00	54.00	65.00	106	10.00
9.50	57.00	68.00	113	10.00
10.00	60.00	72.00	113	10.00

Hochleistungsbohrer Phoenix-TC2 9×d Art. 52909

Foret à grand rendement Phoenix-TC2 9×d
Punta ad alto rendimento Phoenix-TC2 9×d
High performance drill Phoenix-TC2 9×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | 30° | 9×d | AlTiCrN+S

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

Vc → S./p. 179

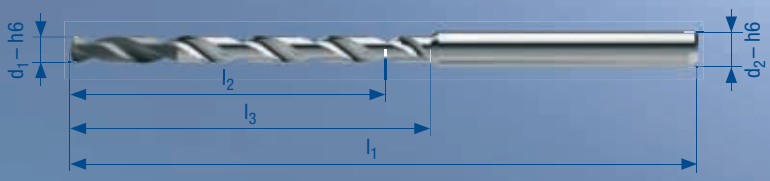
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	9.00	11.00	51	3.00
1.10	9.90	12.00	51	3.00
1.20	10.80	13.00	51	3.00
1.30	11.70	14.00	51	3.00
1.40	12.60	15.00	51	3.00
1.50	13.50	16.50	51	3.00
1.60	14.40	17.50	51	3.00
1.70	15.30	18.50	51	3.00
1.80	16.20	19.00	51	3.00
1.90	17.10	20.00	51	3.00
2.00	18.00	21.00	51	3.00
2.10	18.90	22.00	61	3.00
2.20	19.80	23.00	61	3.00
2.30	20.70	24.00	61	3.00
2.40	21.60	24.50	61	3.00
2.50	22.50	25.50	61	3.00
2.60	23.40	26.50	61	3.00
2.70	24.30	27.50	61	3.00
2.80	25.20	28.00	61	3.00
2.90	26.10	29.00	61	3.00
3.00	27.00	31.00	61	3.00
3.10	27.90	32.00	79	6.00
3.20	28.80	33.00	79	6.00
3.30	29.70	34.00	79	6.00
3.40	30.60	35.00	79	6.00
3.50	31.50	36.50	79	6.00
3.60	32.40	37.50	79	6.00
3.70	33.30	38.50	79	6.00
3.80	34.20	39.00	79	6.00
3.90	35.10	40.00	79	6.00
4.00	36.00	41.00	79	6.00
4.10	36.90	43.00	91	6.00
4.20	37.80	44.00	91	6.00
4.30	38.70	45.00	91	6.00
4.40	39.60	45.50	91	6.00
4.50	40.50	46.50	91	6.00
4.60	41.40	49.50	91	6.00
4.70	42.30	50.50	91	6.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
4.80	43.20	51.00	91	6.00
4.90	44.10	52.00	91	6.00
5.00	45.00	53.00	91	6.00
5.10	45.90	54.00	100	6.00
5.20	46.80	55.00	100	6.00
5.30	47.70	56.00	100	6.00
5.40	48.60	57.00	100	6.00
5.50	49.50	57.50	100	6.00
5.60	50.40	58.50	100	6.00
5.70	51.30	59.50	100	6.00
5.80	52.20	60.00	100	6.00
5.90	53.10	61.00	100	6.00
6.00	54.00	62.00	100	6.00
6.10	54.90	64.00	111	8.00
6.20	55.80	65.00	111	8.00
6.30	56.70	66.00	111	8.00
6.40	57.60	66.50	111	8.00
6.50	58.50	67.50	111	8.00
6.60	59.40	68.50	111	8.00
6.70	60.30	69.50	111	8.00
6.80	61.20	70.00	111	8.00
6.90	62.10	71.00	111	8.00
7.00	63.00	73.00	111	8.00
7.10	63.90	74.00	120	8.00
7.20	64.80	75.00	120	8.00
7.30	65.70	76.00	120	8.00
7.40	66.60	76.50	120	8.00
7.50	67.50	77.50	120	8.00
7.60	68.40	78.50	120	8.00
7.70	69.30	79.50	120	8.00
7.80	70.20	80.00	120	8.00
7.90	82.00	81.00	120	8.00
8.00	72.00	82.00	120	8.00
8.50	76.50	87.50	134	10.00
9.00	81.00	92.00	134	10.00
9.50	85.50	96.50	144	10.00
10.00	90.00	102.00	144	10.00

Hochleistungsbohrer Phoenix-TC2 12×d Art. 52912

Foret à grand rendement Phoenix-TC2 12×d
Punta ad alto rendimento Phoenix-TC2 12×d
High performance drill Phoenix-TC2 12×d

P1–3 | M1,2 | K1,2 | N1–6 | S1,2 | H1 | O1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 137° | ≈30° | 12×d | AlCrTiN

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

Vc → S./p. 179

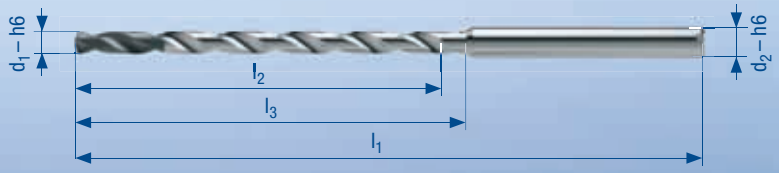
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	12.00	14.00	50	3.00
1.10	13.20	15.50	50	3.00
1.20	14.40	16.50	50	3.00
1.30	15.60	17.50	50	3.00
1.40	16.80	19.00	50	3.00
1.50	18.00	21.00	50	3.00
1.60	19.20	22.50	50	3.00
1.70	20.40	23.50	50	3.00
1.80	21.60	24.50	50	3.00
1.90	22.80	26.00	55	3.00
2.00	24.00	27.00	55	3.00
2.10	25.20	28.50	55	3.00
2.20	26.40	29.50	55	3.00
2.30	27.60	30.50	55	3.00
2.40	28.80	32.00	55	3.00
2.50	30.00	33.00	60	3.00
2.60	31.20	34.50	60	3.00
2.70	32.40	35.50	60	3.00
2.80	33.60	36.50	60	3.00
2.90	34.80	38.00	60	3.00
3.00	36.00	40.00	60	3.00
3.10	37.20	41.50	80	6.00
3.20	38.40	42.50	80	6.00
3.30	39.60	43.50	80	6.00
3.40	40.80	45.00	85	6.00
3.50	42.00	47.00	85	6.00
3.60	43.20	48.50	85	6.00
3.70	44.40	49.50	90	6.00
3.80	45.60	50.50	90	6.00
3.90	46.80	52.00	90	6.00
4.00	48.00	53.00	90	6.00
4.10	49.20	55.50	105	6.00
4.20	50.40	56.50	105	6.00
4.30	51.60	57.50	105	6.00
4.40	52.80	59.00	105	6.00
4.50	54.00	60.00	105	6.00
4.60	55.20	63.50	105	6.00
4.70	56.40	64.50	105	6.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
4.80	57.60	65.50	105	6.00
4.90	58.80	67.00	105	6.00
5.00	60.00	68.00	105	6.00
5.10	61.20	69.50	118	6.00
5.20	62.40	70.50	118	6.00
5.30	63.60	71.50	118	6.00
5.40	64.80	73.00	118	6.00
5.50	66.00	74.00	118	6.00
5.60	67.20	75.50	118	6.00
5.70	68.40	76.50	118	6.00
5.80	69.60	77.50	118	6.00
5.90	70.80	79.00	118	6.00
6.00	72.00	80.00	118	6.00
6.10	73.20	82.50	136	8.00
6.20	74.40	83.50	136	8.00
6.30	75.60	84.50	136	8.00
6.40	76.80	86.00	136	8.00
6.50	78.00	87.50	136	8.00
6.60	79.20	88.50	136	8.00
6.70	80.40	89.50	136	8.00
6.80	81.60	90.50	136	8.00
6.90	82.80	92.00	136	8.00
7.00	84.00	94.00	136	8.00
7.10	85.20	95.50	148	8.00
7.20	86.40	96.50	148	8.00
7.30	87.60	97.50	148	8.00
7.40	88.80	99.00	148	8.00
7.50	90.00	100.00	148	8.00
7.60	91.20	101.50	148	8.00
7.70	92.40	102.50	148	8.00
7.80	93.60	103.50	148	8.00
7.90	94.80	105.00	148	8.00
8.00	96.00	106.00	148	8.00
8.50	102.00	113.00	162	10.00
9.00	108.00	119.00	162	10.00
9.50	114.00	125.00	175	10.00
10.00	120.00	132.00	175	10.00

Hochleistungsbohrer Phoenix-TC2 16×d Art. 52916

Foret à grand rendement Phoenix-TC2 16×d
Punta ad alto rendimento Phoenix-TC2 16×d
High performance drill Phoenix-TC2 16×d

P3 | M1,2 | N1–3 | S1 | O1



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 137° | 30° | 16×d | AlCrTiN

mit 2 Führungsfasen
avec 2 listels
con 2 pattini di guida
with 2 guide margins

Vc → S./p. 179

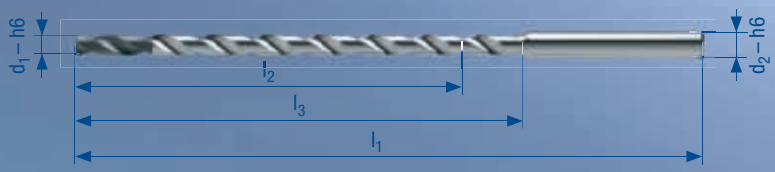
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	16.00	18.00	65	3.00
1.10	17.60	19.50	65	3.00
1.20	19.20	21.00	65	3.00
1.30	20.80	23.00	65	3.00
1.40	22.40	24.50	65	3.00
1.50	24.00	27.00	65	3.00
1.60	25.60	28.50	65	3.00
1.70	27.20	30.00	65	3.00
1.80	28.80	32.00	65	3.00
1.90	30.40	33.50	65	3.00
2.00	32.00	35.00	65	3.00
2.10	33.60	36.50	82	3.00
2.20	35.20	38.00	82	3.00
2.30	36.80	40.00	82	3.00
2.40	38.40	41.50	82	3.00
2.50	40.00	43.00	82	3.00
2.60	41.60	44.50	82	3.00
2.70	43.20	46.00	82	3.00
2.80	44.80	48.00	82	3.00
2.90	46.40	49.50	82	3.00
3.00	48.00	52.00	82	3.00
3.10	49.60	53.50	107	6.00
3.20	51.20	55.00	107	6.00
3.30	52.80	57.00	107	6.00
3.40	54.40	58.50	107	6.00
3.50	56.00	61.00	107	6.00
3.60	57.60	62.50	107	6.00
3.70	59.20	64.00	107	6.00
3.80	60.80	66.00	107	6.00
3.90	62.40	67.50	107	6.00
4.00	64.00	69.00	107	6.00
4.10	65.60	71.50	126	6.00
4.20	67.20	73.00	126	6.00
4.30	68.80	75.00	126	6.00
4.40	70.40	76.50	126	6.00
4.50	72.00	78.00	126	6.00
4.60	73.60	81.50	126	6.00
4.70	75.20	83.00	126	6.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
4.80	76.80	85.00	126	6.00
4.90	78.40	86.50	126	6.00
5.00	80.00	88.00	126	6.00
5.10	81.60	89.50	142	6.00
5.20	83.20	91.00	142	6.00
5.30	84.80	93.00	142	6.00
5.40	86.40	94.50	142	6.00
5.50	88.00	96.00	142	6.00
5.60	89.60	97.50	142	6.00
5.70	91.20	99.00	142	6.00
5.80	92.80	101.00	142	6.00
5.90	94.40	102.50	142	6.00
6.00	96.00	104.00	142	6.00
6.10	97.60	106.50	160	8.00
6.20	99.20	108.00	160	8.00
6.30	100.80	110.00	160	8.00
6.40	102.40	111.50	160	8.00
6.50	104.00	113.00	160	8.00
6.60	105.60	114.50	160	8.00
6.70	107.20	116.00	160	8.00
6.80	108.80	118.00	160	8.00
6.90	110.40	119.50	160	8.00
7.00	112.00	122.00	160	8.00
7.10	113.60	123.50	176	8.00
7.20	115.20	125.00	176	8.00
7.30	116.80	127.00	176	8.00
7.40	118.40	128.50	176	8.00
7.50	120.00	130.00	176	8.00
7.60	121.60	131.50	176	8.00
7.70	123.20	133.00	176	8.00
7.80	124.80	135.00	176	8.00
7.90	126.40	136.50	176	8.00
8.00	128.00	138.00	176	8.00
8.50	136.00	147.00	197	10.00
9.00	144.00	155.00	197	10.00
9.50	152.00	163.00	214	10.00
10.00	160.00	172.00	214	10.00

Hochleistungsbohrer Phoenix-TC2 20×d Art. 52920

Foret à grand rendement Phoenix-TC2 20×d
Punta ad alto rendimento Phoenix-TC2 20×d
High performance drill Phoenix-TC2 20×d

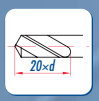
P3 M1,2 N1–3 S1 O1



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrTiN

mit 2 Führungsfasen / avec 2 listels
con 2 pattini di guida / with 2 guide margins

Anwendung / Application
Applicazione / Application
} S./p. 199

Vc → S./p. 180

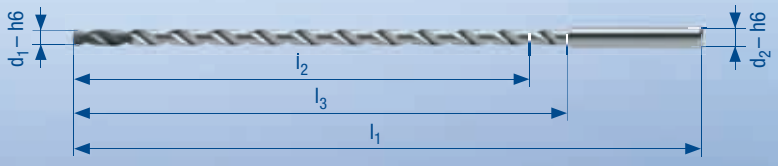


d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	60.00	69.00	108	6.00
3.30	66.00	75.00	113	6.00
4.00	80.00	94.00	132	6.00
4.20	84.00	98.00	136	6.00
5.00	100.00	107.00	145	6.00
6.00	120.00	138.00	176	6.00
6.80	136.00	156.00	196	8.00
7.00	140.00	161.00	201	8.00
8.00	160.00	182.00	222	8.00
8.50	170.00	195.00	240	10.00
9.00	180.00	207.00	252	10.00
10.00	200.00	230.00	275	10.00

Hochleistungsbohrer Phoenix-TC2 30 × d Art. 52930

Foret à grand rendement Phoenix-TC2 30 × d
Punta ad alto rendimento Phoenix-TC2 30 × d
High performance drill Phoenix-TC2 30 × d

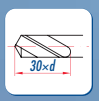
P3 | M1,2 | N1–3 | S1 | 01



VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrTiN

mit 2 Führungsfasen / avec 2 listels
con 2 pattini di guida / with 2 guide margins

Anwendung / Application
Applicazione / Application
} S./p. 199

Vc → S./p. 180

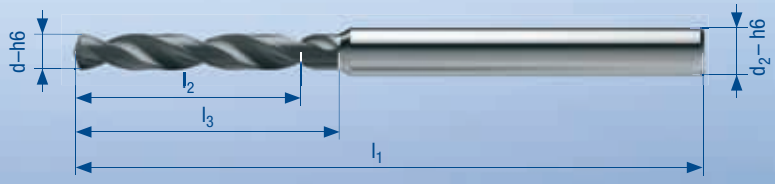


d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	90.00	99.00	138	6.00
3.30	99.00	108.00	146	6.00
4.00	120.00	134.00	172	6.00
4.20	126.00	140.00	178	6.00
5.00	150.00	167.00	205	6.00
6.00	180.00	198.00	236	6.00
6.80	204.00	224.00	264	8.00
7.00	210.00	231.00	271	8.00
8.00	240.00	262.00	302	8.00
8.50	255.00	280.00	325	10.00
9.00	270.00	297.00	342	10.00
10.00	285.00	300.00	345	10.00

Hochleistungsbohrer Phoenix-TC4 6×d Art. 54906

Foret à grand rendement Phoenix-TC4 6×d
Punta ad alto rendimento Phoenix-TC4 6×d
High performance drill Phoenix-TC4 6×d

P1,2 K1,2 N3,5



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 6×d | AlTiCrN+S

mit 4 Führungsfasen
avec 4 listels
con 4 pattini di guida
with 4 guide margins

Vc → S./p. 180

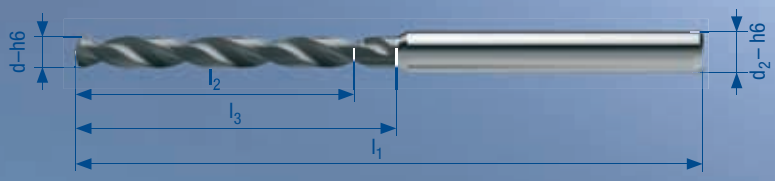
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	18.00	18.00	50	3.00
3.10	18.60	22.60	66	6.00
3.20	19.20	23.20	66	6.00
3.30	19.80	23.80	66	6.00
3.40	20.40	24.40	66	6.00
3.50	21.00	25.00	66	6.00
3.60	21.60	25.60	66	6.00
3.70	22.20	26.20	66	6.00
3.80	22.80	26.80	66	6.00
3.90	23.40	27.40	66	6.00
4.00	24.00	28.00	66	6.00
4.10	24.60	30.50	79	6.00
4.20	25.20	31.00	79	6.00
4.30	25.80	32.00	79	6.00
4.40	26.40	32.50	79	6.00
4.50	27.00	33.00	79	6.00
4.60	27.60	35.50	79	6.00
4.70	28.20	36.00	79	6.00
4.80	28.80	37.00	79	6.00
4.90	29.40	37.50	79	6.00
5.00	30.00	38.00	79	6.00
5.10	30.60	38.50	79	6.00
5.20	31.20	39.00	79	6.00
5.30	31.80	40.00	79	6.00
5.40	32.40	40.50	79	6.00
5.50	33.00	41.00	79	6.00
5.60	33.60	41.50	81	6.00
5.70	34.20	42.00	81	6.00
5.80	34.80	43.00	81	6.00
5.90	35.40	43.50	81	6.00
6.00	36.00	44.00	81	6.00
6.10	36.60	45.50	89	8.00
6.20	37.20	46.00	89	8.00
6.30	37.80	47.00	89	8.00
6.40	38.40	47.50	89	8.00
6.50	39.00	48.00	89	8.00
6.60	39.60	48.50	89	8.00
6.70	40.20	49.00	89	8.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
6.80	40.80	50.00	89	8.00
6.90	41.40	50.50	89	8.00
7.00	42.00	52.00	89	8.00
7.10	42.60	52.50	95	8.00
7.20	43.20	53.50	95	8.00
7.30	43.80	54.00	95	8.00
7.40	44.40	54.50	95	8.00
7.50	45.00	55.00	95	8.00
7.60	45.60	55.50	95	8.00
7.70	46.20	56.00	95	8.00
7.80	46.80	57.00	95	8.00
7.90	47.40	57.50	95	8.00
8.00	48.00	58.00	95	8.00
8.50	51.00	62.00	106	10.00
9.00	54.00	65.00	106	10.00
9.50	57.00	68.00	113	10.00
10.00	60.00	72.00	113	10.00

Hochleistungsbohrer Phoenix-TC4 9×d Art. 54909

Foret à grand rendement Phoenix-TC4 9×d
Punta ad alto rendimento Phoenix-TC4 9×d
High performance drill Phoenix-TC4 9×d

P1,2 K1,2 N3,5



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 140° | ≈30° | 9×d | AlTiCrN+S

mit 4 Führungsfasen
avec 4 listels
con 4 pattini di guida
with 4 guide margins

Vc → S./p. 180

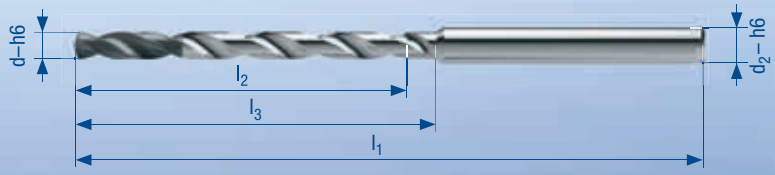
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	27.00	31.00	61	3.00
3.10	27.90	32.00	79	6.00
3.20	28.80	33.00	79	6.00
3.30	29.70	34.00	79	6.00
3.40	30.60	35.00	79	6.00
3.50	31.50	36.50	79	6.00
3.60	32.40	37.50	79	6.00
3.70	33.30	38.50	79	6.00
3.80	34.20	39.00	79	6.00
3.90	35.10	40.00	79	6.00
4.00	36.00	41.00	79	6.00
4.10	36.90	43.00	91	6.00
4.20	37.80	44.00	91	6.00
4.30	38.70	45.00	91	6.00
4.40	39.60	45.50	91	6.00
4.50	40.50	46.50	91	6.00
4.60	41.40	49.50	91	6.00
4.70	42.30	50.50	91	6.00
4.80	43.20	51.00	91	6.00
4.90	44.10	52.00	91	6.00
5.00	45.00	53.00	91	6.00
5.10	45.90	54.00	100	6.00
5.20	46.80	55.00	100	6.00
5.30	47.70	56.00	100	6.00
5.40	48.60	57.00	100	6.00
5.50	49.50	57.50	100	6.00
5.60	50.40	58.50	100	6.00
5.70	51.30	59.50	100	6.00
5.80	52.20	60.00	100	6.00
5.90	53.10	61.00	100	6.00
6.00	54.00	62.00	100	6.00
6.10	54.90	64.00	111	8.00
6.20	55.80	65.00	111	8.00
6.30	56.70	66.00	111	8.00
6.40	57.60	66.50	111	8.00
6.50	58.50	67.50	111	8.00
6.60	59.40	68.50	111	8.00
6.70	60.30	69.50	111	8.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
6.80	61.20	70.00	111	8.00
6.90	62.10	71.00	111	8.00
7.00	63.00	73.00	111	8.00
7.10	63.90	74.00	120	8.00
7.20	64.80	75.00	120	8.00
7.30	65.70	76.00	120	8.00
7.40	66.60	76.50	120	8.00
7.50	67.50	77.50	120	8.00
7.60	68.40	78.50	120	8.00
7.70	69.30	79.50	120	8.00
7.80	70.20	80.00	120	8.00
7.90	82.00	81.00	120	8.00
8.00	72.00	82.00	120	8.00
8.50	76.50	87.50	134	10.00
9.00	81.00	92.00	134	10.00
9.50	85.50	96.50	144	10.00
10.00	90.00	102.00	144	10.00

Hochleistungsbohrer Phoenix-TC4 12×d Art. 54912

Foret à grand rendement Phoenix-TC4 12×d
Punta ad alto rendimento Phoenix-TC4 12×d
High performance drill Phoenix-TC4 12×d

P1,2 K1,2 N3,5



VHM MD/SC | SPHINX NORM | Typ N | Z 2 | 137° | 30° | 12×d | AlCrTiN

mit 4 Führungsfasen
avec 4 listels
con 4 pattini di guida
with 4 guide margins

Vc → S./p. 181

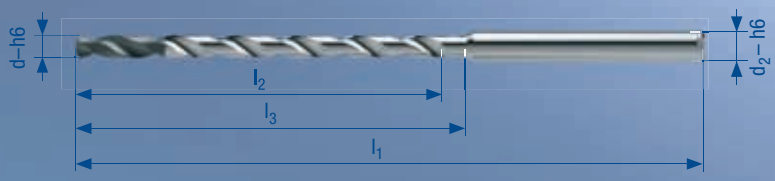
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	36.00	40.00	60	3.00
3.10	37.20	41.50	80	6.00
3.20	38.40	42.50	80	6.00
3.30	39.60	43.50	80	6.00
3.40	40.80	45.00	85	6.00
3.50	42.00	47.00	85	6.00
3.60	43.20	48.50	85	6.00
3.70	44.40	49.50	90	6.00
3.80	45.60	50.50	90	6.00
3.90	46.80	52.00	90	6.00
4.00	48.00	53.00	90	6.00
4.10	49.20	55.50	105	6.00
4.20	50.40	56.50	105	6.00
4.30	51.60	57.50	105	6.00
4.40	52.80	59.00	105	6.00
4.50	54.00	60.00	105	6.00
4.60	55.20	63.50	105	6.00
4.70	56.40	64.50	105	6.00
4.80	57.60	65.50	105	6.00
4.90	58.80	67.00	105	6.00
5.00	60.00	68.00	105	6.00
5.10	61.20	69.50	118	6.00
5.20	62.40	70.50	118	6.00
5.30	63.60	71.50	118	6.00
5.40	64.80	73.00	118	6.00
5.50	66.00	74.00	118	6.00
5.60	67.20	75.50	118	6.00
5.70	68.40	76.50	118	6.00
5.80	69.60	77.50	118	6.00
5.90	70.80	79.00	118	6.00
6.00	72.00	80.00	118	6.00
6.10	73.20	82.50	136	8.00
6.20	74.40	83.50	136	8.00
6.30	75.60	84.50	136	8.00
6.40	76.80	86.00	136	8.00
6.50	78.00	87.50	136	8.00
6.60	79.20	88.50	136	8.00
6.70	80.40	89.50	136	8.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
6.80	81.60	90.50	136	8.00
6.90	82.80	92.00	136	8.00
7.00	84.00	94.00	136	8.00
7.10	85.20	95.50	148	8.00
7.20	86.40	96.50	148	8.00
7.30	87.60	97.50	148	8.00
7.40	88.80	99.00	148	8.00
7.50	90.00	100.00	148	8.00
7.60	91.20	101.50	148	8.00
7.70	92.40	102.50	148	8.00
7.80	93.60	103.50	148	8.00
7.90	94.80	105.00	148	8.00
8.00	96.00	106.00	148	8.00
8.50	102.00	113.00	162	10.00
9.00	108.00	119.00	162	10.00
9.50	114.00	125.00	175	10.00
10.00	120.00	132.00	175	10.00

Hochleistungsbohrer Phoenix-TC4 16×d Art. 54916

Foret à grand rendement Phoenix-TC4 16×d
Punta ad alto rendimento Phoenix-TC4 16×d
High performance drill Phoenix-TC4 16×d

P1,2 K1,2 N3,5



VHM MD/SC | SPHINX NORM | 137° | Typ N | Z 2 | ≈30° | 16×d | AlCrTiN

mit 4 Führungsfasen
avec 4 listels
con 4 pattini di guida
with 4 guide margins

Vc → S./p. 181

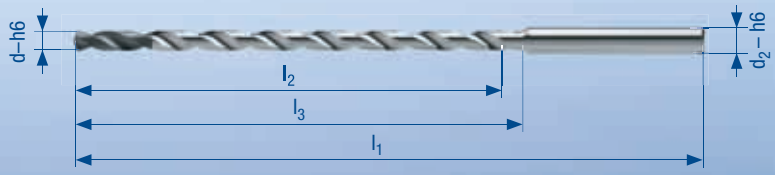
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	48.00	52.00	82	3.00
3.10	49.60	53.50	107	6.00
3.20	51.20	55.00	107	6.00
3.30	52.80	57.00	107	6.00
3.40	54.40	58.50	107	6.00
3.50	56.00	61.00	107	6.00
3.60	57.60	62.50	107	6.00
3.70	59.20	64.00	107	6.00
3.80	60.80	66.00	107	6.00
3.90	62.40	67.50	107	6.00
4.00	64.00	69.00	107	6.00
4.10	65.60	71.50	126	6.00
4.20	67.20	73.00	126	6.00
4.30	68.80	75.00	126	6.00
4.40	70.40	76.50	126	6.00
4.50	72.00	78.00	126	6.00
4.60	73.60	81.50	126	6.00
4.70	75.20	83.00	126	6.00
4.80	76.80	85.00	126	6.00
4.90	78.40	86.50	126	6.00
5.00	80.00	88.00	126	6.00
5.10	81.60	89.50	142	6.00
5.20	83.20	91.00	142	6.00
5.30	84.80	93.00	142	6.00
5.40	86.40	94.50	142	6.00
5.50	88.00	96.00	142	6.00
5.60	89.60	97.50	142	6.00
5.70	91.20	99.00	142	6.00
5.80	92.80	101.00	142	6.00
5.90	94.40	102.50	142	6.00
6.00	96.00	104.00	142	6.00
6.10	97.60	106.50	160	8.00
6.20	99.20	108.00	160	8.00
6.30	100.80	110.00	160	8.00
6.40	102.40	111.50	160	8.00
6.50	104.00	113.00	160	8.00
6.60	105.60	114.50	160	8.00
6.70	107.20	116.00	160	8.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
6.80	108.80	118.00	160	8.00
6.90	110.40	119.50	160	8.00
7.00	112.00	122.00	160	8.00
7.10	113.60	123.50	176	8.00
7.20	115.20	125.00	176	8.00
7.30	116.80	127.00	176	8.00
7.40	118.40	128.50	176	8.00
7.50	120.00	130.00	176	8.00
7.60	121.60	131.50	176	8.00
7.70	123.20	133.00	176	8.00
7.80	124.80	135.00	176	8.00
7.90	126.40	136.50	176	8.00
8.00	128.00	138.00	176	8.00
8.50	136.00	147.00	197	10.00
9.00	144.00	155.00	197	10.00
9.50	152.00	163.00	214	10.00
10.00	160.00	172.00	214	10.00

Hochleistungsbohrer Phoenix-TC4 20 × d Art. 54920

Foret à grand rendement Phoenix-TC4 20 × d
Punta ad alto rendimento Phoenix-TC4 20 × d
High performance drill Phoenix-TC4 20 × d

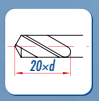
P1,2 K1,2 N3,5



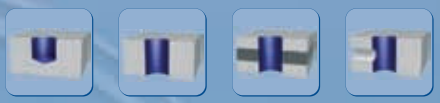
VHM MD/SC | SPHINX NORM

Typ N

Z 2



AlCrTiN



mit 4 Führungsfasen / avec 4 listels
con 4 pattini di guida / with 4 guide margins

Anwendung / Application
Applicazione / Application
} S./p. 199

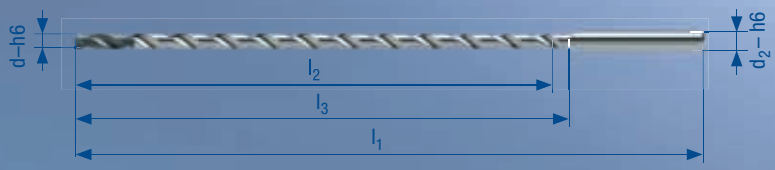
Vc → S./p. 181

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	60.00	69.00	108	6.00
3.30	66.00	75.00	113	6.00
4.00	80.00	94.00	132	6.00
4.20	84.00	98.00	136	6.00
5.00	100.00	107.00	145	6.00
6.00	120.00	138.00	176	6.00
6.80	136.00	156.00	196	8.00
7.00	140.00	161.00	201	8.00
8.00	160.00	182.00	222	8.00
8.50	170.00	195.00	240	10.00
9.00	180.00	207.00	252	10.00
10.00	200.00	230.00	275	10.00

Hochleistungsbohrer Phoenix-TC4 30 × d Art. 54930

Foret à grand rendement Phoenix-TC4 30 × d
Punta ad alto rendimento Phoenix-TC4 30 × d
High performance drill Phoenix-TC4 30 × d

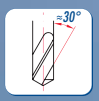
P1,2 K1,2 N3,5

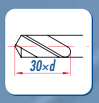


VHM MD/SC | SPHINX NORM

Typ N

Z 2





AlCrTiN

mit 4 Führungsfasen / avec 4 listels
con 4 pattini di guida / with 4 guide margins

Anwendung / Application
Applicazione / Application
} S./p. 199

Vc → S./p. 181

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	90.00	99.00	138	6.00
3.30	99.00	108.00	146	6.00
4.00	120.00	134.00	172	6.00
4.20	126.00	140.00	178	6.00
5.00	150.00	167.00	205	6.00
6.00	180.00	198.00	236	6.00
6.80	204.00	224.00	264	8.00
7.00	210.00	231.00	271	8.00
8.00	240.00	262.00	302	8.00
8.50	255.00	280.00	325	10.00
9.00	270.00	297.00	342	10.00
10.00	285.00	300.00	345	10.00

Bohrreibahle Asycut 5 × d

Art. 50840

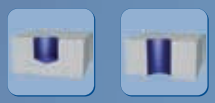
Foret alésoir Asycut 5 × d

Punta alesatore Asycut 5 × d

Drill reamer Asycut 5 × d

P1,2 | M1,2 | K1,2 | N1–4

VHM MD/SC | DIN 6539 | Typ N | Z 2 | H7 – H9



Vc → S./p. 182

d_1 mm	l_2 mm	l_1 mm
2.00	11.50	38
2.10	11.50	38
2.20	12.50	40
2.30	12.50	40
2.40	13.50	43
2.50	13.50	43
2.60	13.50	43
2.70	15.50	46
2.80	15.50	46
2.90	15.50	46
3.00	15.50	46
3.10	17.50	49
3.20	17.50	49
3.30	17.50	49
3.40	19.50	52
3.50	19.50	52
3.60	19.50	52
3.70	19.50	52
3.80	21.50	55
3.90	21.50	55
4.00	21.50	55
4.10	21.50	55
4.20	21.50	55
4.30	23.00	58
4.40	23.00	58
4.50	23.00	58
4.60	23.00	58
4.70	23.00	58
4.80	25.00	62
4.90	25.00	62
5.00	25.00	62
5.10	25.00	62
5.20	25.00	62
5.30	25.00	62
5.40	27.00	66
5.50	27.00	66
5.60	27.00	66
5.70	27.00	66

d_1 mm	l_2 mm	l_1 mm
5.80	27.00	66
5.90	27.00	66
6.00	27.00	66
6.10	30.00	70
6.20	30.00	70
6.30	30.00	70
6.40	30.00	70
6.50	30.00	70
6.60	30.00	70
6.70	30.00	70
6.80	33.00	74
6.90	33.00	74
7.00	33.00	74
7.10	33.00	74
7.20	33.00	74
7.30	33.00	74
7.40	33.00	74
7.50	33.00	74
7.60	36.00	79
7.70	36.00	79
7.80	36.00	79
7.90	36.00	79
8.00	36.00	79
8.10	36.00	79
8.20	36.00	79
8.30	36.00	79
8.40	36.00	79
8.50	36.00	79
8.60	39.00	84
8.70	39.00	84
8.80	39.00	84
8.90	39.00	84
9.00	39.00	84
9.10	39.00	84
9.20	39.00	84
9.30	39.00	84
9.40	39.00	84
9.50	39.00	84

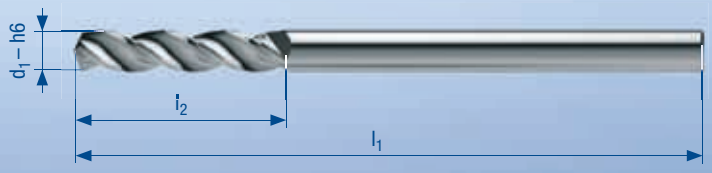
d_1 mm	l_2 mm	l_1 mm
9.60	41.00	89
9.70	41.00	89
9.80	41.00	89
9.90	41.00	89
10.00	41.00	89
10.20	41.00	89
10.50	41.00	89
11.00	45.00	95
11.50	45.00	95
12.00	49.00	102
12.50	49.00	102
13.00	49.00	102
13.50	52.00	107
14.00	52.00	107

Bohrreibahle Tricut 5 × d

Foret alésoir Tricut 5 × d
Punta alesatore Tricut 5 × d
Drill reamer Tricut 5 × d

Art. 55654

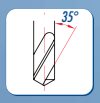
P1,2 | M1 | K1,2 | N2,3 | S1

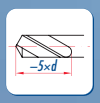


VHM MD/SC | DIN 6539

H7 – H9

Z 3





Zwischenmasse erhältlich
Dimensions intermédiaire disponible
Quote intermediarie disponibili
Intermediate sizes available

Vc → S./p. 182

d_1 mm		l_2 mm	l_1 mm
1.00		6.0	26
1.10		6.5	28
1.20		7.5	30
1.30		7.5	30
1.40		8.5	32
1.50		8.5	32
1.60		9.5	34
1.70		9.5	34
1.80		10.5	36
1.90		10.5	36
2.00		11.5	38
2.10		11.5	38
2.20		12.5	40
2.30		12.5	40
2.40		13.5	43
2.50		13.5	43
2.60		13.5	43
2.70		15.5	46
2.80		15.5	46
2.90		15.5	46
3.00		15.5	46
3.10		17.0	49
3.175	1/8“	17.0	49
3.20		17.0	49
3.30		17.0	49
3.40		19.0	52
3.50		19.0	52
3.60		19.0	52
3.70		19.0	52
3.80		21.0	55
3.90		21.0	55
3.969	5/32“	21.0	55
4.00		21.0	55
4.10		21.0	55
4.20		21.0	55
4.30		22.5	58
4.40		22.5	58
4.50		22.5	58

d_1 mm		l_2 mm	l_1 mm
4.60		22.5	58
4.70		22.5	58
4.763	3/16“	24.5	62
4.80		24.5	62
4.90		24.5	62
5.00		24.5	62
5.10		24.5	62
5.20		24.5	62
5.30		24.5	62
5.40		26.0	66
5.50		26.0	66
5.556	7/32“	26.0	66
5.60		26.0	66
5.70		26.0	66
5.80		26.0	66
5.90		26.0	66
6.00		26.0	66
6.10		28.5	70
6.20		28.5	70
6.30		28.5	70
6.350	1/4“	28.5	70
6.40		28.5	70
6.50		28.5	70
6.60		28.5	70
6.70		28.5	70
6.80		31.0	74
6.90		31.0	74
7.00		31.0	74
7.10		31.0	74
7.144	9/32“	31.0	74
7.20		31.0	74
7.30		31.0	74
7.40		31.0	74
7.50		31.0	74
7.60		34.0	79
7.70		34.0	79
7.80		34.0	79
7.90		34.0	79

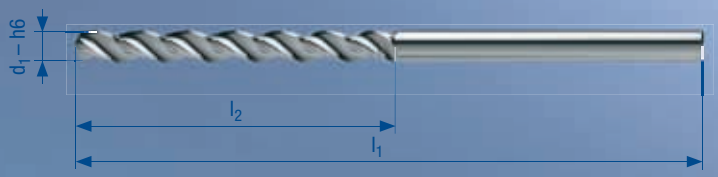
d_1 mm		l_2 mm	l_1 mm
7.938	5/16“	34.0	79
8.00		34.0	79
8.10		34.0	79
8.20		34.0	79
8.30		34.0	79
8.40		34.0	79
8.50		34.0	79
8.60		36.5	84
8.70		36.5	84
8.80		36.5	84
8.90		36.5	84
9.00		36.5	84
9.10		36.5	84
9.20		36.5	84
9.30		36.5	84
9.40		36.5	84
9.50		36.5	84
9.525	3/8“	39.0	89
9.60		39.0	89
9.70		39.0	89
9.80		39.0	89
9.90		39.0	89
10.00		39.0	89
10.20		39.0	89
10.50		39.0	89
11.00		43.0	95
11.113	7/16“	43.0	95
11.50		43.0	95
12.00		47.0	102
12.50		47.0	102
12.700	1/2“	47.0	102
13.00		47.0	102
13.50		50.0	107
14.00		50.0	107

Bohrreibahle Tricut long 10 × d

Art. 55338

Foret alésoir Tricut long 10 × d
Punta alesatore Tricut long 10 × d
Drill reamer Tricut long 10 × d

P1,2 | M1 | K1,2 | N2,3 | S1



VHM MD/SC | DIN 338 | 140° | Typ N | Z 3 | H7 – H9 | 35° | –10×d

Zwischenmasse erhältlich
Dimensions intermédiaire disponible
Quote intermediarie disponibili
Intermediate sizes available

Vc → S./p. 182

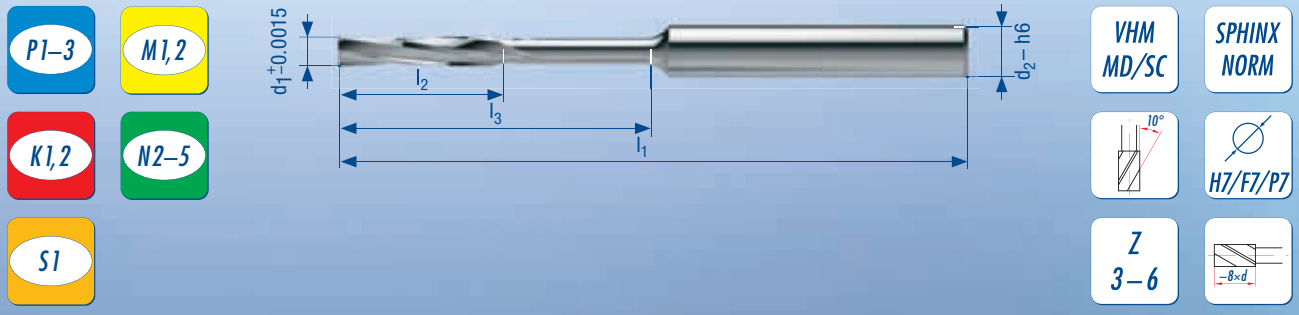
d_1 mm	l_2 mm	l_1 mm
1.00	11.5	34
1.10	13.0	36
1.20	15.0	38
1.30	15.0	38
1.40	17.0	40
1.50	17.0	40
1.60	19.0	43
1.70	19.0	43
1.80	21.0	46
1.90	21.0	46
2.00	22.0	49
2.10	22.0	49
2.20	25.0	53
2.30	25.0	53
2.40	28.0	57
2.50	28.0	57
2.60	28.0	57
2.70	31.0	61
2.80	31.0	61
2.90	31.0	61
3.00	31.0	61
3.10	34.0	65
3.20	34.0	65
3.30	34.0	65
3.40	37.0	70
3.50	37.0	70
3.60	37.0	70
3.70	37.0	70
3.80	41.0	75
3.90	41.0	75
4.00	41.0	75
4.10	41.0	75
4.20	41.0	75
4.30	45.0	80
4.40	45.0	80
4.50	45.0	80
4.60	45.0	80
4.70	45.0	80

d_1 mm	l_2 mm	l_1 mm
4.80	50.0	86
4.90	50.0	86
5.00	50.0	86
5.10	50.0	86
5.20	50.0	86
5.30	50.0	86
5.40	55.0	93
5.50	55.0	93
5.60	55.0	93
5.70	55.0	93
5.80	55.0	93
5.90	55.0	93
6.00	55.0	93
6.10	60.0	101
6.20	60.0	101
6.30	60.0	101
6.40	60.0	101
6.50	60.0	101
6.60	60.0	101
6.70	60.0	101
6.80	66.0	109
6.90	66.0	109
7.00	66.0	109
7.10	66.0	109
7.20	66.0	109
7.30	66.0	109
7.40	66.0	109
7.50	66.0	109
7.60	72.0	117
7.70	72.0	117
7.80	72.0	117
7.90	72.0	117
8.00	72.0	117
8.10	72.0	117
8.20	72.0	117
8.30	72.0	117
8.40	72.0	117
8.50	72.0	117

d_1 mm	l_2 mm	l_1 mm
8.60	78.0	125
8.70	78.0	125
8.80	78.0	125
8.90	78.0	125
9.00	78.0	125
9.10	78.0	125
9.20	78.0	125
9.30	78.0	125
9.40	78.0	125
9.50	78.0	125
9.60	84.0	133
9.70	84.0	133
9.80	84.0	133
9.90	84.0	133
10.00	84.0	133
10.20	84.0	133
10.50	84.0	133
11.00	91.0	142
11.50	91.0	142
12.00	98.0	151
12.50	98.0	151
13.00	98.0	151
13.50	105.0	160
14.00	105.0	160

Reibahle mit verstärktem Schaft — Art. 58000

Alésoir avec manche renforcé
Alesatore con gambo rinforzato
Reamer with reinforced shank



Zwischenmasse erhältlich
Dimensions intermédiaire disponible
Quote intermediarie disponibili
Intermediate sizes available

Vc → S./p. 183

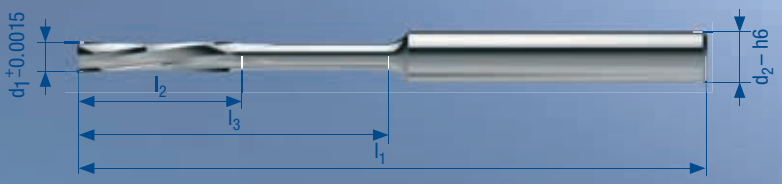
Nr.	ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
099	1.0–P7	0.987	8.00	16.00	48	3.00	3
100	1.0–H7	1.005	8.00	16.00	48	3.00	3
101	1.0–F7	1.011	8.00	16.00	48	3.00	3
199	2.0–P7	1.987	11.00	22.00	54	3.00	4
200	2.0–H7	2.005	11.00	22.00	54	3.00	4
201	2.0–F7	2.011	11.00	22.00	54	3.00	4
299	3.0–P7	2.987	15.00	30.00	60	3.00	4
300	3.0–H7	3.005	15.00	30.00	60	3.00	4
301	3.0–F7	3.011	15.00	30.00	60	3.00	4
399	4.0–P7	3.986	19.00	38.00	76	6.00	6
400	4.0–H7	4.006	19.00	38.00	76	6.00	6
401	4.0–F7	4.016	19.00	38.00	76	6.00	6
499	5.0–P7	4.986	23.00	46.00	84	6.00	6
500	5.0–H7	5.006	23.00	46.00	84	6.00	6
501	5.0–F7	5.018	23.00	46.00	84	6.00	6
599	6.0–P7	5.986	26.00	52.00	90	6.00	6
600	6.0–H7	6.006	26.00	52.00	90	6.00	6
601	6.0–F7	6.018	26.00	52.00	90	6.00	6

Reibahle mit verstärktem Schaft

Art. 58500

Alésoir avec manche renforcé
Alesatore con gambo rinforzato
Reamer with reinforced shank

P1–3 | M1,2 | K1,2 | N2–5 | S1



VHM MD/SC | SPHINX NORM | 10° | H7/F7/P7 | Z 3–6 | –8×d

Zwischenmasse erhältlich
Dimensions intermédiaire disponible
Quote intermediarie disponibili
Intermediate sizes available

Vc → S./p. 183

Nr.	ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
099	1.0–P7	0.987	8.00	16.00	48	3.00	3
100	1.0–H7	1.005	8.00	16.00	48	3.00	3
101	1.0–F7	1.011	8.00	16.00	48	3.00	3
199	2.0–P7	1.987	11.00	22.00	54	3.00	4
200	2.0–H7	2.005	11.00	22.00	54	3.00	4
201	2.0–F7	2.011	11.00	22.00	54	3.00	4
299	3.0–P7	2.987	15.00	30.00	60	3.00	4
300	3.0–H7	3.005	15.00	30.00	60	3.00	4
301	3.0–F7	3.011	15.00	30.00	60	3.00	4
399	4.0–P7	3.986	19.00	38.00	76	6.00	6
400	4.0–H7	4.006	19.00	38.00	76	6.00	6
401	4.0–F7	4.016	19.00	38.00	76	6.00	6
499	5.0–P7	4.986	23.00	46.00	84	6.00	6
500	5.0–H7	5.006	23.00	46.00	84	6.00	6
501	5.0–F7	5.018	23.00	46.00	84	6.00	6
599	6.0–P7	5.986	26.00	52.00	90	6.00	6
600	6.0–H7	6.006	26.00	52.00	90	6.00	6
601	6.0–F7	6.018	26.00	52.00	90	6.00	6

Fräsen
Fraisage
Fresare
Milling

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Increments	Bearbeitungs-tiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	
Fräser Fraise							
	40000	2.00–20.00	0.50	DIN 6528		30°	
	40600	2.00–20.00	0.50	DIN 6529		30°	
	40002	2.00–20.00	0.50	DIN 6530		30°	
	40602	2.00–20.00	0.50	DIN 6531		30°	
	40004	2.00–20.00	0.50	DIN 6532		30°	
	40604	2.00–20.00	0.50	DIN 6533		30°	
	40006	4.00–20.00	0.50	DIN 6534		45°	
	40008	4.00–20.00	0.50	DIN 6535		55°	
	47000	3.00–20.00	1.00	1.5–4×ø		55°	
	47500	6.00–20.00	2.00	4.5–8×ø		55°	
	47344	0.50–8.00	0.10	1–3×ø		0°	

* siehe Legende S. 192 + 193
see legend p. 192 + 193

✓ hervorragend / outstanding
• geeignet / able

Material	Werkstoffgruppe* Workpiece material* P	M	K	S	N	H	O	Anwendung* Application*	Seite Page
Fresa End mill									
VHM / MD / SC	•		•		✓		•		135
VHM / MD / SC; TiAlN+AlCrN	✓	•	✓		✓	✓			136
VHM / MD / SC	✓	•	✓		✓				137
VHM / MD / SC; TiAlN+AlCrN	✓	•	✓		✓	✓			138
VHM / MD / SC	✓	•	✓						139
VHM / MD / SC; TiAlN+AlCrN	✓	•	✓	•		✓			140
VHM / MD / SC	✓	✓	✓	•					141
VHM / MD / SC	✓	✓	✓	•					142
VHM / MD / SC					✓		•		143
VHM / MD / SC					✓		•		144
VHM / MD / SC	•	•	•		✓				145

Schaftfräser 2Z 30°

Art. 40000

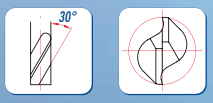
Fraise 2d 30°
Fresa 2d 30°
End mill 2t 30°

P1,2 K1,2 N1–6

VHM MD/SC

DIN 6528

Z 2



Vc → S./p. 183

d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	8.00	50	2.00
2.50	8.00	50	2.50
3.00	8.00	50	3.00
3.50	8.00	50	3.50
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

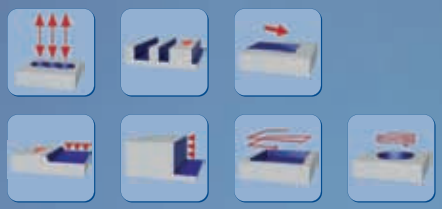
Schaftfräser 2Z 30°

Fraise 2d 30°
Fresa 2d 30°
End mill 2t 30°

Art. 40600

P1–3 | M1 | K1,2 | N2,3,5

VHM MD/SC | DIN 6528 | Z 2 | 30° | TiAlN+ AlCrN



Vc → S./p. 184

d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	8.00	50	2.00
2.50	8.00	50	2.50
3.00	8.00	50	3.00
3.50	8.00	50	3.50
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

Schaftfräser 3Z 30°

Art. 40002

Fraise 3d 30°

Fresa 3d 30°

End mill 3t 30°

P1–3 | M1 | K1,2

VHM MD/SC | DIN 6528 | Z 3

Vc → S./p. 184

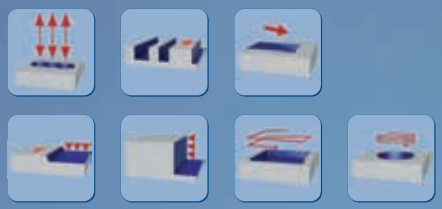
d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	8.00	50	2.00
2.50	8.00	50	2.50
3.00	8.00	50	3.00
3.50	8.00	50	3.50
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

Schaftfräser 3Z 30°
Fraise 3d 30°
Fresa 3d 30°
End mill 3t 30°

Art. 40602

P1–3 | M1 | K1,2 | H1–3

VHM MD/SC | DIN 6528 | Z 3 | 30° | TiAlN+ AlCrN



Vc → S./p. 185

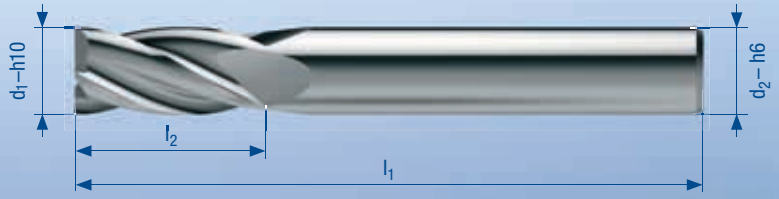
d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	8.00	50	2.00
2.50	8.00	50	2.50
3.00	8.00	50	3.00
3.50	8.00	50	3.50
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

Schaftfräser 4Z 30°

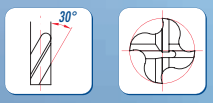
Fraise 4d 30°
Fresa 4d 30°
End mill 4t 30°

Art. 40004

P1–3 | M1 | K1,2



VHM MD/SC | DIN 6528 | Z 4



Vc → S./p. 185

d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	10.00	50	2.00
2.50	10.00	50	2.50
3.00	10.00	50	3.00
3.50	10.00	50	3.50
4.00	11.00	50	4.00
4.50	11.00	50	4.50
5.00	13.00	50	5.00
5.50	13.00	57	5.50
6.00	13.00	57	6.00
7.00	16.00	60	7.00
8.00	19.00	63	8.00
9.00	19.00	67	9.00
10.00	22.00	72	10.00
11.00	26.00	83	11.00
12.00	26.00	83	12.00
14.00	26.00	83	14.00
16.00	32.00	92	16.00
18.00	32.00	92	18.00
20.00	38.00	104	20.00

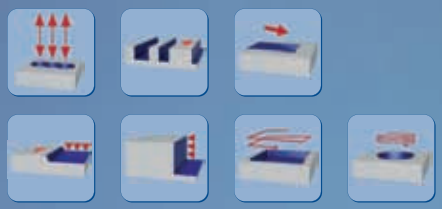
Schaftfräser 4Z 30°

Fraise 4d 30°
Fresa 4d 30°
End mill 4t 30°

Art. 40604

P1–3 | M1 | K1,2 | H1–3

VHM MD/SC | DIN 6528 | Z 4 | 30° | TiAlN+ AlCrN



Vc → S./p. 186

d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	10.00	50	2.00
2.50	10.00	50	2.50
3.00	10.00	50	3.00
3.50	10.00	50	3.50
4.00	11.00	50	4.00
4.50	11.00	50	4.50
5.00	13.00	50	5.00
5.50	13.00	57	5.50
6.00	13.00	57	6.00
7.00	16.00	60	7.00
8.00	19.00	63	8.00
9.00	19.00	67	9.00
10.00	22.00	72	10.00
11.00	26.00	83	11.00
12.00	26.00	83	12.00
14.00	26.00	83	14.00
16.00	32.00	92	16.00
18.00	32.00	92	18.00
20.00	38.00	104	20.00

Schaftfräser 3Z 45°

Art. 40006

Fraise 3d 45°

Fresa 3d 45°

End mill 3t 45°

P1–3 | M1,2 | K1,2 | S1

VHM MD/SC | DIN 6528 | Z 3

Vc → S./p. 186

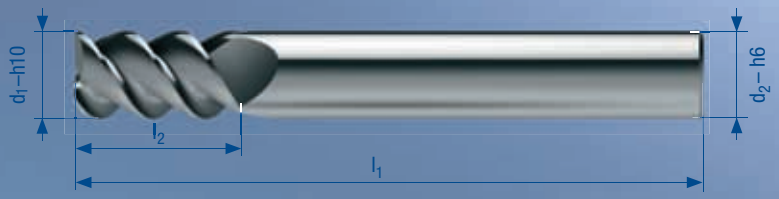
d_1 mm	l_2 mm	l_1 mm	d_2 mm
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

Schaftfräser 3Z 60°

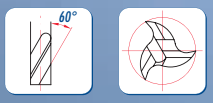
Fraise 3d 60°
Fresa 3d 60°
End mill 3t 60°

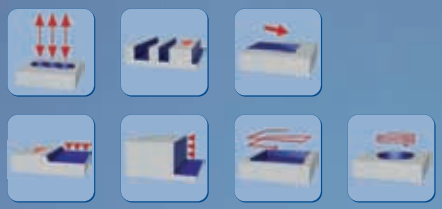
Art. 40008

P1–3 | M1,2 | K1,2 | S1



VHM MD/SC | DIN 6528 | Z 3





Vc → S./p. 186

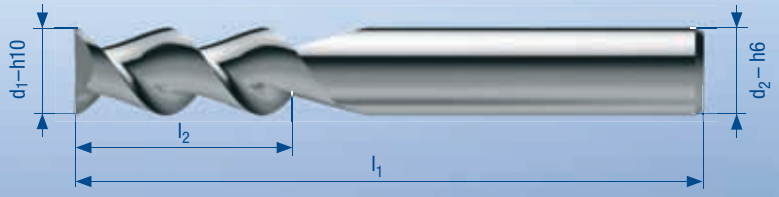
d_1 mm	l_2 mm	l_1 mm	d_2 mm
4.00	8.00	50	4.00
4.50	8.00	50	4.50
5.00	10.00	50	5.00
5.50	10.00	57	5.50
6.00	10.00	57	6.00
7.00	13.00	60	7.00
8.00	16.00	63	8.00
9.00	16.00	67	9.00
10.00	19.00	72	10.00
11.00	22.00	83	11.00
12.00	22.00	83	12.00
14.00	22.00	83	14.00
16.00	26.00	92	16.00
18.00	26.00	92	18.00
20.00	32.00	104	20.00

Schaftfräser AC2 55°
Fraise AC2 55°
Fresa AC2 55°
End mill AC2 55°

Art. 47000

N1–3

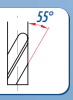
01



VHM MD/SC

SPHINX NORM

Z 2



Vc → S./p. 187

d_1 mm	l_2 mm	l_1 mm	d_2 mm
3.00	12.00	50	3.00
4.00	15.00	50	4.00
5.00	20.00	50	5.00
6.00	20.00	57	6.00
8.00	20.00	63	8.00
10.00	25.00	72	10.00
12.00	25.00	83	12.00
14.00	30.00	90	14.00
16.00	30.00	92	16.00
20.00	38.00	104	20.00

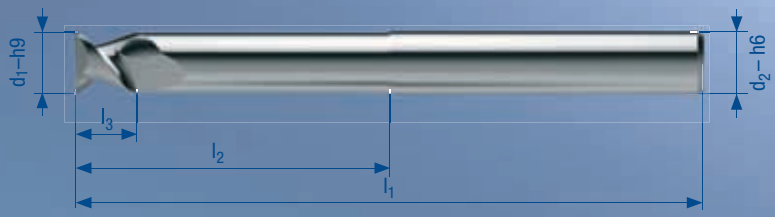
Schaftfräser ACL2 55°

Art. 47500

Fraise ACL2 55°
Fresa ACL2 55°
End mill ACL2 55°

N1–3

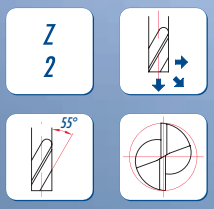
01

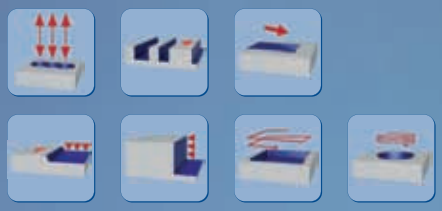


VHM MD/SC

SPHINX NORM

Z 2





Vc → S./p. 187

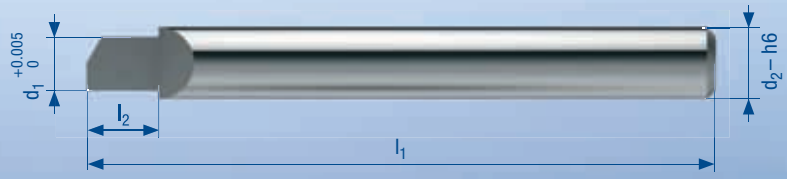
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
6.00	50.00	6.00	100	6.00
8.00	50.00	8.00	100	8.00
10.00	50.00	10.00	100	10.00
12.00	50.00	12.00	100	12.00
16.00	75.00	16.00	125	16.00
20.00	75.00	20.00	125	20.00

Gerade genuteter Fräser – 1 Zahn

Art. 47344

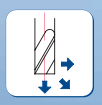
Fraise taille droite – 1 dent
Fresa taglio diritto – 1 dente
Straight fluted end mill – 1 tooth

N 5, 7, 8

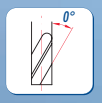


VHM MD/SC

SPHINX NORM



Z 1



Fläche poliert
Face polie miroir
Superficie lucidata
Surface polished

Vc → S./p. 172

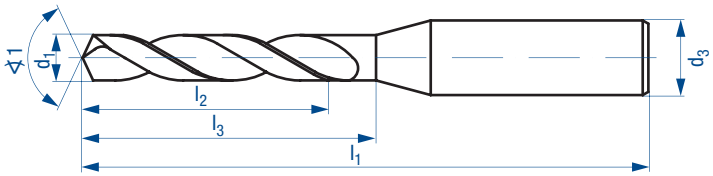
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.50	1.50	30	3.00
0.60	1.50	30	3.00
0.70	1.50	30	3.00
0.80	2.00	30	3.00
0.90	2.00	30	3.00
1.00	2.00	30	3.00
1.10	2.00	30	3.00
1.20	2.00	30	3.00
1.30	2.00	30	3.00
1.40	2.00	30	3.00
1.50	2.00	30	3.00
1.60	2.50	30	3.00
1.70	2.50	30	3.00
1.80	2.50	30	3.00
1.90	2.50	30	3.00
2.00	2.50	30	3.00
2.10	3.00	30	3.00
2.20	3.00	30	3.00
2.30	3.00	30	3.00
2.40	3.00	30	3.00
2.50	3.00	30	3.00
2.60	3.00	30	3.00
2.70	3.00	30	3.00
2.80	3.00	30	3.00
2.90	3.00	30	3.00
3.00	4.00	35	4.00
3.10	4.00	35	4.00
3.20	4.00	35	4.00
3.30	4.00	35	4.00
3.40	4.00	35	4.00
3.50	4.00	35	4.00
3.60	4.00	35	4.00
3.70	4.00	35	4.00
3.80	4.00	35	4.00
3.90	4.00	35	4.00
4.00	5.00	35	5.00
4.10	5.00	35	5.00
4.20	5.00	35	5.00

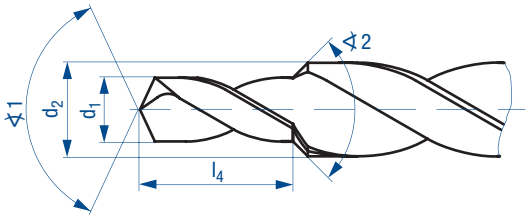
d_1 mm	l_2 mm	l_1 mm	d_2 mm
4.30	5.00	35	5.00
4.40	5.00	35	5.00
4.50	5.00	35	5.00
4.60	5.00	35	5.00
4.70	5.00	35	5.00
4.80	5.00	35	5.00
4.90	5.00	35	5.00
5.00	6.00	35	6.00
5.10	6.00	35	6.00
5.20	6.00	35	6.00
5.30	6.00	35	6.00
5.40	6.00	35	6.00
5.50	6.00	35	6.00
5.60	6.00	35	6.00
5.70	6.00	35	6.00
5.80	6.00	35	6.00
5.90	6.00	35	6.00
6.00	7.00	35	7.00
6.10	7.00	35	7.00
6.20	7.00	35	7.00
6.30	7.00	35	7.00
6.40	7.00	35	7.00
6.50	7.00	35	7.00
6.60	7.00	35	7.00
6.70	7.00	35	7.00
6.80	7.00	35	7.00
6.90	7.00	35	7.00
7.00	8.00	35	8.00
7.10	8.00	35	8.00
7.20	8.00	35	8.00
7.30	8.00	35	8.00
7.40	8.00	35	8.00
7.50	8.00	35	8.00
7.60	8.00	35	8.00
7.70	8.00	35	8.00
7.80	8.00	35	8.00
7.90	8.00	35	8.00


13
S1
30°
2
E2
Ø3
-0.2
-0.4
12.5
35°
25
1x45°

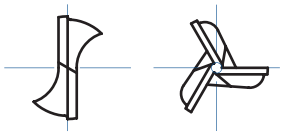
Inhaltsverzeichnis Sonderwerkzeuge
Table des matières outils spéciaux
Indice utensili speciali
Table of contents special tools

Microbohrer
Micro foret
Micro punta
Micro drill



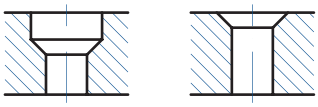


Schneidenanzahl:
No. of flutes:



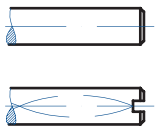
☐ ☐

Bohrungsart:
Type of hole:



☐ ☐

Kühlmittelzuführung:
Coolant:



☐
☐

d_1 = _____ Tol. = _____ ∢1 = _____ | l_1 = _____ l_3 = _____
d_2 = _____ Tol. = _____ ∢2 = _____ | l_2 = _____ l_4 = _____
d_3 = _____ Tol. = _____

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

_____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

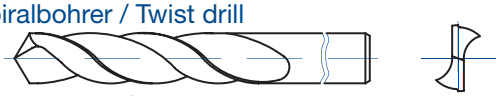
Fax _____

Datum/Unterschrift
Date/Signature _____

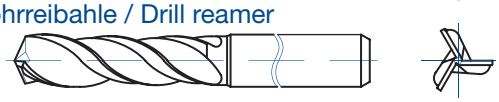
E-Mail _____

Stufenbohrer
Foret étagé
Punta a diametri multipli
Step drill

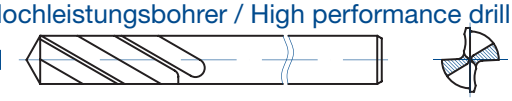
Spiralbohrer / Twist drill ☐

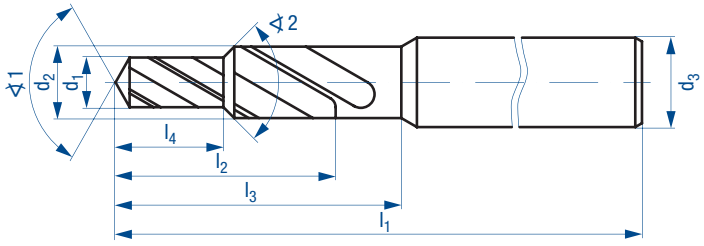


Bohrreibahle / Drill reamer ☐



Hochleistungsbohrer / High performance drill ☐



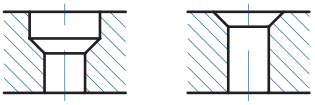


Form HA ☐ 
Form HAK ☐ 

Form HB ☐ 
Form HBK ☐ 

Form HE ☐ 
Form HEK ☐ 

Bohrungsart:
Type of hole:


☐ ☐

d_1 = _____ Tol. = _____ ∢1 = _____ l_1 = _____
d_2 = _____ Tol. = _____ ∢2 = _____ l_2 = _____
d_3 = _____ Tol. = _____ l_3 = _____
l_4 = _____

Kühlmittelzuführung: ☐ mit Innenkühlung ☐ ohne Innenkühlung
Coolant: ☐ with internal coolant ☐ without internal coolant

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

E-Mail _____

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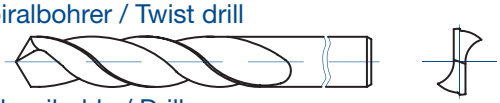
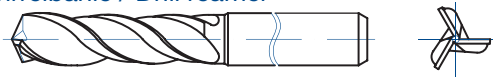
Stufenbohrer – 3 Stufen
Foret étagé – 3 étages
Punta a diametri multipli – 3 gradini
Step drill – 3 steps

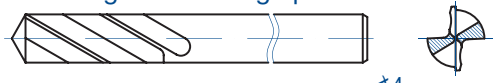
Spiralbohrer / Twist drill

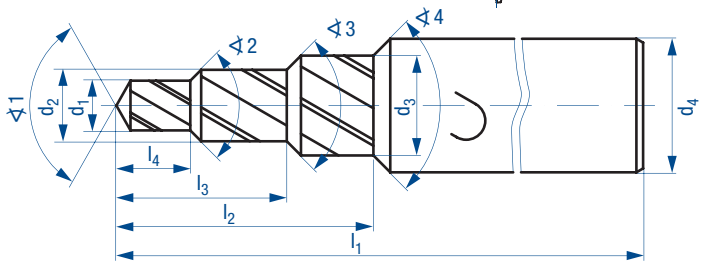
☐ 

Bohrreibahle / Drill reamer

☐ 

Hochleistungsbohrer / High performance drill

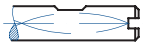
☐ 



Form HA ☐ 

Form HAK ☐ 

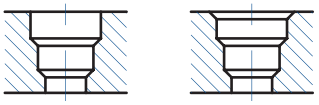
Form HB ☐ 

Form HBK ☐ 

Form HE ☐ 

Form HEK ☐ 

Bohrungsart:
Type of hole:



☐ ☐

d_1 =		Tol. =		∢1 =		l_1 =	
d_2 =		Tol. =		∢2 =		l_2 =	
d_3 =		Tol. =		∢3 =		l_3 =	
d_4 =		Tol. =		∢4 =		l_4 =	

Kühlmittelzuführung: ☐ mit Innenkühlung ☐ ohne Innenkühlung
Coolant: ☐ with internal coolant ☐ without internal coolant

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

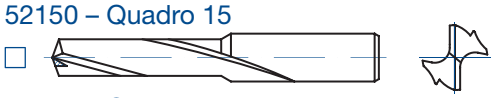
Fax _____

Datum/Unterschrift
Date/Signature _____

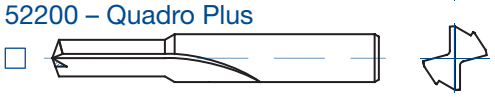
E-Mail _____

Quadro – Stufenbohrer
Quadro – Foret étagé
Quadro – Punta a diametri multipli
Quadro – Step drill

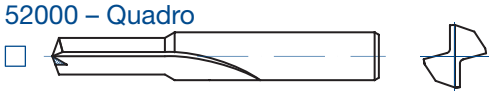
52150 – Quadro 15

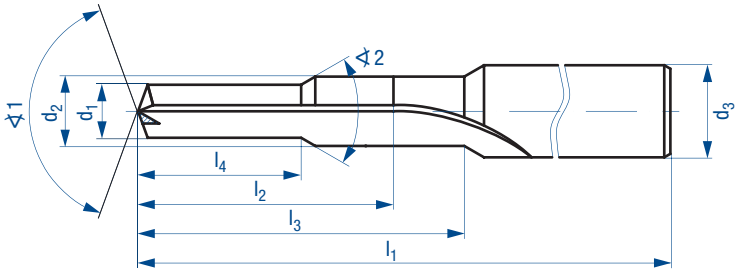


52200 – Quadro Plus

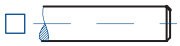


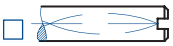
52000 – Quadro



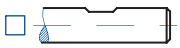


Form HA ☐ Form HAK ☐



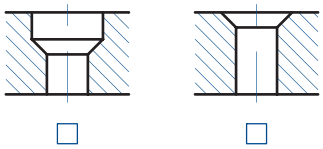


Form HB ☐ Form HBK ☐



Form HE ☐ Form HEK ☐

Bohrungsart:
Type of hole:



☐ ☐

d_1 = _____ Tol. = _____ ∢1 = _____ | l_1 = _____ l_3 = _____

d_2 = _____ Tol. = _____ ∢2 = _____ | l_2 = _____ l_4 = _____

d_3 = _____ Tol. = _____

Kühlmittelzuführung: ☐ mit Innenkühlung ☐ ohne Innenkühlung
Coolant: ☐ with internal coolant ☐ without internal coolant

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

E-Mail _____

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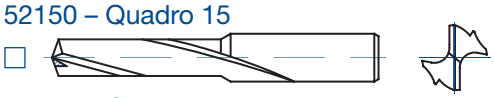
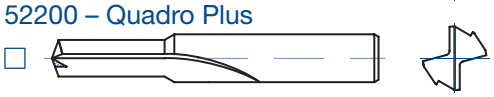
Quadro – Stufenbohrer – 3 Stufen
Quadro – Foret étagé – 3 étages
Quadro – Punta a diametri multipli – 3 gradini
Quadro – Step drill – 3 steps

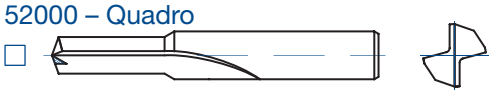
52150 – Quadro 15 ☐

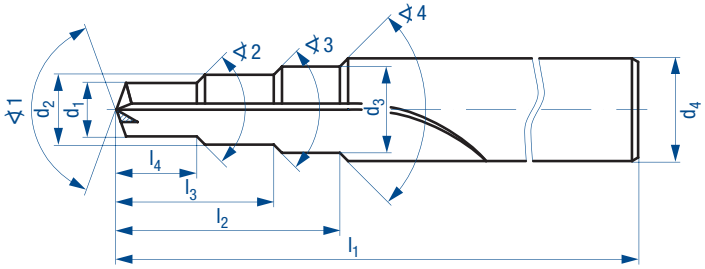


52200 – Quadro Plus ☐

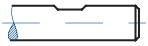
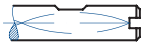


52000 – Quadro ☐



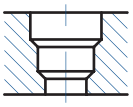


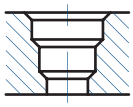
Form HA ☐ 
Form HAK ☐ 

Form HB ☐ 
Form HBK ☐ 

Form HE ☐ 
Form HEK ☐ 

Bohrungsart:
Type of hole:


☐


☐

d_1 =		Tol. =		∢1 =		l_1 =	
d_2 =		Tol. =		∢2 =		l_2 =	
d_3 =		Tol. =		∢3 =		l_3 =	
d_4 =		Tol. =		∢4 =		l_4 =	

Kühlmittelzuführung: ☐ mit Innenkühlung ☐ ohne Innenkühlung
Coolant: ☐ with internal coolant ☐ without internal coolant

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

E-Mail _____

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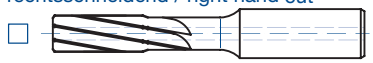
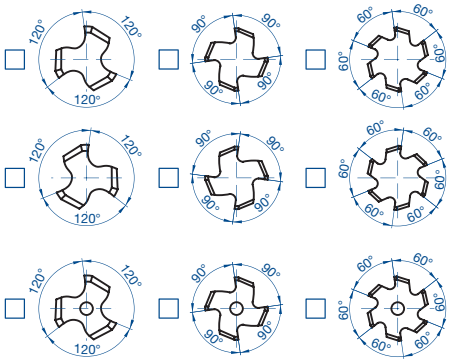
Reibahle
Alésoir
Alesatore
Reamer

58000
rechtsspiralisiert / right hand helix
rechtsschneidend / right hand cut

58500
linksspiralisiert / left hand helix
rechtsschneidend / right hand cut

mit IKZ / with internal coolant
rechtsspiralisiert / right hand helix
rechtsschneidend / right hand cut

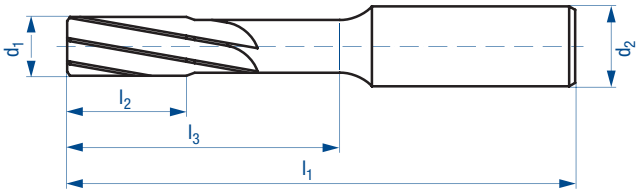




Sackloch/Blind hole

Durchgangsloch/Through hole

Sackloch/Blind hole



Form HA

Form HB

Form HE

d_1 = _____ Tol. = _____ | l_1 = _____ l_3 = _____

d_2 = _____ Tol. = _____ | l_2 = _____

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
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Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

E-Mail _____

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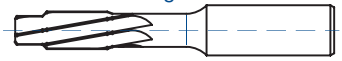
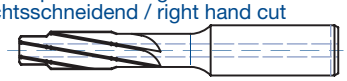
Stufenreibahle
Alésoir étagé
Alesatore a diametri multipli
Step reamer

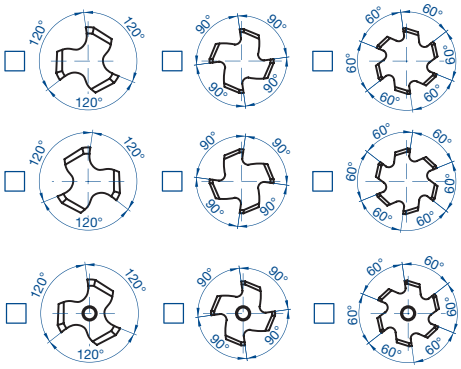
☐ rechtsspiralisiert / right hand helix
rechtsschneidend / right hand cut

☐ linksspiralisiert / left hand helix
rechtsschneidend / right hand cut



mit IKZ / with internal coolant
☐ rechtsspiralisiert / right hand helix
rechtsschneidend / right hand cut

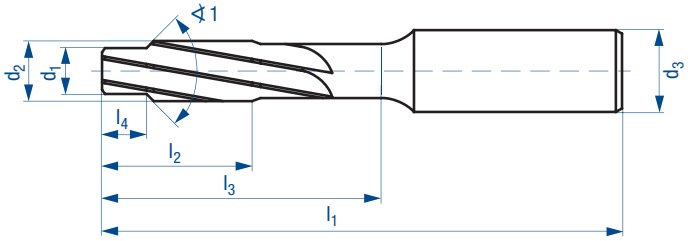




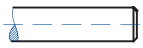
Sackloch/Blind hole

Durchgangsloch/Through hole

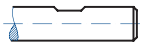
Sackloch/Blind hole



☐ Form HA



☐ Form HB



☐ Form HE

d_1 = _____ Tol. = _____ ∢1 = _____
d_2 = _____ Tol. = _____
d_3 = _____ Tol. = _____

l_1 = _____ l_3 = _____
l_2 = _____ l_4 = _____

Zu bearbeitender Werkstoff:
Material to be cut: _____

Schneidrichtung: ☐ rechts ☐ links
Direction of cutting: ☐ right hand ☐ left hand

Beschichtung: ☐ keine
Coating: _____ ☐ without

Stückzahl: ☐ Anfrage ☐ Bestellung
Quantity: _____ ☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
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Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

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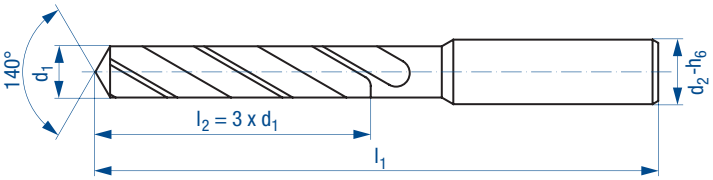
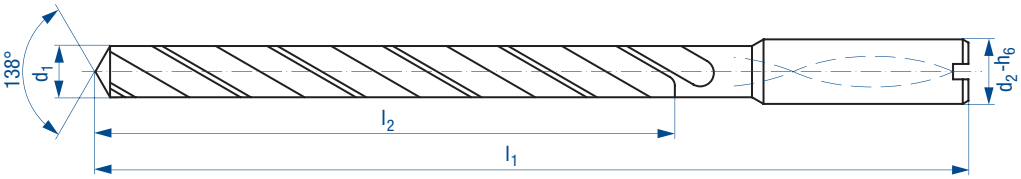
Pilotbohrer und Bohrer Extra-Long
Foret de préperçage et Foret Extra-Long
Punta per preforo e Punta Extra-Long
Pilot drill and Drill Extra-Long

Pilotbohrer
Pilot drill



Kühlmittelzuführung:
Coolant supply:

Bohrer Extra-Long
Drill Extra-Long



Pilotbohrer **Pilot drill**	**Bohrer Extra-Long** **Drill Extra-Long**
d_1 = _____	d_1 = _____ Tol. = _____
d_2 = _____	d_2 = _____
l_1 = _____	l_1 = _____
l_2 = $3 \times d_1$	l_2 = _____

Zu bearbeitender Werkstoff:
Material to be cut: _____

Stückzahl:
Quantity: _____

☐ Anfrage ☐ Bestellung
☐ Enquiry ☐ Order

Bemerkung:
Remarks: _____

_____

Firma
Company _____

Strasse/Nr.
Street/No. _____

Postleitzahl/Ort
ZIP-Code/City _____

Phone _____

Kontaktperson
Contact _____

Fax _____

Datum/Unterschrift
Date/Signature _____

E-Mail _____

Anwendungstechnik
Application de la technologie
Applicazione della tecnologia
Application technology

Erklärung Schnittdaten
Explication données de coupe
Spiegazione parametri di lavoro
Explication cutting data

Formel Schnittgeschwindigkeit v:
Formule vitesse de coupe v:
Formula velocità di taglio v:
Formula cutting speed v:

$$v = \frac{d \times \pi \times n}{1000}$$

Formel Drehzahl n:
Formule vitesse n:
Formula giri n:
Formula spindle speed n:

$$n = \frac{v \times 1000}{d \times \pi}$$

Bohrer, Reibahlen
Forets, alésoir
Punte, alesatore
Drill, reamer

Vc = Schnittgeschwindigkeit in m / min
Vitesse de coupe en m / min
Velocità di taglio in m / min
Cutting speed in m / min

Vf = Vorschubgeschwindigkeit mm / U
Avance en mm / t
Avanzamento in mm / g
Cutting feed in mm / rev

Fräser
Fraises
Frese
End mill

Vc = Schnittgeschwindigkeit in m / min
Vitesse de coupe en m / min
Velocità di taglio in m / min
Cutting speed in m / min

fz = Vorschubgeschwindigkeit in mm / Zahn
Avance en mm / dent
Avanzamento in mm / tagliente
Cutting speed in mm / tooth

Vf = Vorschubgeschwindigkeit mm / U = $fz \times Z \times n$
Avance en mm / t = $fz \times d \times n$
Avanzamento in mm / g = $fz \times d \times n$
Cutting speed in mm / rev = $fz \times t \times n$

ap = Schnitttiefe
Profondeur de coupe
Profondità di taglio
Cutting depth

ae = Schnittbreite
Largeur de coupe
Larghezza di taglio
Cutting width

Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

50806 / 50809

Mat.		ø 0.50–1.00	ø 1.10–2.90	ø 3.00–6.00
P1	v_c	15–25	25–40	25–40
	f_z	0.020–0.080	0.060–0.140	0.120–0.250
P2	v_c	12–20	20–35	20–35
	f_z	0.010–0.060	0.040–0.120	0.100–0.220
P3	v_c	8–18	12–30	12–30
	f_z	0.010–0.040	0.030–0.090	0.080–0.200
M1	v_c	6–12	10–20	10–20
	f_z	0.020–0.050	0.030–0.070	0.050–0.150
M2	v_c	5–10	8–16	8–16
	f_z	0.010–0.040	0.030–0.060	0.040–0.080
K1	v_c	15–25	25–40	25–40
	f_z	0.010–0.050	0.030–0.080	0.070–0.150
K2	v_c	12–20	20–35	20–35
	f_z	0.010–0.040	0.030–0.060	0.050–0.100
N1	v_c	30–45	45–60	45–60
	f_z	0.030–0.080	0.060–0.120	0.100–0.250
N2	v_c	20–35	30–45	30–45
	f_z	0.040–0.080	0.070–0.150	0.130–0.300
N3	v_c	15–30	25–40	25–40
	f_z	0.020–0.070	0.060–0.120	0.100–0.250
N4	v_c	15–25	25–40	25–40
	f_z	0.010–0.050	0.030–0.08	0.060–0.150
N5	v_c	30–45	45–60	45–60
	f_z	0.040–0.080	0.070–0.130	0.100–0.250
N6	v_c	15–30	25–40	25–40
	f_z	0.010–0.040	0.038–0.065	0.060–0.090
N7	v_c	15–25	25–40	25–40
	f_z	0.010–0.040	0.030–0.080	0.050–0.130
N8	v_c	8–18	12–30	12–30
	f_z	0.010–0.040	0.020–0.050	0.030–0.100
S1	v_c	20–35	30–45	30–45
	f_z	0.010–0.040	0.020–0.0560	0.040–0.100
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	20–35	30–45	30–45
	f_z	0.020–0.060	0.050–0.120	0.100–0.250
O2	v_c			
	f_z			
O3	v_c			
	f_z			

56005

Mat.		ø 0.10–0.30	ø 0.35–0.80	ø 0.85–1.50
P1	v_c	8–18	15–30	30–60
	f_z	0.001–0.003	0.002–0.010	0.010–0.020
P2	v_c	6–16	12–25	20–40
	f_z	0.001–0.002	0.002–0.008	0.006–0.015
P3	v_c	6–13	10–20	18–35
	f_z	0.001–0.002	0.002–0.005	0.004–0.012
M1	v_c	5–12	10–18	15–30
	f_z	0.001–0.002	0.002–0.005	0.004–0.010
M2	v_c	5–10	8–15	13–25
	f_z	0.001–0.002	0.002–0.004	0.003–0.009
K1	v_c	8–18	15–30	30–60
	f_z	0.003–0.008	0.006–0.010	0.008–0.025
K2	v_c	6–16	12–25	20–40
	f_z	0.002–0.004	0.005–0.008	0.007–0.020
N1	v_c	12–20	18–35	35–65
	f_z	0.001–0.004	0.003–0.008	0.006–0.015
N2	v_c	10–18	15–30	25–50
	f_z	0.002–0.005	0.004–0.010	0.008–0.025
N3	v_c	8–18	15–30	30–60
	f_z	0.002–0.005	0.004–0.008	0.006–0.020
N4	v_c	8–18	15–30	30–60
	f_z	0.001–0.004	0.003–0.006	0.005–0.015
N5	v_c	12–20	18–35	35–65
	f_z	0.002–0.005	0.004–0.010	0.009–0.025
N6	v_c	8–18	15–30	30–60
	f_z	0.002–0.005	0.004–0.008	0.007–0.020
N7	v_c	8–18	15–30	30–60
	f_z	0.002–0.005	0.004–0.008	0.007–0.020
N8	v_c	6–13	10–20	18–35
	f_z	0.001–0.004	0.002–0.007	0.005–0.015
S1	v_c	15–30	28–45	30–45
	f_z	0.002–0.006	0.005–0.010	0.008–0.020
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	8–18	15–30	30–60
	f_z	0.005–0.010	0.008–0.015	0.013–0.035
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Genannte Werte sind Richtwerte, die je nach Maschine, Aufspannung, Kühlschmierstoff usw. noch angepasst werden müssen.
Les valeurs mentionnées sont des valeurs recommandées qui doivent être adaptées selon les conditions de la machine, du serrage, du lubrifiant etc.
Questi valori sono valori raccomandati che devono essere adattati secondo le condizioni della macchina, del serraggio, del lubrificante etc.
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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 56030 / 56033

Mat.		ø 0.03–0.10	ø 0.11–0.50	ø 0.51–0.80	ø 0.81–1.50	ø 1.51–2.00
P1	v_c	1.5–5	4–10	10–30	30–60	30–60
	f_z	0.001–0.003	0.002–0.010	0.008–0.0015	0.012–0.025	0.020–0.035
P2	v_c	1.2–4	3.5–8	8–25	25–50	25–50
	f_z	0.001–0.002	0.002–0.008	0.007–0.013	0.010–0.022	0.018–0.032
P3	v_c	1–3	3–6	6–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.007	0.006–0.012	0.009–0.020	0.016–0.030
M1	v_c	1.2–4	3.5–8	8–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.007	0.005–0.010	0.008–0.018	0.016–0.025
M2	v_c	1–3	3–6	5–15	15–30	15–30
	f_z	0.001–0.002	0.002–0.005	0.005–0.008	0.007–0.015	0.013–0.020
K1	v_c	1.5–5	4–10	10–30	30–60	30–60
	f_z	0.001–0.004	0.003–0.008	0.006–0.012	0.010–0.022	0.018–0.035
K2	v_c	1.2–4	3.5–8	8–25	25–50	25–50
	f_z	0.001–0.003	0.002–0.007	0.005–0.011	0.009–0.020	0.016–0.030
N1	v_c	2–6	5–15	15–40	40–70	40–70
	f_z	0.001–0.003	0.002–0.006	0.005–0.010	0.008–0.018	0.015–0.028
N2	v_c	1.8–5.5	5–15	15–40	40–65	40–65
	f_z	0.001–0.003	0.002–0.007	0.006–0.012	0.011–0.020	0.018–0.030
N3	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.002	0.002–0.006	0.005–0.010	0.009–0.018	0.016–0.025
N4	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.015	0.013–0.020
N5	v_c	2–6	5–15	15–35	35–65	35–65
	f_z	0.001–0.003	0.002–0.006	0.005–0.010	0.009–0.018	0.016–0.025
N6	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.003	0.002–0.005	0.004–0.009	0.008–0.015	0.013–0.018
N7	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.002	0.002–0.004	0.003–0.008	0.006–0.013	0.012–0.020
N8	v_c	1–3	3–6	6–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.004	0.006–0.006	0.005–0.011	0.010–0.016
S1	v_c	0.8–5	4–7	7–15	15–30	15–30
	f_z	0.001–0.002	0.002–0.004	0.003–0.008	0.007–0.015	0.013–0.020
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	1.5–5	4–10	10–25	20–35	30–60
	f_z	0.001–0.003	0.003–0.008	0.007–0.015	0.013–0.025	0.022–0.040
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 56036

Mat.		ø 0.40–0.90	ø 1.00–1.90	ø 2.00–3.00
P1	v_c	40–80	80–130	80–130
	f_z	0.020–0.050	0.050–0.090	0.090–0.150
P2	v_c	35–75	70–100	70–100
	f_z	0.015–0.040	0.040–0.080	0.080–0.140
P3	v_c	35–50	50–90	50–90
	f_z	0.010–0.020	0.020–0.060	0.060–0.100
M1	v_c	30–40	40–80	40–80
	f_z	0.005–0.008	0.008–0.040	0.040–0.080
M2	v_c	20–30	30–70	30–70
	f_z	0.005–0.008	0.008–0.040	0.040–0.080
K1	v_c	50–100	100–150	100–150
	f_z	0.020–0.050	0.040–0.100	0.100–0.150
K2	v_c	40–80	80–130	80–130
	f_z	0.015–0.040	0.040–0.080	0.080–0.120
N1	v_c	60–90	90–140	90–140
	f_z	0.020–0.040	0.030–0.070	0.070–0.120
N2	v_c	60–120	120–150	120–150
	f_z	0.020–0.040	0.040–0.090	0.090–0.150
N3	v_c	60–120	120–150	120–150
	f_z	0.020–0.040	0.040–0.090	0.090–0.150
N4	v_c	40–70	70–100	70–100
	f_z	0.018–0.035	0.035–0.070	0.070–0.120
N5	v_c	60–120	120–150	120–150
	f_z	0.025–0.050	0.050–0.100	0.100–0.200
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c	30–40	40–80	40–80
	f_z	0.015–0.030	0.025–0.080	0.070–0.120
S2	v_c			
	f_z			
H1	v_c	15–25	20–35	20–35
	f_z	0.005–0.015	0.015–0.030	0.030–0.050
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Genannte Werte sind Richtwerte, die je nach Maschine, Aufspannung, Kühlschmierstoff usw. noch angepasst werden müssen.
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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 16004

Mat.		ø 0.10–0.30	ø 0.35–0.50	ø 0.55–0.80	ø 0.85–1.50
P1	v_c	1.0–2.0	2.0–5.5	3.5–11	9.0–15
	f_z	0.001–0.005	0.004–0.007	0.006–0.011	0.010–0.015
P2	v_c	0.8–1.5	1.2–4.0	3.5–8.0	7.0–12
	f_z	0.001–0.003	0.002–0.006	0.005–0.007	0.006–0.010
P3	v_c	0.5–1.2	1.0–3.5	2.0–5.0	3.0–7.5
	f_z	0.001–0.002	0.002–0.004	0.003–0.006	0.005–0.010
M1	v_c	0.8–1.5	1.2–4.0	3.5–8.0	7.0–12
	f_z	0.001–0.002	0.002–0.004	0.003–0.006	0.005–0.010
M2	v_c	0.5–1.2	1.0–3.5	2.0–5.0	3.0–7.5
	f_z	0.001–0.002	0.002–0.004	0.003–0.005	0.004–0.008
K1	v_c	1.0–2.0	2.0–5.5	3.5–11	9.0–15
	f_z	0.001–0.005	0.004–0.008	0.007–0.011	0.010–0.015
K2	v_c	0.8–1.5	1.2–4.0	3.5–8.0	7.0–12
	f_z	0.001–0.003	0.002–0.006	0.005–0.007	0.006–0.010
N1	v_c	1.0–2.0	2.0–5.5	3.5–11	9.0–15
	f_z	0.001–0.006	0.005–0.010	0.008–0.015	0.013–0.025
N2	v_c	0.8–1.5	1.2–4.0	3.5–8.0	7.0–12
	f_z	0.002–0.006	0.005–0.010	0.008–0.015	0.013–0.025
N3	v_c				
	f_z				
N4	v_c				
	f_z				
N5	v_c	1.0–2.0	2.0–5.5	3.5–11	9.0–15
	f_z	0.002–0.006	0.005–0.010	0.008–0.015	0.013–0.020
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c				
	f_z				
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 50695 / 50699

Mat.		ø 0.05–0.30	ø 0.31–0.50	ø 0.51–0.80	ø 0.81 + 1.20	ø 1.21–2.00
P1	v_c	1.0–6.0	6.0–15	10–23	23–60	23–60
	f_z	0.001–0.004	0.003–0.008	0.007–0.013	0.012–0.018	0.016–0.025
P2	v_c	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f_z	0.001–0.003	0.002–0.007	0.006–0.012	0.010–0.016	0.014–0.022
P3	v_c	0.5–5.0	1.0–8.0	2.5–13	5.0–25	5.0–25
	f_z	0.001–0.002	0.002–0.006	0.005–0.010	0.008–0.014	0.012–0.020
M1	v_c	0.5–3.0	1.0–6.0	4.0–10	8.0–18	8.0–18
	f_z	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.012	0.010–0.016
M2	v_c					
	f_z					
K1	v_c	2.0–8.0	6.0–15	10–23	23–60	23–60
	f_z	0.001–0.004	0.003–0.008	0.007–0.013	0.012–0.018	0.016–0.025
K2	v_c	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f_z	0.001–0.003	0.002–0.007	0.006–0.012	0.010–0.016	0.014–0.022
N1	v_c					
	f_z					
N2	v_c	3.0–16	8.0–26	13–55	30–100	30–100
	f_z	0.001–0.004	0.004–0.007	0.007–0.011	0.010–0.016	0.015–0.022
N3	v_c	2.5–13	6.0–22	10–40	20–80	20–80
	f_z	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N4	v_c	2.0–8.0	6.0–15	10–23	23–60	23–60
	f_z	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.017	0.010–0.016
N5	v_c	3.0–16	8.0–26	13–55	30–100	30–100
	f_z	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N6	v_c					
	f_z					
N7	v_c	2.0–8.0	6.0–15	10–23	23–60	23–60
	f_z	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N8	v_c	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f_z	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.010	0.008–0.013
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Les valeurs mentionnées sont des valeurs recommandées qui doivent être adaptées selon les conditions de la machine, du serrage, du lubrifiant etc.
Questi valori sono valori raccomandati che devono essere adattati secondo le condizioni della macchina, del serraggio, del lubrificante etc.
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Art. 51200

Mat.		ø 0.03–0.30	ø 0.31–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–3.00
P1	v_c	1.5–5	4–10	10–30	30–60	30–60
	f_z	0.001–0.004	0.003–0.008	0.007–0.015	0.014–0.025	0.023–0.035
P2	v_c	1.2–4	3.5–8	8–25	25–50	25–50
	f_z	0.001–0.003	0.002–0.007	0.006–0.014	0.012–0.023	0.021–0.032
P3	v_c	1–3	3–6	6–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.006	0.005–0.013	0.011–0.020	0.018–0.030
M1	v_c	1.2–4	3.5–8	8–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.005	0.004–0.011	0.010–0.018	0.016–0.028
M2	v_c	1–3	3–6	5–15	15–30	15–30
	f_z	0.001–0.002	0.002–0.004	0.003–0.009	0.008–0.016	0.016–0.028
K1	v_c	1.5–5	4–10	10–30	30–60	30–60
	f_z	0.001–0.004	0.003–0.008	0.007–0.015	0.014–0.025	0.023–0.035
K2	v_c	1.2–4	3.5–8	8–25	25–50	25–50
	f_z	0.001–0.003	0.002–0.007	0.006–0.014	0.012–0.022	0.020–0.032
N1	v_c	2–6	5–15	15–40	40–70	40–70
	f_z	0.001–0.003	0.002–0.006	0.005–0.013	0.012–0.020	0.018–0.030
N2	v_c	1.8–5.5	5.0–15	15–40	40–65	40–65
	f_z	0.001–0.004	0.003–0.007	0.006–0.015	0.014–0.022	0.020–0.035
N3	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.004	0.003–0.006	0.006–0.013	0.012–0.020	0.018–0.032
N4	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.002	0.002–0.005	0.004–0.010	0.009–0.016	0.015–0.025
N5	v_c	2–6	5–15	15–35	35–65	35–65
	f_z	0.001–0.004	0.003–0.006	0.005–0.013	0.012–0.020	0.018–0.032
N6	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.002	0.002–0.005	0.004–0.010	0.009–0.016	0.015–0.020
N7	v_c	1.5–5	4–12	12–30	30–60	30–60
	f_z	0.001–0.004	0.003–0.006	0.005–0.012	0.011–0.018	0.016–0.025
N8	v_c	1–3	2.5–6	6–20	20–45	20–45
	f_z	0.001–0.002	0.002–0.005	0.004–0.009	0.008–0.013	0.012–0.018
S1	v_c	0.8–5	4–7	7–15	15–30	15–30
	f_z	0.001–0.003	0.002–0.006	0.005–0.013	0.012–0.020	0.018–0.030
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	1.5–5	4–10	10–25	20–35	30–60
	f_z	0.001–0.004	0.003–0.010	0.009–0.018	0.016–0.028	0.026–0.040
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 51201

Mat.		ø 0.30–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–3.00
P1	v_c	5–12	12–35	35–65	35–60
	f_z	0.003–0.008	0.007–0.015	0.014–0.025	0.023–0.035
P2	v_c	4–9	9–28	28–55	28–55
	f_z	0.002–0.007	0.006–0.014	0.012–0.023	0.021–0.032
P3	v_c	3.3–7	7–23	23–50	23–50
	f_z	0.002–0.006	0.005–0.013	0.011–0.020	0.018–0.030
M1	v_c	4–9	9–28	28–55	28–55
	f_z	0.002–0.005	0.004–0.011	0.010–0.018	0.016–0.028
M2	v_c	3–8	8–20	18–35	18–35
	f_z	0.002–0.004	0.003–0.009	0.008–0.016	0.016–0.028
K1	v_c	5–12	12–35	35–65	35–60
	f_z	0.003–0.008	0.007–0.015	0.014–0.025	0.023–0.035
K2	v_c	4–10	10–30	30–55	30–50
	f_z	0.002–0.007	0.006–0.014	0.012–0.022	0.020–0.032
N1	v_c	6–19	19–45	45–80	45–80
	f_z	0.002–0.006	0.005–0.013	0.012–0.020	0.018–0.030
N2	v_c	5.5–17	17–45	45–70	45–70
	f_z	0.003–0.007	0.006–0.015	0.014–0.022	0.020–0.035
N3	v_c	5.5–15	15–35	35–65	35–65
	f_z	0.003–0.006	0.006–0.013	0.012–0.020	0.018–0.032
N4	v_c	5.5–15	15–35	35–65	35–65
	f_z	0.002–0.005	0.004–0.010	0.009–0.016	0.015–0.025
N5	v_c	6.5–18	18–40	40–70	40–70
	f_z	0.003–0.006	0.005–0.013	0.012–0.020	0.018–0.032
N6	v_c	5.5–15	15–35	35–65	35–65
	f_z	0.002–0.005	0.004–0.010	0.009–0.016	0.015–0.020
N7	v_c	5.5–15	15–35	35–65	35–65
	f_z	0.003–0.006	0.005–0.012	0.011–0.018	0.016–0.025
N8	v_c	3–7	7–23	23–50	23–50
	f_z	0.002–0.005	0.004–0.009	0.008–0.013	0.012–0.018
S1	v_c	5–8	8.0–18	18–35	18–35
	f_z	0.002–0.006	0.005–0.013	0.012–0.020	0.018–0.030
S2	v_c	2.5–7	6–12	11–20	11–20
	f_z	0.002–0.004	0.003–0.007	0.006–0.011	0.010–0.018
H1	v_c	2.5–7	6–12	11–20	11–20
	f_z	0.002–0.004	0.003–0.007	0.006–0.011	0.010–0.018
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c	5–12	12–35	35–65	35–60
	f_z	0.003–0.010	0.009–0.018	0.016–0.028	0.026–0.040
O2	v_c	2.5–6	6–20	20–45	20–45
	f_z	0.002–0.009	0.008–0.016	0.015–0.025	0.022–0.035
O3	v_c				
	f_z				

Genannte Werte sind Richtwerte, die je nach Maschine, Aufspannung, Kühlschmierstoff usw. noch angepasst werden müssen.
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Art. 50620 / 50621

Mat.		ø 0.20–0.50	ø 0.51–1.00	ø 1.01–2.00
P1	v_c	6–15	15–35	15–35
	f_z	0.001–0.007	0.006–0.012	0.011–0.021
P2	v_c	5–13	13–30	13–30
	f_z	0.001–0.005	0.004–0.008	0.007–0.012
P3	v_c	4–10	10–25	10–25
	f_z	0.001–0.004	0.003–0.007	0.006–0.010
M1	v_c	4–10	10–25	10–25
	f_z	0.001–0.004	0.003–0.007	0.006–0.010
M2	v_c			
	f_z			
K1	v_c	6–15	15–35	15–35
	f_z	0.001–0.007	0.006–0.012	0.011–0.021
K2	v_c	5–13	13–30	13–30
	f_z	0.001–0.005	0.004–0.008	0.007–0.012
N1	v_c			
	f_z			
N2	v_c	8–20	20–50	20–50
	f_z	0.001–0.007	0.006–0.012	0.011–0.022
N3	v_c	6.5–18	18–45	18–45
	f_z	0.001–0.007	0.006–0.011	0.010–0.020
N4	v_c			
	f_z			
N5	v_c	6.5–18	18–45	18–45
	f_z	0.001–0.008	0.007–0.014	0.013–0.025
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 50622

Mat.		ø 0.20–0.50	ø 0.51–1.00	ø 1.01–2.00
P1	v_c	6.5–17	17–40	17–40
	f_z	0.001–0.007	0.006–0.012	0.011–0.021
P2	v_c	6–15	15–35	15–35
	f_z	0.001–0.005	0.004–0.008	0.007–0.012
P3	v_c	5–13	13–28	13–28
	f_z	0.001–0.004	0.003–0.007	0.006–0.010
M1	v_c	5–13	13–28	13–28
	f_z	0.001–0.004	0.003–0.007	0.006–0.010
M2	v_c			
	f_z			
K1	v_c	6.5–17	17–40	17–40
	f_z	0.001–0.007	0.006–0.012	0.011–0.021
K2	v_c	6–15	15–35	15–35
	f_z	0.001–0.005	0.004–0.008	0.007–0.012
N1	v_c			
	f_z			
N2	v_c	9–25	25–55	25–55
	f_z	0.001–0.007	0.006–0.012	0.011–0.022
N3	v_c	8–22	22–50	22–50
	f_z	0.001–0.007	0.006–0.011	0.010–0.020
N4	v_c			
	f_z			
N5	v_c	8–22	22–50	22–50
	f_z	0.001–0.008	0.007–0.014	0.013–0.025
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c	2–5	5–12	5–12
	f_z	0.001–0.004	0.003–0.010	0.009–0.020
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 50941

Mat.		ø 0.50–0.90	ø 1.00–1.60	ø 1.70–2.40
P1	v_c	40–80	80–130	80–130
	f_z	0.020–0.050	0.050–0.090	0.090–0.150
P2	v_c	35–75	70–100	70–100
	f_z	0.015–0.040	0.040–0.080	0.080–0.140
P3	v_c	30–50	50–90	50–90
	f_z	0.010–0.020	0.020–0.060	0.060–0.100
M1	v_c	30–40	40–80	40–80
	f_z	0.005–0.008	0.008–0.040	0.040–0.080
M2	v_c	20–30	30–70	30–70
	f_z	0.005–0.008	0.008–0.060	0.060–0.100
K1	v_c	50–100	100–150	100–150
	f_z	0.020–0.050	0.050–0.100	0.100–0.150
K2	v_c	40–80	80–130	80–130
	f_z	0.015–0.040	0.040–0.080	0.080–0.120
N1	v_c			
	f_z			
N2	v_c	60–120	120–150	120–150
	f_z	0.020–0.040	0.040–0.090	0.090–0.150
N3	v_c	60–120	120–180	120–180
	f_z	0.020–0.040	0.040–0.090	0.090–0.150
N4	v_c			
	f_z			
N5	v_c			
	f_z			
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c	20–30	30–60	30–60
	f_z	0.003–0.005	0.005–0.015	0.012–0.030
S2	v_c			
	f_z			
H1	v_c	10–20	15–30	15–30
	f_z	0.002–0.004	0.003–0.012	0.010–0.015
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 55652

Mat.		ø 0.20–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–2.99
P1	v_c	10–25	25–40	40–60	40–60
	f_z	0.005–0.008	0.007–0.015	0.013–0.040	0.035–0.050
P2	v_c	8.0–20	20–30	30–50	30–50
	f_z	0.004–0.007	0.006–0.015	0.013–0.035	0.030–0.045
P3	v_c				
	f_z				
M1	v_c	8–15	15–25	25–40	25–40
	f_z	0.003–0.006	0.005–0.012	0.010–0.020	0.018–0.030
M2	v_c				
	f_z				
K1	v_c	20–45	45–60	60–100	60–100
	f_z	0.004–0.008	0.007–0.015	0.013–0.040	0.035–0.050
K2	v_c	15–30	30–40	40–80	40–80
	f_z	0.002–0.006	0.005–0.013	0.011–0.032	0.030–0.045
N1	v_c				
	f_z				
N2	v_c	20–50	50–80	80–120	80–120
	f_z	0.005–0.010	0.008–0.020	0.018–0.050	0.040–0.080
N3	v_c	20–40	30–70	60–100	60–100
	f_z				
N4	v_c				
	f_z				
N5	v_c				
	f_z				
N6	v_c	20–40	30–70	60–100	60–100
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	10–20	20–30	30–50	30–50
	f_z	0.002–0.005	0.004–0.010	0.008–0.030	0.028–0.040
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c	8.0–20	20–30	30–50	30–50
	f_z	0.004–0.007	0.006–0.015	0.013–0.035	0.030–0.045
O2	v_c				
	f_z				
O3	v_c				
	f_z				

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Art. 12604

Mat.		ø 0.05–0.30	ø 0.31–0.80	ø 0.81-1.50	ø 1.55–3.17
P1	v_c	1.0–2.0	2.0–8.0	8.0–20	8.0–20
	f_z	0.001–0.005	0.005–0.011	0.010–0.015	0.014–0.021
P2	v_c	0.5–1.5	1.5–7.0	7.0–16	7.0–16
	f_z	0.001–0.002	0.002–0.006	0.005–0.009	0.008–0.012
P3	v_c				
	f_z				
M1	v_c	0.5–1.5	1.5–7.0	7.0 -16	7.0–16
	f_z	0.001–0.002	0.002–0.006	0.005–0.009	0.008–0.015
M2	v_c	0.5–1.2	1.2–6.0	6.0–15	6.0–15
	f_z	0.001–0.002	0.002–0.005	0.004–0.007	0.006–0.012
K1	v_c	1.0–5.0	5.0–10	10–20	10–20
	f_z	0.001–0.005	0.004–0.011	0.010–0.015	0.014–0.020
K2	v_c	0.8–4.0	4.0–8.0	8.0–18	8.0–18
	f_z	0.001–0.004	0.003–0.008	0.007–0.011	0.010–0.016
N1	v_c	2.0–7.0	7.0–13	13–25	13–25
	f_z	0.001–0.004	0.003–0.010	0.009–0.016	0.015–0.022
N2	v_c	1.5–6.0	6.0–12	12–22	12–22
	f_z	0.001–0.005	0.004–0.011	0.010–0.020	0.018–0.035
N3	v_c				
	f_z				
N4	v_c				
	f_z				
N5	v_c	2.0–7.0	7.0–13	13–25	13–25
	f_z	0.001–0.004	0.003–0.010	0.009–0.018	0.017–0.030
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c				
	f_z				
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 11654

Mat.		ø 0.50–1.00	ø 1.050–1.70	ø 1.70–2.30
P1	v_c	2.0–8.0	8.0–20	8.0–20
	f_z	0.006–0.012	0.011–0.019	0.018–0.026
P2	v_c	1.5–7.0	7.0–16	7.0–16
	f_z	0.005–0.010	0.009–0.016	0.015–0.022
P3	v_c			
	f_z			
M1	v_c			
	f_z			
M2	v_c			
	f_z			
K1	v_c	5.0–10	10–20	10–20
	f_z	0.006–0.012	0.011–0.019	0.018–0.025
K2	v_c	4.0–8.0	8.0–18	8.0–18
	f_z	0.004–0.010	0.009–0.017	0.015–0.022
N1	v_c			
	f_z			
N2	v_c			
	f_z			
N3	v_c			
	f_z			
N4	v_c			
	f_z			
N5	v_c	7.0–13	13–25	13–25
	f_z	0.006–0.012	0.011–0.020	0.018–0.035
N6	v_c			
	f_z			
N7	v_c	2.0–8.0	8.0–20	8.0–20
	f_z	0.006–0.012	0.011–0.019	0.018–0.030
N8	v_c	1.5–7.0	7.0–16	7.0–16
	f_z	0.003–0.008	0.007–0.013	0.012–0.018
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 70030 – 70090 / 70130 – 70190

Mat.				
P1	v_c	180–280		
	f_z	80–180	mm/min	
P2	v_c	180–280		
	f_z	70–160	mm/min	
P3	v_c	180–280		
	f_z	70–150	mm/min	
M1	v_c	180–280		
	f_z	70–150	mm/min	
M2	v_c	180–280		
	f_z	70–150	mm/min	
K1	v_c	180–280		
	f_z	80–180	mm/min	
K2	v_c	180–280		
	f_z	70–160	mm/min	
N1	v_c	180–280		
	f_z	60–140	mm/min	
N2	v_c	180–280		
	f_z	80–180	mm/min	
N3	v_c	180–280		
	f_z	70–160	mm/min	
N4	v_c	180–280		
	f_z	60–120	mm/min	
N5	v_c	180–280		
	f_z	80–200	mm/min	
N6	v_c	180–280		
	f_z	60–150	mm/min	
N7	v_c	180–280		
	f_z	80–200	mm/min	
N8	v_c	180–280		
	f_z	80–200	mm/min	
S1	v_c	180–280		
	f_z	50–120	mm/min	
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	180–280		
	f_z	80–200	mm/min	
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 72075 / 72150

Mat.		ø 0.10–0.30	ø 0.40–1.50	ø 1.50–3.0	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.5×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.3×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.001–0.004	0.003–0.20	0.015–0.035	1×d1	0.2×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.4×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.001–0.004	0.003–0.016	0.014–0.028	1×d1	0.25×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	1×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.4×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	1×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.9×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.9×d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	1×d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.5×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.001–0.003	0.002–0.015	0.012–0.030	1×d1	0.4×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	80–120	80–120	80–120		
	f_z	0.001–0.006	0.005–0.025	0.020–0.045	1×d1	1×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 42000

Mat.		ø 0.10–0.30	ø 0.40–1.50	ø 1.50–3.0	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.5×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.3×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.001–0.004	0.003–0.20	0.015–0.035	1×d1	0.2×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.4×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.001–0.004	0.003–0.016	0.014–0.028	1×d1	0.25×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	1×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.4×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	1×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.9×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	0.9×d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	1×d1	1×d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	1×d1	0.5×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.001–0.003	0.002–0.015	0.012–0.030	1×d1	0.4×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	80–120	80–120	80–120		
	f_z	0.001–0.006	0.005–0.025	0.020–0.045	1×d1	1×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 72500/72800

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.50	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.45×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.25×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	1×d1	0.15×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.35×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	1×d1	0.2×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.8×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.35×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	1×d1	0.8×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.7×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.7×d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.8×d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.45×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.003–0.008	0.006–0.015	0.012–0.030	1×d1	0.3×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	80–120	80–120	80–120		
	f_z	0.006–0.012	0.010–0.025	0.020–0.045	1×d1	0.9×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 73130 / 73200 / 73300

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.90	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.9×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.8×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	1×d1	0.7×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.6×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	1×d1	0.5×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	1.0×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.9×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	1×d1	0.9×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.9×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	0.9×d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1×d1	1×d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.8×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.003–0.008	0.006–0.015	0.012–0.030	1×d1	0.7×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 43105

Mat.		ø 0.30–0.70	ø 0.80–1.50	ø 1.60–3.00	a_e	a_p
P1	v_c	80–120	80–120	80–120		
	f_z	0.002–0.005	0.003–0.015	0.005–0.03	1×d1	0.8×d1
P2	v_c	70–100	70–100	70–100		
	f_z	0.001–0.004	0.003–0.012	0.005–0.025	1×d1	0.6×d1
P3	v_c	40–70	40–70	40–70		
	f_z	0.001–0.003	0.002–0.012	0.003–0.018	1×d1	0.5×d1
M1	v_c	60–90	60–90	60–90		
	f_z	0.001–0.003	0.002–0.012	0.003–0.016	1×d1	0.5×d1
M2	v_c	30–60	30–60	30–60		
	f_z	0.001–0.003	0.002–0.010	0.003–0.013	1×d1	0.4×d1
K1	v_c	150–200	150–200	150–200		
	f_z	0.002–0.005	0.003–0.014	0.005–0.028	1×d1	0.8×d1
K2	v_c	60–100	60–100	60–100		
	f_z	0.001–0.006	0.003–0.012	0.005–0.023	1×d1	0.8×d1
N1	v_c	150–300	150–300	150–300		
	f_z	0.001–0.004	0.002–0.012	0.004–0.025	1×d1	1×d1
N2	v_c	150–300	150–300	150–300		
	f_z	0.002–0.005	0.003–0.014	0.005–0.028	1×d1	1×d1
N3	v_c	130–250	130–250	130–250		
	f_z	0.002–0.015	0.004–0.030	0.006–0.060	1×d1	2×d1
N4	v_c	60–100	60–100	60–100		
	f_z	0.001–0.009	0.003–0.018	0.004–0.036	1×d1	0.8×d1
N5	v_c	100–250	100–250	100–250		
	f_z	0.002–0.010	0.004–0.020	0.006–0.040	1×d1	1×d1
N6	v_c	80–150	80–150	80–150		
	f_z	0.001–0.008	0.002–0.018	0.004–0.035	1×d1	0.8×d1
N7	v_c	80–130	80–130	80–130		
	f_z	0.002–0.010	0.003–0.020	0.006–0.050	1×d1	1×d1
N8	v_c	80–130	80–130	80–130		
	f_z	0.002–0.010	0.003–0.020	0.006–0.050	1×d1	1×d1
S1	v_c	40–70	40–70	40–70		
	f_z	0.001–0.005	0.003–0.012	0.005–0.025	1×d1	0.8×d1
S2	v_c	20–40	20–40	20–40		
	f_z	0.001–0.002	0.001–0.004	0.002–0.008	1×d1	0.2×d1
H1	v_c	20–45	20–45	20–45		
	f_z	0.001–0.002	0.001–0.003	0.002–0.006	1×d1	0.2×d1
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	100–150	100–150	100–150		
	f_z	0.003–0.025	0.006–0.055	0.010–0.095	1×d1	2×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 43305

Mat.		ø 0.30–0.70	ø 0.80–1.50	ø 1.60–3.00	a_e	a_p
P1	v_c	80–120	80–120	80–120		
	f_z	0.001–0.004	0.002–0.012	0.004–0.025	1×d1	0.6×d1
P2	v_c	70–100	70–100	70–100		
	f_z	0.001–0.003	0.002–0.008	0.003–0.020	1×d1	0.4×d1
P3	v_c	40–70	40–70	40–70		
	f_z	0.001–0.003	0.001–0.010	0.002–0.015	1×d1	0.3×d1
M1	v_c	60–90	60–90	60–90		
	f_z	0.001–0.003	0.002–0.008	0.002–0.012	1×d1	0.3×d1
M2	v_c	30–60	30–60	30–60		
	f_z	0.001–0.003	0.002–0.008	0.002–0.009	1×d1	0.2×d1
K1	v_c	150–200	150–200	150–200		
	f_z	0.001–0.004	0.001–0.010	0.002–0.023	1×d1	0.6×d1
K2	v_c	60–100	60–100	60–100		
	f_z	0.001–0.005	0.002–0.010	0.003–0.019	1×d1	0.6×d1
N1	v_c	150–300	150–300	150–300		
	f_z	0.001–0.003	0.001–0.010	0.002–0.020	1×d1	0.8×d1
N2	v_c	150–300	150–300	150–300		
	f_z	0.001–0.005	0.002–0.011	0.003–0.024	1×d1	0.8×d1
N3	v_c	130–250	130–250	130–250		
	f_z	0.001–0.012	0.002–0.025	0.003–0.050	1×d1	1.5×d1
N4	v_c	60–100	60–100	60–100		
	f_z	0.001–0.007	0.001–0.016	0.002–0.032	1×d1	0.6×d1
N5	v_c	100–250	100–250	100–250		
	f_z	0.001–0.008	0.002–0.018	0.003–0.030	1×d1	0.8×d1
N6	v_c	80–150	80–150	80–150		
	f_z	0.001–0.006	0.001–0.015	0.002–0.030	1×d1	0.6×d1
N7	v_c	80–130	80–130	80–130		
	f_z	0.001–0.008	0.001–0.015	0.002–0.035	1×d1	0.8×d1
N8	v_c	80–130	80–130	80–130		
	f_z	0.001–0.008	0.001–0.016	0.003–0.040	1×d1	0.8×d1
S1	v_c	40–70	40–70	40–70		
	f_z	0.001–0.003	0.002–0.008	0.003–0.018	1×d1	0.6×d1
S2	v_c	20–40	20–40	20–40		
	f_z	0.001–0.002	0.001–0.003	0.002–0.005	1×d1	0.1×d1
H1	v_c	20–45	20–45	20–45		
	f_z	0.001–0.002	0.001–0.003	0.002–0.006	1×d1	0.1×d1
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	100–150	100–150	100–150		
	f_z	0.002–0.020	0.005–0.050	0.008–0.090	1×d1	1.5×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 74075 / 74150 / 74300

Mat.		ø 0.20–0.70	ø 0.70–1.50	ø 1.50–2.80	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.45×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.25×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.003–0.010	0.006–0.020	0.0015–0.035	1×d1	0.15×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.003–0.010	0.006–0.020	0.015–0.035	1×d1	0.35×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.003–0.008	0.005–0.016	0.014–0.028	1×d1	0.2×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.8×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.003–0.010	0.006–0.020	0.015–0.035	1×d1	0.35×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.003–0.01	0.006–0.020	0.015–0035	1×d1	0.8×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.7×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.7×d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	1×d1	0.8×d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	1×d1	0.45×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.002–0.008	0.006–0.015	0.012–0.030	1×d1	0.3×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	80–120	80–120	80–120		
	f_z	0.005–0.012	0.010–0.025	0.020–0.045	1×d1	0.9×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 73000

Mat.		ø 0.50–1.50	ø 1.50–3.00
P1	v_c	70–120	70–120
	f_z	0.004–0.015	0.013–0.030
P2	v_c	60–100	60–100
	f_z	0.003–0.012	0.010–0.025
P3	v_c	50–90	50–90
	f_z	0.002–0.012	0.010–0.023
M1	v_c	50–90	50–90
	f_z	0.002–0.012	0.010–0.016
M2	v_c	40–70	40–70
	f_z	0.001–0.010	0.008–0.013
K1	v_c	120–150	120–150
	f_z	0.004–0.014	0.012–0.028
K2	v_c	100–130	100–130
	f_z	0.003–0.012	0.010–0.025
N1	v_c	150–200	150–200
	f_z	0.005–0.015	0.013–0.030
N2	v_c	150–200	150–200
	f_z	0.006–0.018	0.016–0.035
N3	v_c	150–200	150–200
	f_z	0.005–0.015	0.013–0.030
N4	v_c		
	f_z		
N5	v_c	150–200	150–200
	f_z	0.006–0.018	0.016–0.035
N6	v_c		
	f_z		
N7	v_c		
	f_z		
N8	v_c		
	f_z		
S1	v_c	40–70	40–70
	f_z	0.002–0.010	0.008–0.023
S2	v_c		
	f_z		
H1	v_c		
	f_z		
H2	v_c		
	f_z		
H3	v_c		
	f_z		
O1	v_c		
	f_z		
O2	v_c		
	f_z		
O3	v_c		
	f_z		

Art. 47330

Mat.		ø 0.50–2.00	ø 2.10–5.00	a_e	a_p
P1	v_c	40–60	40–60		
	f_z	0.005–0.025	0.015–0.035	0.2×d1	1×d1
P2	v_c	30–50	30–50		
	f_z	0.004–0.020	0.013–0.030	0.2×d1	1×d1
P3	v_c				
	f_z				
M1	v_c	25–40	25–40		
	f_z	0.004–0.020	0.013–0.030	0.1×d1	1×d1
M2	v_c	20–35	20–35		
	f_z	0.003–0.015	0.012–0.020	0.1×d1	1×d1
K1	v_c	40–60	40–60		
	f_z	0.005–0.025	0.015–0.035	0.2×d1	1×d1
K2	v_c	35–55	35–55		
	f_z	0.004–0.020	0.013–0.030	0.2×d1	1×d1
N1	v_c				
	f_z				
N2	v_c				
	f_z				
N3	v_c				
	f_z				
N4	v_c				
	f_z				
N5	v_c	100–130	100–130		
	f_z	0.006–0.030	0.015–0.060	0.2×d1	1×d1
N6	v_c				
	f_z				
N7	v_c	120–150	120–150		
	f_z	0.006–0.030	0.015–0.060	0.2×d1	1×d1
N8	v_c	120–150	120–150		
	f_z	0.005–0.025	0.010–0.050	0.1×d1	1×d1
S1	v_c				
	f_z				
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

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Art. 47344

Mat.		ø 0.50–2.00	ø 2.10–5.00	ø 5.10–8.00	a_e	a_p
P1	v_c					
	f_z					
P2	v_c					
	f_z					
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c					
	f_z					
K2	v_c					
	f_z					
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c	100–130	100–130	100–130		
	f_z	0.006–0.030	0.015–0.060	0.040–0.100	0.2×d1	1×d1
N6	v_c					
	f_z					
N7	v_c	120–150	120–150	120–150		
	f_z	0.006–0.030	0.015–0.060	0.040–0.100	0.2×d1	1×d1
N8	v_c	120–150	120–150	120–150		
	f_z	0.005–0.025	0.010–0.050	0.040–0.090	0.1×d1	1×d1
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 50810/50812/50814/50818

Mat.		ø 3.00–6.00	ø 6.00–12.00	ø 12.00–20.00
P1	v_c	25–40	25–40	25–40
	f_z	0.120–0.250	0.200–0.300	0.280–0.400
P2	v_c	20–35	20–35	20–35
	f_z	0.100–0.200	0.150–0.250	0.200–0.350
P3	v_c	12–30	12–30	12–30
	f_z	0.080–0.150	0.140–0.220	0.180–0.300
M1	v_c	10–20	10–20	10–20
	f_z	0.050–0.150	0.110–0.200	0.150–0.250
M2	v_c	8–16	8–16	8–16
	f_z	0.040–0.080	0.060–0.140	0.100–0.150
K1	v_c	25–40	25–40	25–40
	f_z	0.070–0.150	0.130–0.200	0.180–0.350
K2	v_c	20–35	20–35	20–35
	f_z	0.050–0.100	0.080–0.150	0.120–0.250
N1	v_c	45–60	45–60	45–60
	f_z	0.100–0.250	0.200–0.300	0.260–0.350
N2	v_c	30–45	30–45	30–45
	f_z	0.130–0.300	0.260–0.350	0.330–0.500
N3	v_c	25–40	25–40	25–40
	f_z	0.100–0.250	0.200–0.300	0.260–0.350
N4	v_c	25–40	25–40	25–40
	f_z	0.006–0.150	0.120–0.180	0.160–0.220
N5	v_c	45–60	45–60	45–60
	f_z	0.100–0.250	0.200–0.300	0.260–0.350
N6	v_c	25–40	25–40	25–40
	f_z	0.060–0.090	0.080–0.110	0.100–0.130
N7	v_c	25–40	25–40	25–40
	f_z	0.050–0.130	0.100–0.180	0.160–0.250
N8	v_c	12–30	12–30	12–30
	f_z	0.030–0.100	0.080–0.130	0.100–0.150
S1	v_c	30–45	30–45	30–45
	f_z	0.040–0.120	0.080–0.160	0.150–0.220
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	30–45	30–45	30–45
	f_z	0.100–0.250	0.220–0.400	0.350–0.700
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 50950

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.10–12.00	ø 12.10 -16.00	ø 16.10–20.00
P1	v_c	80–120	80–120	80–120	80–120	80–120
	f_z	0.060–0.150	0.120–0.250	0.220–0.350	0.320–0.450	0.400–0.500
P2	v_c	60–80	60–80	60–80	60–80	60–80
	f_z	0.050–0.120	0.100–0.220	0.200–0.300	0.280–0.360	0.340–0.450
P3	v_c	50–70	50–70	50–70	50–70	50–70
	f_z	0.040–0.100	0.090–0.180	0.160–0.260	0.240–0.320	0.300–0.380
M1	v_c	40–60	40–60	40–60	40–60	40–60
	f_z	0.030–0.080	0.070–0.150	0.140–0.180	0.170–0.250	0.230–0.320
M2	v_c	30–50	30–50	30–50	30–50	30–50
	f_z	0.030–0.080	0.070–0.130	0.120–0.160	0.150–0.220	0.200–0.300
K1	v_c	100–130	100–130	100–130	100–130	100–130
	f_z	0.100–0.250	0.230–0.350	0.320–0.450	0.400–0.500	0.450–0.600
K2	v_c	60–80	60–80	60–80	60–80	60–80
	f_z	0.060–0.200	0.180–0.280	0.250–0.350	0.320–0.450	0.420–0.500
N1	v_c					
	f_z					
N2	v_c	130–160	130–160	130–160	130–160	130–160
	f_z	0.100–0.250	0.220–0.320	0.300–0.380	0.360–0.450	0.420–0.500
N3	v_c	150–200	150–200	150–200	150–200	150–200
	f_z	0.100–0.270	0.250–0.350	0.330–0.400	0.380–0.480	0.460–0.55
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	30–60	30–60	30–60	30–60	30–60
	f_z	0.005–0.040	0.030–0.070	0.060–0.110	0.100–0.150	0.140–0.180
S2	v_c					
	f_z					
H1	v_c	60–90	60–90	60–90	60–90	60–90
	f_z	0.050–0.120	0.100–0.220	0.200–0.300	0.280–0.360	0.340–0.400
H2	v_c	40–60	40–60	40–60	40–60	40–60
	f_z	0.030–0.070	0.060–0.130	0.110–0.180	0.160–0.240	0.200–0.260
H3	v_c	15–35	15–35	15–35	15–35	15–35
	f_z	0.005–0.030	0.020–0.050	0.040–0.070	0.060–0.100	0.080–0.120
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 50830

Mat.		ø 0.30–1.00	ø 1.10–5.00	ø 5.10–10.00	ø 10.10–15.00	ø 15.10–20.00
P1	v_c	30–60	50–90	50–90	50–90	50–90
	f_z	0.010–0.040	0.038–0.080	0.076–0.110	0.100–0.180	0.170–0.260
P2	v_c	20–35	30–60	30–60	30–60	30–60
	f_z	0.010–0.030	0.028–0.070	0.065–0.090	0.085–0.160	0.150–0.230
P3	v_c	15–30	25–50	25–50	25–50	25–50
	f_z	0.005–0.020	0.018–0.060	0.057–0.085	0.080–0.130	0.125–0.200
M1	v_c	15–30	25–50	25–50	25–50	25–50
	f_z	0.005–0.020	0.018–0.060	0.057–0.085	0.080–0.130	0.125–0.200
M2	v_c	10–20	15–40	15–40	15–40	15–40
	f_z	0.004–0.018	0.016–0.050	0.048–0.090	0.085–0.120	0.110–0.160
K1	v_c	40–80	70–120	70–120	70–120	70–120
	f_z	0.010–0.060	0.055–0.090	0.085–0.110	0.100–0.280	0.260–0.500
K2	v_c	30–50	40–80	40–80	40–80	40–80
	f_z	0.010–0.030	0.028–0.070	0.067–0.100	0.095–0.180	0.170–0.300
N1	v_c	30–60	50–90	50–90	50–90	50–90
	f_z	0.012–0.045	0.042–0.085	0.080–0.140	0.135–0.250	0.230–0.300
N2	v_c	40–80	70–120	70–120	70–120	70–120
	f_z	0.015–0.050	0.480–0.100	0.095–0.180	0.170–0.280	0.260–0.450
N3	v_c	30–70	60–110	60–110	60–110	60–110
	f_z	0.010–0.045	0.040–0.085	0.080–0.160	0.150–0.260	0.240–0.400
N4	v_c	20–40	30–70	30–70	30–70	30–70
	f_z	0.005–0.030	0.028–0.070	0.065–0.090	0.085–0.160	0.150–0.230
N5	v_c					
	f_z					
N6	v_c	15–30	25–50	25–50	25–50	25–50
	f_z	0.012–0.045	0.042–0.085	0.080–0.140	0.135–0.250	0.230–0.300
N7	v_c	15–30	25–50	25–50	25–50	25–50
	f_z	0.012–0.045	0.042–0.085	0.080–0.140	0.135–0.250	0.230–0.300
N8	v_c	10–20	15–35	15–35	15–35	15–35
	f_z	0.004–0.018	0.016–0.050	0.048–0.090	0.085–0.120	0.110–0.180
S1	v_c	20–30	25–50	25–50	25–50	25–50
	f_z	0.020–0.040	0.038–0.070	0.065–0.100	0.095–0.150	0.145–0.200
S2	v_c	10–20	15–35	15–35	15–35	15–35
	f_z	0.004–0.018	0.016–0.050	0.048–0.090	0.085–0.120	0.110–0.180
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	20–40	30–70	30–70	30–70	30–70
	f_z	0.015–0.050	0.048–0.100	0.095–0.180	0.170–0.280	0.260–0.450
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 50838

Mat.		ø 0.30–1.00	ø 1.05–3.00	ø 3.105–6.00
P1	v_c	30–60	50–90	50–90
	f_z	0.010–0.040	0.038–0.050	0.045–0.060
P2	v_c	20–35	30–60	30–60
	f_z	0.010–0.030	0.028–0.045	0.040–0.055
P3	v_c	15–30	25–50	25–50
	f_z	0.005–0.020	0.018–0.035	0.030–0.050
M1	v_c	15–30	25–50	25–50
	f_z	0.005–0.020	0.018–0.035	0.030–0.050
M2	v_c	10–20	15–40	15–40
	f_z	0.004–0.018	0.016–0.030	0.028–0.040
K1	v_c	40–80	70–120	70–120
	f_z	0.010–0.060	0.055–0.070	0.065–0.100
K2	v_c	30–50	40–80	40–80
	f_z	0.010–0.030	0.028–0.055	0.050–0.080
N1	v_c	30–60	50–90	50–90
	f_z	0.012–0.045	0.042–0.060	0.055–0.090
N2	v_c	40–80	70–120	70–120
	f_z	0.015–0.050	0.048–0.070	0.065–0.110
N3	v_c	30–70	60–110	60–110
	f_z	0.010–0.045	0.040–0.065	0.060–0.100
N4	v_c	20–40	30–70	30–70
	f_z	0.005–0.030	0.028–0.050	0.048–0.075
N5	v_c	30–60	50–90	50–90
	f_z	0.015–0.050	0.048–0.070	0.065–0.110
N6	v_c	15–30	25–50	25–50
	f_z	0.012–0.045	0.040–0.065	0.060–0.100
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c	20–35	30–60	30–60
	f_z	0.010–0.030	0.028–0.045	0.040–0.055
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	20–40	30–70	30–70
	f_z	0.015–0.050	0.048–0.070	0.065–0.120
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 50820

Mat.		ø 0.70–2.50	ø 2.60–6.00	ø 6.10–9.00	ø 9.10–11.00	ø 11.10–14.00
P1	v_c	30–60	50–90	50–90	50–90	50–90
	f_z	0.010–0.020	0.018–0.040	0.038–0.065	0.060–0.090	0.085–0.120
P2	v_c	20–35	30–60	30–60	30–60	30–60
	f_z	0.008–0.018	0.016–0.035	0.033–0.055	0.050–0.075	0.070–0.100
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c	20–40	30–70	30–70	30–70	30–70
	f_z	0.010–0.025	0.023–0.045	0.042–0.075	0.072–0.110	0.100–0.150
K2	v_c	15–30	25–50	25–50	25–50	25–50
	f_z	0.010–0.020	0.018–0.040	0.038–0.065	0.060–0.090	0.085–0.120
N1	v_c					
	f_z					
N2	v_c	80–120	110–160	110–160	110–160	110–160
	f_z	0.010–0.030	0.028–0.080	0.075–0.120	0.110–0.160	0.150–0.200
N3	v_c	60–100	50–120	50–120	50–120	50–120
	f_z	0.010–0.030	0.028–0.080	0.075–0.120	0.110–0.160	0.150–0.200
N4	v_c					
	f_z					
N5	v_c	40–70	60–120	60–120	60–120	60–120
	f_z	0.010–0.025	0.023–0.045	0.042–0.075	0.072–0.110	0.100–0.150
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Genannte Werte sind Richtwerte, die je nach Maschine, Aufspannung, Kühlschmierstoff usw. noch angepasst werden müssen.
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Art. 50938

Mat.		ø 1.00–2.40	ø 2.50–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	50–80	120–180	120–180	120–180
	f_z	0.050–0.150	0.120–0.250	0.200–0.300	0.280–0.400
P2	v_c	45–70	100–160	100–160	100–160
	f_z	0.040–0.140	0.100–0.220	0.180–0.280	0.260–0.380
P3	v_c	40–60	90–150	90–150	90–150
	f_z	0.020–0.100	0.080–0.200	0.180–0.250	0.230–0.350
M1	v_c	30–50	80–130	80–130	80–130
	f_z	0.010–0.080	0.060–0.150	0.130–0.200	0.180–0.260
M2	v_c	25–45	70–120	70–120	70–120
	f_z	0.010–0.070	0.060–0.140	0.130–0.180	0.170–0.240
K1	v_c	60–80	150–200	120–200	120–200
	f_z	0.040–0.150	0.120–0.220	0.200–0.350	0.300–0.500
K2	v_c	50–70	130–180	130–180	130–180
	f_z	0.040–0.120	0.100–0.230	0.200–0.310	0.280–0.450
N1	v_c				
	f_z				
N2	v_c	80–110	150–200	150–200	150–200
	f_z	0.400–0.150	0.130–0.280	0.250–0.330	0.310–0.500
N3	v_c	90–130	200–250	200–250	200–250
	f_z	0.400–0.150	0.130–0.300	0.280–0.400	0.380–0.550
N4	v_c				
	f_z				
N5	v_c				
	f_z				
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	20–40	40–60	40–60	40–60
	f_z	0.010–0.030	0.025–0.050	0.040–0.070	0.060–0.100
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 50940

Mat.		ø 1.00–2.40	ø 2.50–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	120–180	120–180	120–180	120–180
	f_z	0.050–0.150	0.120–0.250	0.200–0.300	0.280–0.400
P2	v_c	100–160	100–160	100–160	100–160
	f_z	0.040–0.140	0.100–0.220	0.180–0.280	0.260–0.380
P3	v_c	90–150	90–150	90–150	90–150
	f_z	0.020–0.100	0.080–0.200	0.180–0.250	0.230–0.350
M1	v_c	80–130	80–130	80–130	80–130
	f_z	0.010–0.080	0.060–0.150	0.130–0.200	0.180–0.260
M2	v_c	70–120	70–120	70–120	70–120
	f_z	0.010–0.070	0.060–0.140	0.130–0.180	0.170–0.240
K1	v_c	150–200	150–200	150–200	150–200
	f_z	0.040–0.150	0.120–0.220	0.200–0.350	0.300–0.500
K2	v_c	130–180	130–180	130–180	130–180
	f_z	0.040–0.120	0.100–0.230	0.200–0.310	0.280–0.450
N1	v_c				
	f_z				
N2	v_c	150–200	150–200	150–200	150–200
	f_z	0.400–0.150	0.130–0.280	0.250–0.330	0.310–0.500
N3	v_c	200–250	200–250	200–250	200–250
	f_z	0.400–0.150	0.130–0.300	0.280–0.400	0.380–0.550
N4	v_c				
	f_z				
N5	v_c				
	f_z				
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	40–60	40–60	40–60	40–60
	f_z	0.010–0.030	0.025–0.050	0.040–0.070	0.060–0.100
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

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Art. 50942

Mat.		ø 1.00–2.40	ø 2.50–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	50–80	120–180	120–180	120–180
	f_z	0.040–0.080	0.060–0.150	0.130–0.220	0.200–0.330
P2	v_c	45–70	100–160	100–160	100–160
	f_z	0.040–0.075	0.070–0.190	0.130–0.200	0.180–0.300
P3	v_c	40–60	90–150	90–150	90–150
	f_z	0.030–0.070	0.060–0.130	0.120–0.190	0.170–0.260
M1	v_c	30–50	80–130	80–130	80–130
	f_z	0.010–0.050	0.040–0.120	0.100–0.160	0.150–0.220
M2	v_c	25–45	70–120	70–120	70–120
	f_z	0.010–0.045	0.040–0.100	0.080–0.140	0.130–0.200
K1	v_c	60–80	150–200	120–200	120–200
	f_z	0.050–0.100	0.090–0.230	0.210–0.320	0.300–0.400
K2	v_c	50–70	130–180	130–180	130–180
	f_z	0.040–0.080	0.070–0.180	0.160–0.280	0.250–0.350
N1	v_c				
	f_z				
N2	v_c	80–110	150–200	150–200	150–200
	f_z	0.040–0.130	0.120–0.260	0.240–0.360	0.320–0.450
N3	v_c	90–130	200–250	200–250	200–250
	f_z	0.040–0.140	0.130–0.280	0.260–0.380	0.350–0.480
N4	v_c				
	f_z				
N5	v_c				
	f_z				
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	20–40	40–60	40–60	40–60
	f_z	0.010–0.030	0.025–0.040	0.035–0.070	0.060–0.120
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 52100 / 52200

Mat.		ø 3.00–4.00	ø 4.10–8.00	ø 8.10–12.00	ø 12.10–16.00	ø 16.10–20.00
P1	v_c					
	f_z					
P2	v_c					
	f_z					
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c	60–110	60–110	60–110	60–110	60–110
	f_z	0.040–0.060	0.050–0.200	0.160–0.300	0.280–0.400	0.380–0.500
K2	v_c	50–100	50–100	50–100	50–100	50–100
	f_z	0.020–0.050	0.040–0.160	0.140–0.250	0.220–0.350	0.320–0.400
N1	v_c					
	f_z					
N2	v_c	200–250	200–250	200–250	200–250	200–250
	f_z	0.040–0.060	0.050–0.150	0.140–0.260	0.250–0.400	0.380–0.600
N3	v_c	220–280	220–280	220–280	220–280	220–280
	f_z	0.040–0.060	0.050–0.150	0.140–0.260	0.250–0.400	0.380–0.600
N4	v_c					
	f_z					
N5	v_c	80–120	80–120	80–120	80–120	80–120
	f_z	0.040–0.060	0.050–0.150	0.140–0.250	0.230–0.330	0.300–0.400
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	20–40	20–40	20–40	20–40	20–40
	f_z	0.030–0.050	0.040–0.100	0.080–0.150	0.130–0.180	0.160–0.200
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 52150

Mat.		ø 4.00–7.00	ø 7.10–10.00	ø 10.10–13.00	ø 13.10–16.00	ø 16.10–20.00
P1	v_c	90–120	90–120	90–120	90–120	90–120
	f_z	0.080–0.200	0.180–0.350	0.300–0.400	0350–0.450	0.400–0.600
P2	v_c	80–150	80–150	80–150	80–150	80–150
	f_z	0.050–0.180	0.160–0.250	0.220–0.350	0.330–0.400	0.380–0.550
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c	200–250	200–250	200–250	200–250	200–250
	f_z	0.100–0.250	0.220–0.350	0.330–0.450	0.420–0.550	0.520–0.70
K2	v_c	160–200	160–200	160–200	160–200	160–200
	f_z	0.080–0.180	0.160–0.250	0.230–0.350	0.330–0.500	0.450–0.550
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c	250–300	250–300	250–300	250–300	250–300
	f_z	0.050–0.150	0.130–0.250	0.230–0.350	0.330–0.450	0.430–0.550
N4	v_c					
	f_z					
N5	v_c	80–120	80–120	80–120	80–120	80–120
	f_z	0.050–0.120	0.100–0.220	0.200–0.320	0.300–0.400	0.380–0.450
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c	70–100	70–100	70–100	70–100	70–100
	f_z	0.050–0.100	0.080–0.180	0.160–0.260	0.240–0.300	0.280–0.350
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 50909

Mat.		ø 1.00–2.40	ø 2.50–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	120–180	120–180	120–180	120–180
	f_z	0.040–0.080	0.060–0.150	0.130–0.220	0.200–0.330
P2	v_c	110–160	100–160	100–160	100–160
	f_z	0.040–0.075	0.070–0.190	0.130–0.200	0.180–0.300
P3	v_c	100–150	90–150	90–150	90–150
	f_z	0.030–0.070	0.060–0.130	0.120–0.190	0.170–0.260
M1	v_c	80–130	80–130	80–130	80–130
	f_z	0.010–0.050	0.040–0.120	0.100–0.160	0.150–0.220
M2	v_c	70–120	70–120	70–120	70–120
	f_z	0.010–0.045	0.040–0.100	0.080–0.140	0.130–0.200
K1	v_c	150–200	150–200	120–200	120–200
	f_z	0.050–0.100	0.090–0.230	0.210–0.320	0.300–0.400
K2	v_c	130–180	130–180	130–180	130–180
	f_z	0.040–0.080	0.070–0.180	0.160–0.280	0.250–0.350
N1	v_c				
	f_z				
N2	v_c	150–200	150–200	150–200	150–200
	f_z	0.040–0.130	0.120–0.260	0.240–0.360	0.320–0.450
N3	v_c	200–250	200–250	200–250	200–250
	f_z	0.040–0.140	0.130–0.280	0.260–0.380	0.350–0.480
N4	v_c				
	f_z				
N5	v_c	90–150	90–150	90–150	90–150
	f_z	0.050–0.100	0.090–0.230	0.210–0.320	0.300–0.400
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	40–70	40–70	40–70	40–70
	f_z	0.010–0.030	0.025–0.040	0.035–0.070	0.060–0.120
S2	v_c				
	f_z				
H1	v_c	40–80	40–80	40–80	40–80
	f_z	0.010–0.020	0.018–0.035	0.030–0.060	0.050–0.100
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

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Art. 50912 / 50916

Mat.		ø 1.00–1.90	ø 2.00–5.00	ø 5.10–8.00	ø 8.10 -12.70
P1	v_c	70–130	70–130	70–130	70–130
	f_z	0.040–0.060	0.050–0.120	0.110–0.250	0.240–0.400
P2	v_c	60–120	60–120	60–120	60–120
	f_z	0.030–0.050	0.045–0.100	0.090–0.220	0.200–0.350
P3	v_c	50–100			
	f_z	0.030–0.050			
M1	v_c	50–70			
	f_z	0.030–0.050			
M2	v_c	35–60			
	f_z	0.025–0.045			
K1	v_c	80–120	80–120	80–120	80–120
	f_z	0.050–0.080	0.070–0.150	0.140–0.300	0.280–0.500
K2	v_c	60–100	60–100	60–100	60–100
	f_z	0.040–0.070	0.060–0.130	0.120–0.260	0.250–0.450
N1	v_c				
	f_z				
N2	v_c				
	f_z				
N3	v_c				
	f_z				
N4	v_c				
	f_z				
N5	v_c				
	f_z				
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	30–60			
	f_z	0.010–0.040			
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 50920 / 50925 / 50930

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.00–10.00
P1	v_c	70–120	70–120	70–120
	f_z	0.050–0.150	0.140–0.250	0.240–0.380
P2	v_c	70–110	70–110	70–110
	f_z	0.040–0.130	0.120–0.230	0.220–0.360
P3	v_c			
	f_z			
M1	v_c			
	f_z			
M2	v_c			
	f_z			
K1	v_c	70–110	70–110	70–110
	f_z	0.050–0.170	0.160–0.280	0.260–0.450
K2	v_c	60–100	60–100	60–100
	f_z	0.050–0.140	0.130–0.250	0.240–0.400
N1	v_c			
	f_z			
N2	v_c			
	f_z			
N3	v_c			
	f_z			
N4	v_c			
	f_z			
N5	v_c			
	f_z			
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 52903 / 52906 / 52909

Mat.		ø 1.00–1.90	ø 2.00–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	70–110	70–110	70–110	70–110
	f_z	0.025–0.055	0.050–0.130	0.125–0.170	0.165–0.215
P2	v_c	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
P3	v_c	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
M1	v_c	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
M2	v_c	50–90	50–90	50–90	50–90
	f_z	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.150
K1	v_c	90–140	90–140	90–140	90–140
	f_z	0.050–0.110	0.100–0.270	0.260–0.340	0.320–0.420
K2	v_c	80–120	80–120	80–120	80–120
	f_z	0.040–0.100	0.090–0.250	0.240–0.300	0.280–0.360
N1	v_c	120–170	120–170	120–170	120–170
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N2	v_c	150–200	150–200	150–200	150–200
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N3	v_c	200–250	200–250	200–250	200–250
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N4	v_c	90–130	90–130	90–130	90–130
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N5	v_c	150–200	150–200	150–200	150–200
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N6	v_c	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	30–60	30–60	30–60	30–60
	f_z	0.015–0.035	0.030–0.085	0.080–0.110	0.100–0.135
S2	v_c	20–50	20–50	20–50	20–50
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
H1	v_c	70–110	70–110	70–110	70–110
	f_z	0.010–0.020	0.018–0.050	0.045–0.065	0.060–0.080
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c	70–110	70–110	70–110	70–110
	f_z	0.025–0.055	0.050–0.130	0.125–0.170	0.165–0.215
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 52912 / 52916

Mat.		ø 1.00–1.90	ø 2.00–5.00	ø 5.10–8.00	ø 8.10–10.00
P1	v_c	70–110	70–110	70–110	70–110
	f_z	0.020–0.060	0.050–0.130	0.125–0.170	0.165–0.190
P2	v_c	60–100	60–100	60–100	60–100
	f_z	0.015–0.050	0.045–0.120	0.115–0.150	0.140–0.160
P3	v_c	50–90	50–90	50–90	50–90
	f_z	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.120
M1	v_c	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.160
M2	v_c	50–90	50–90	50–90	50–90
	f_z	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.120
K1	v_c	90–140	90–140	90–140	90–140
	f_z	0.050–0.110	0.100–0.270	0.260–0.340	0.320–0.350
K2	v_c	80–120	80–120	80–120	80–120
	f_z	0.040–0.100	0.090–0.250	0.240–0.300	0.280–0.300
N1	v_c	90–130	90–130	90–130	90–130
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.350
N2	v_c	150–200	150–200	150–200	150–200
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.350
N3	v_c	170–220	170–220	170–220	170–220
	f_z	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.350
N4	v_c	90–130	90–130	90–130	90–130
	f_z	0.025–0.055	0.050–0.130	0.125–0.170	0.165–0.195
N5	v_c	150–200	150–200	150–200	1050–200
	f_z	0.040–0.100	0.090–0.250	0.240–0.300	0.280–0.300
N6	v_c	60–100	60–100	60–100	60–100
	f_z	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.110
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c	30–60	30–60	30–60	30–60
	f_z	0.015–0.035	0.030–0.085	0.080–0.110	0.100–0.100
S2	v_c	20–50	20–50	20–50	20–50
	f_z	0.010–0.040	0.030–0.100	0.080–0.130	0.10–0.110
H1	v_c	60–100	60–100	60–100	60–100
	f_z	0.010–0.020	0.018–0.050	0.045–0.065	0.060–0.080
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c	70–110	70–110	70–110	70–110
	f_z	0.020–0.060	0.050–0.130	0.125–0.170	0.165–0.190
O2	v_c				
	f_z				
O3	v_c				
	f_z				

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Art. 52920 / 52930

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.10–10.00
P1	v_c			
	f_z			
P2	v_c			
	f_z			
P3	v_c	40–80	40–80	40–80
	f_z	0.050–0.085	0.080–0.110	0.100–0.150
M1	v_c	30–70	30–70	30–70
	f_z	0.045–0.070	0.065–0.085	0.080–0.120
M2	v_c	25–55	25–55	25–55
	f_z	0.035–0.050	0.045–0.065	0.080–0.110
K1	v_c	70–110	70–110	70–110
	f_z	0.100–0.200	0.180–0.250	0.230–0.280
K2	v_c	60–100	60–100	60–100
	f_z	0.090–0.180	0.170–0.240	0.220–0.260
N1	v_c	60–100	60–100	60–100
	f_z	0.130–0.250	0.230–0.340	0.320–0.380
N2	v_c	65–100	65–100	65–100
	f_z	0.130–0.250	0.230–0.340	0.320–0.380
N3	v_c	70–110	70–110	70–110
	f_z	0.130–0.250	0.230–0.340	0.320–0.380
N4	v_c			
	f_z			
N5	v_c			
	f_z			
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c	30–60	30–60	30–60
	f_z	0.035–0.070	0.065–0.085	0.080–0.110
S2	v_c	20–50	20–50	20–50
	f_z	0.030–0.060	0.050–0.080	0.070–0.100
H1	v_c	20–40	20–40	20–40
	f_z	0.010–0.035	0.030–0.040	0.035–0.060
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c	60–100	60–100	60–100
	f_z	0.090–0.180	0.170–0.240	0.220–0.260
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 54906 / 54909

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	v_c	70–110	70–110	70–110
	f_z	0.050–0.130	0.125–0.170	0.165–0.215
P2	v_c	60–100	60–100	60–100
	f_z	0.045–0.120	0.115–0.150	0.140–0.190
P3	v_c			
	f_z			
M1	v_c			
	f_z			
M2	v_c			
	f_z			
K1	v_c	90–140	90–140	90–140
	f_z	0.100–0.270	0.260–0.340	0.320–0.420
K2	v_c	80–120	80–120	80–120
	f_z	0.090–0.250	0.240–0.300	0.280–0.360
N1	v_c			
	f_z			
N2	v_c			
	f_z			
N3	v_c	170–220	170–220	170–220
	f_z	0.100–0.250	0.240–0.340	0.320–0.420
N4	v_c			
	f_z			
N5	v_c	150–200	150–200	150–200
	f_z	0.100–0.250	0.240–0.340	0.320–0.420
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 54912 / 54916

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.10–10.00
P1	v_c	70–110	70–110	70–110
	f_z	0.050–0.130	0.125–0.170	0.165–0.190
P2	v_c	60–100	60–100	60–100
	f_z	0.045–0.120	0.115–0.150	0.140–0.160
P3	v_c			
	f_z			
M1	v_c			
	f_z			
M2	v_c			
	f_z			
K1	v_c	90–130	90–130	90–130
	f_z	0.100–0.250	0.240–0.340	0.320–0.350
K2	v_c	150–200	150–200	150–200
	f_z	0.100–0.250	0.240–0.340	0.320–0.350
N1	v_c			
	f_z			
N2	v_c			
	f_z			
N3	v_c	170–220	170–220	170–220
	f_z	0.100–0.250	0.240–0.340	0.320–0.350
N4	v_c			
	f_z			
N5	v_c	150–200	150–200	150–200
	f_z	0.100–0.250	0.240–0.340	0.320–0.350
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 54920 / 54930

Mat.		ø 3.00–5.00	ø 5.10–8.00	ø 8.10–10.00
P1	v_c	70–120	70–120	70–120
	f_z	0.050–0.150	0.140–0.250	0.240–0.380
P2	v_c	70–110	70–110	70–110
	f_z	0.040–0.130	0.120–0.230	0.220–0.360
P3	v_c			
	f_z			
M1	v_c			
	f_z			
M2	v_c			
	f_z			
K1	v_c	70–110	70–110	70–110
	f_z	0.050–0.170	0.160–0.280	0.260–0.450
K2	v_c	60–100	60–100	60–100
	f_z	0.050–0.140	0.130–0.250	0.240–0.400
N1	v_c			
	f_z			
N2	v_c			
	f_z			
N3	v_c	70–110	70–110	70–110
	f_z	0.050–0.170	0.160–0.280	0.260–0.450
N4	v_c			
	f_z			
N5	v_c	50–100	50–100	50–100
	f_z	0.050–0.130	0.120–0.230	0.220–0.360
N6	v_c			
	f_z			
N7	v_c			
	f_z			
N8	v_c			
	f_z			
S1	v_c			
	f_z			
S2	v_c			
	f_z			
H1	v_c			
	f_z			
H2	v_c			
	f_z			
H3	v_c			
	f_z			
O1	v_c			
	f_z			
O2	v_c			
	f_z			
O3	v_c			
	f_z			

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Art. 50840

Mat.		ø 2.00–5.00	ø 5.10–8.00	ø 8.10–11.00	ø 11.10–14.00
P1	v_c	30–60	30–60	30–60	30–60
	f_z	0.020–0.050	0.045–0.090	0.080–0.150	0.130–0.200
P2	v_c	25–50	25–50	25–50	25–50
	f_z	0.015–0.045	0.040–0.080	0.075–0.120	0.100–0.150
P3	v_c				
	f_z				
M1	v_c	20–45	20–45	20–45	20–45
	f_z	0.15–0.040	0.035–0.070	0.065–0.100	0.090–0.130
M2	v_c	15–35	15–35	15–35	15–35
	f_z	0.010–0.035	0.030–0.060	0.055–0.085	0.080–0.110
K1	v_c	30–60	30–60	30–60	30–60
	f_z	0.020–0.050	0.45–0.090	0.080–0.150	0.130–0.200
K2	v_c	25–50	25–50	25–50	25–50
	f_z	0.015–0.045	0.040–0.080	0.075–0.120	0.100–0.150
N1	v_c	30–60	30–60	30–60	30–60
	f_z	0.020–0.050	0.045–0.090	0.080–0.150	0.130–0.200
N2	v_c	60–100	60–100	60–100	60–100
	f_z	0.030–0.080	0.070–0.150	0.140–0.220	0.200–0.300
N3	v_c	50–90	50–90	50–90	50–90
	f_z	0.025–0.070	0.060–0.130	0.120–0.190	0.180–0.250
N4	v_c	50–90	50–90	50–90	50–90
	f_z	0.030–0.090	0.080–0.150	0.130–0.200	0.180–0.300
N5	v_c				
	f_z				
N6	v_c				
	f_z				
N7	v_c				
	f_z				
N8	v_c				
	f_z				
S1	v_c				
	f_z				
S2	v_c				
	f_z				
H1	v_c				
	f_z				
H2	v_c				
	f_z				
H3	v_c				
	f_z				
O1	v_c				
	f_z				
O2	v_c				
	f_z				
O3	v_c				
	f_z				

Art. 55654 / 55338

Mat.		ø 1.00–2.00	ø 2.10–5.00	ø 5.10–8.00	ø 8.10–11.00	ø 11.10–14.00
P1	v_c	40–60	40–60	40–60	40–60	40–60
	f_z	0.015–0.040	0.035–0.080	0.075–0.170	0.160–0.230	0.200–0.300
P2	v_c	30–50	30–50	30–50	30–50	30–50
	f_z	0.010–0.035	0.030–0.075	0.070–0.155	0.150–0.210	0.190–0.250
P3	v_c					
	f_z					
M1	v_c	25–40	25–40	25–40	25–40	25–40
	f_z	0.010–0.030	0.025–0.070	0.060–0.100	0.090–0.140	0.120–0.200
M2	v_c					
	f_z					
K1	v_c	60–100	60–100	60–100	60–100	60–100
	f_z	0.020–0.050	0.040–0.090	0.080–0.180	0.160–0.280	0.250–0.350
K2	v_c	40–80	40–80	40–80	40–80	40–80
	f_z	0.015–0.040	0.035–0.080	0.700–0.170	0.150–0.230	0.210–0.300
N1	v_c					
	f_z					
N2	v_c	80–120	80–120	80–120	80–120	80–120
	f_z	0.020–0.060	0.050–0.120	0.100–0.230	0.210–0.340	0.330–0.450
N3	v_c	60–100	60–100	60–100	60–100	60–100
	f_z	0.020–0.060	0.050–0.120	0.100–0.230	0.210–0.340	0.330–0.450
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	30–50	30–50	30–50	30–50	30–50
	f_z	0.010–0.030	0.025–0.070	0.060–0.130	0.100–0.160	0.150–0.200
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 58000 / 58500

Mat.		ø 0.99–2.00	ø 2.01–3.00	ø 3.01–4.00	ø 4.01–5.00	ø 5.01–6.00
P1	v_c	20–30	20–30	20–30	20–30	20–30
	f_z	0.050–0.100	0.080–0.130	0.120–0.180	0.170–0.230	0.220–0.280
P2	v_c	15–25	15–25	15–25	15–25	15–25
	f_z	0.040–0.080	0.070–0.120	0.110–0.170	0.160–0.220	0.210–0.260
P3	v_c	10–20	10–20	10–20	10–20	10–20
	f_z	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
M1	v_c	10–20	10–20	10–20	10–20	10–20
	f_z	0.040–0.080	0.070–0.120	0.110–0.170	0.160–0.220	0.200–0.260
M2	v_c	10–15	10–15	10–15	10–15	10–15
	f_z	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
K1	v_c	20–30	20–30	20–30	20–30	20–30
	f_z	0.050–0.100	0.080–0.150	0.140–0.220	0.200–0.260	0.030–0.280
K2	v_c	15–25	15–25	15–25	15–25	15–25
	f_z	0.050–0.090	0.75–0.140	0.130 0.200	0.180–0.240	0.200–0.260
N1	v_c					
	f_z					
N2	v_c	30–40	30–40	30–40	30–40	30–40
	f_z	0.060–0.120	0.110–0.160	0.150–0.220	0.200–0.260	0.240–0.300
N3	v_c	25–35	25–35	25–35	25–35	25–35
	f_z	0.060–0.120	0.110–0.160	0.150–0.220	0.200–0.260	0.240–0.300
N4	v_c	15–25	15–25	15–25	15–25	15–25
	f_z	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
N5	v_c	30–40	30–40	30–40	30–40	30–40
	f_z	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	10–15	10–15	10–15	10–15	10–15
	f_z	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 40000

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	60–90	60–90	60–90		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.5×d1
P2	v_c	50–80	50–80	50–80		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.3×d1
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c	40–60	40–60	40–60		
	f_z	0.020–0.070	0.050–0.110	0.060–0.140	1×d1	1×d1
K2	v_c	30–50	30–50	30–50		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.4×d1
N1	v_c	100–150	100–150	100–150		
	f_z	0.015–0.060	0.040–0.120	0.060–0.200	1×d1	1×d1
N2	v_c	200–250	200–250	200–250		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N3	v_c	180–220	180–220	180–220		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N4	v_c	50–100	50–100	50–100		
	f_z	0.015–0.050	0.030–0.080	0.060–0.120	1×d1	0.5×d1
N5	v_c	100–150	100–150	100–150		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N6	v_c	30–60	30–60	30–60		
	f_z	0.015–0.050	0.040–0.100	0.060–0.140	1×d1	0.7×d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 40600

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	80–100	80–100	80–100		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.5×d1
P2	v_c	70–90	70–90	70–90		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.3×d1
P3	v_c	60–80	60–80	60–80		
	f_z					
M1	v_c	40–60	40–60	40–60		
	f_z	0.015–0.050	0.050–0.080	0.080–0.120	1×d1	0.3×d1
M2	v_c					
	f_z					
K1	v_c	60–80	60–80	60–80		
	f_z	0.020–0.070	0.050–0.110	0.060–0.140	1×d1	1×d1
K2	v_c	40–60	40–60	40–60		
	f_z	0.015–0.060	0.050–0.100	0.060–0.140	1×d1	0.4×d1
N1	v_c					
	f_z					
N2	v_c	230–280	230–280	230–280		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N3	v_c	200–250	200–250	200–250		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N4	v_c					
	f_z					
N5	v_c	120–170	120–170	120–170		
	f_z	0.020–0.070	0.050–0.120	0.070–0.200	1×d1	1×d1
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 40002

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–2.00	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.015–0.060	0.030–0.110	0.060–0.140	1×d1	1×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.015–0.060	0.030–0.110	0.050–0.130	1×d1	0.6×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.5×d1
M1	v_c	40–60	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.5×d1
M2	v_c					
	f_z					
K1	v_c	60–80	60–80	60–80		
	f_z	0.015–0.060	0.030–0.110	0.060–0.140	1×d1	1×d1
K2	v_c	50–70	60–80	60–80		
	f_z	0.015–0.060	0.030–0.100	0.050–0.130	1×d1	0.6×d1
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Schnittdaten
Données de coupe
Parametri di lavoro
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Art. 40602

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	70–100	70–100	70–100		
	f_z	0.015–0.060	0.030–0.110	0.060–0.140	1×d1	1× ×d1
P2	v_c	60–90	60–90	60–90		
	f_z	0.015–0.060	0.030–0.110	0.050–0.130	1×d1	0.6×d1
P3	v_c	50–80	50–80	50–80		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.5×d1
M1	v_c	50–80	50–80	50–80		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.5×d1
M2	v_c					
	f_z					
K1	v_c	70–10	70–10	70–10		
	f_z	0.015–0.060	0.030–0.110	0.060–0.140	1×d1	1×d1
K2	v_c	60–90	60–90	60–90		
	f_z	0.015–0.060	0.030–0.100	0.050–0.130	1×d1	0.6×d1
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c	60–90	60–90	60–90		
	f_z	0.010–0.050	0.020–0.060	0.040–0.070	1×d1	0.05×d1
H2	v_c	50–70	50–70	50–70		
	f_z	0.010–0.040	0.020–0.050	0.030–0.060	1×d1	0.05×d1
H3	v_c	40–60	40–60	40–60		
	f_z	0.005–0.030	0.015–0.035	0.030–0.050	1×d1	0.05×d1
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 40004

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.020–0.060	0.030–0.110	0.060–0.140	1×d1	0.5×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.015–0.060	0.030–0.110	0.050–0.130	1×d1	0.5×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.4×d1
M1	v_c	40–60	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.4×d1
M2	v_c					
	f_z					
K1	v_c	60–80	60–80	60–80		
	f_z	0.020–0.060	0.030–0.110	0.060–0.140	1×d1	0.80×d1
K2	v_c	50–70	50–70	50–70		
	f_z	0.150–0.050	0.030–0.100	0.060–0.130	1×d1	0.70×d1
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 40604

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	70–100	70–100	70–100		
	f_z	0.020–0.060	0.030–0.110	0.060–0.140	1×d1	0.5×d1
P2	v_c	60–90	60–90	60–90		
	f_z	0.015–0.060	0.030–0.110	0.050–0.130	1×d1	0.5×d1
P3	v_c	50–80	50–80	50–80		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.4×d1
M1	v_c	50–80	50–80	50–80		
	f_z	0.010–0.050	0.020–0.100	0.040–0.120	1×d1	0.4×d1
M2	v_c					
	f_z					
K1	v_c	70–100	70–100	70–100		
	f_z	0.020–0.060	0.030–0.110	0.060–0.140	1×d1	0.80×d1
K2	v_c	60–90	60–90	60–90		
	f_z	0.150–0.050	0.030–0.100	0.060–0.130	1×d1	0.70×d1
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c	60–90	60–90	60–90		
	f_z	0.010–0.050	0.020–0.060	0.040–0.070	1×d1	0.05×d1
H2	v_c	50–70	50–70	50–70		
	f_z	0.010–0.040	0.020–0.050	0.030–0.060	1×d1	0.05×d1
H3	v_c	40–60	40–60	40–60		
	f_z	0.005–0.030	0.015–0.035	0.030–0.050	1×d1	0.05×d1
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 40006 / 40008

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c	60–80	60–80	60–80		
	f_z	0.010–0.020	0.015–0.070	0.060–0.110	0.5×d1	1.5×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.015–0.070	0.060–0.110	0.5×d1	1.5×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.010–0.020	0.015–0.060	0.050–0.090	0.4×d1	1.5×d1
M1	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.015–0.060	0.050–0.090	0.4×d1	1.5×d1
M2	v_c	40–60	40–60	40–60		
	f_z	0.005–0.150	0.010–0.050	0.040–0.080	0.3×d1	1.5×d1
K1	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.015–0.070	0.060–0.110	0.5×d1	1.5×d1
K2	v_c	40–60	40–60	40–60		
	f_z	0.010–0.020	0.015–0.060	0.050–0.090	0.4×d1	1.5×d1
N1	v_c					
	f_z					
N2	v_c					
	f_z					
N3	v_c					
	f_z					
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.015–0.060	0.050–0.090	0.4×d1	1.5×d1
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c					
	f_z					
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 47000 / 47500

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_e	a_p
P1	v_c					
	f_z					
P2	v_c					
	f_z					
P3	v_c					
	f_z					
M1	v_c					
	f_z					
M2	v_c					
	f_z					
K1	v_c					
	f_z					
K2	v_c					
	f_z					
N1	v_c	300–600	300–600	300–600		
	f_z	0.030–0.050	0.050–0.120	0.120–0.200	1×d1	0.5×d1
N2	v_c	300–1000	300–1000	300–1000		
	f_z	0.030–0.060	0.060–0.140	0.140–0.250	1×d1	0.5×d1
N3	v_c	300–1000	300–1000	300–1000		
	f_z	0.030–0.060	0.060–0.140	0.140–0.250	1×d1	0.5×d1
N4	v_c					
	f_z					
N5	v_c					
	f_z					
N6	v_c					
	f_z					
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c					
	f_z					
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	300–600	300–600	300–600		
	f_z	0.030–0.050	0.050–0.120	0.120–0.200	1×d1	0.5×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Le shop internet Sphinx Outils SA
Il webshop della Sphinx Utensili srl
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Notes

Notizen
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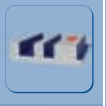
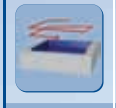
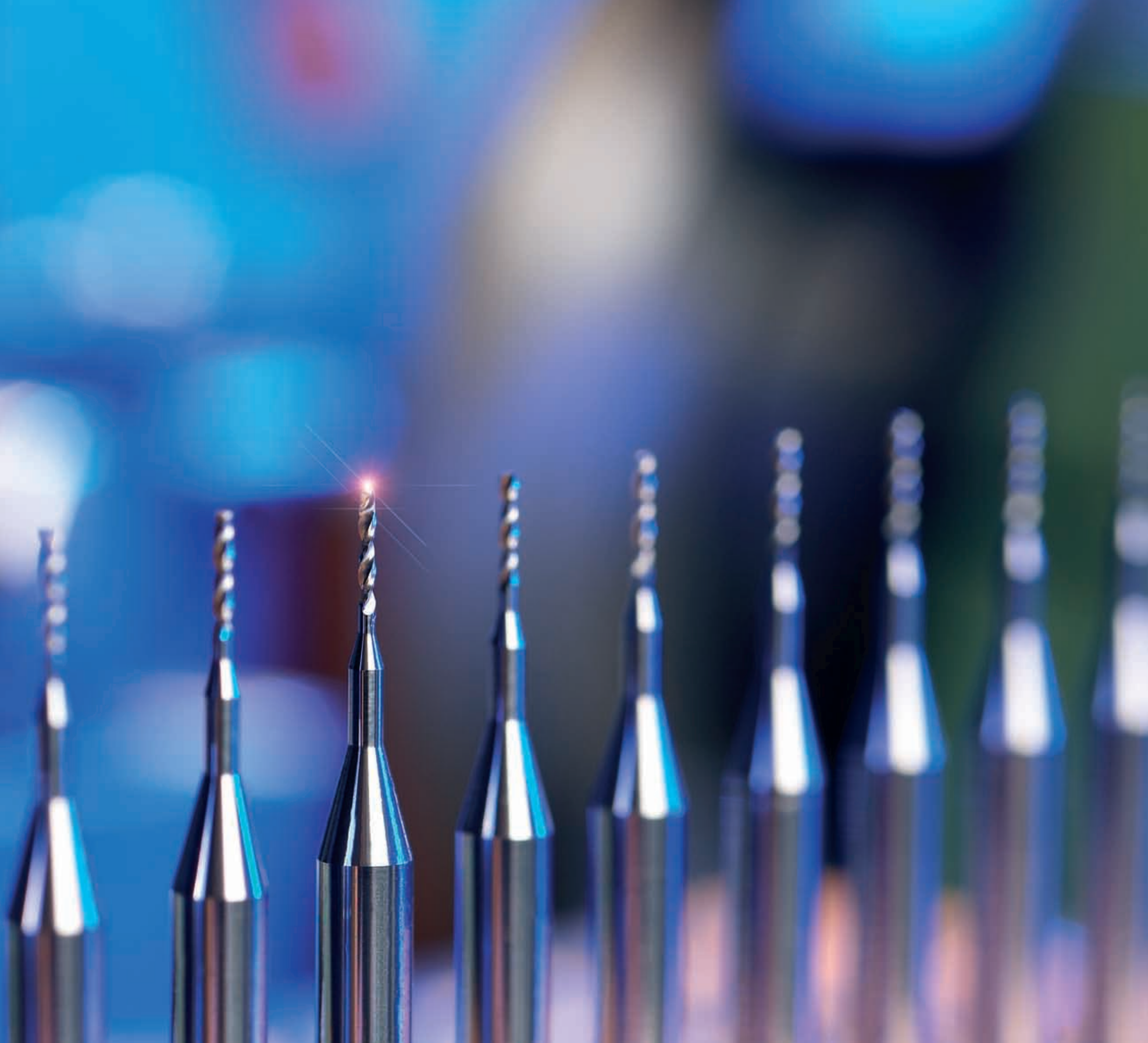
Anwendungen
Applications

	Sackloch Blind hole
	Sackloch mit Senkung Blind hole with countersink
	Stufenbohrung Step hole
	Gravierstichel flach Graver for groove, flat bottom
	Gravierstichel rund Graver for groove, full bottom radius
	Radius einstechen Plunge radius
	Radius längs Straight radius milling
	Durchgangsbohrung Through hole
	Durchgang mit Senkung Through hole with countersink
	Mehrere Schichten Multi-composite material
	Querbohrung Cross hole
	In Rundung Round surface
	In Schräge Inclined surface
	Kantenbruch 60° Chamfer 60°
	Kantenbruch 90° Chamfer 90°

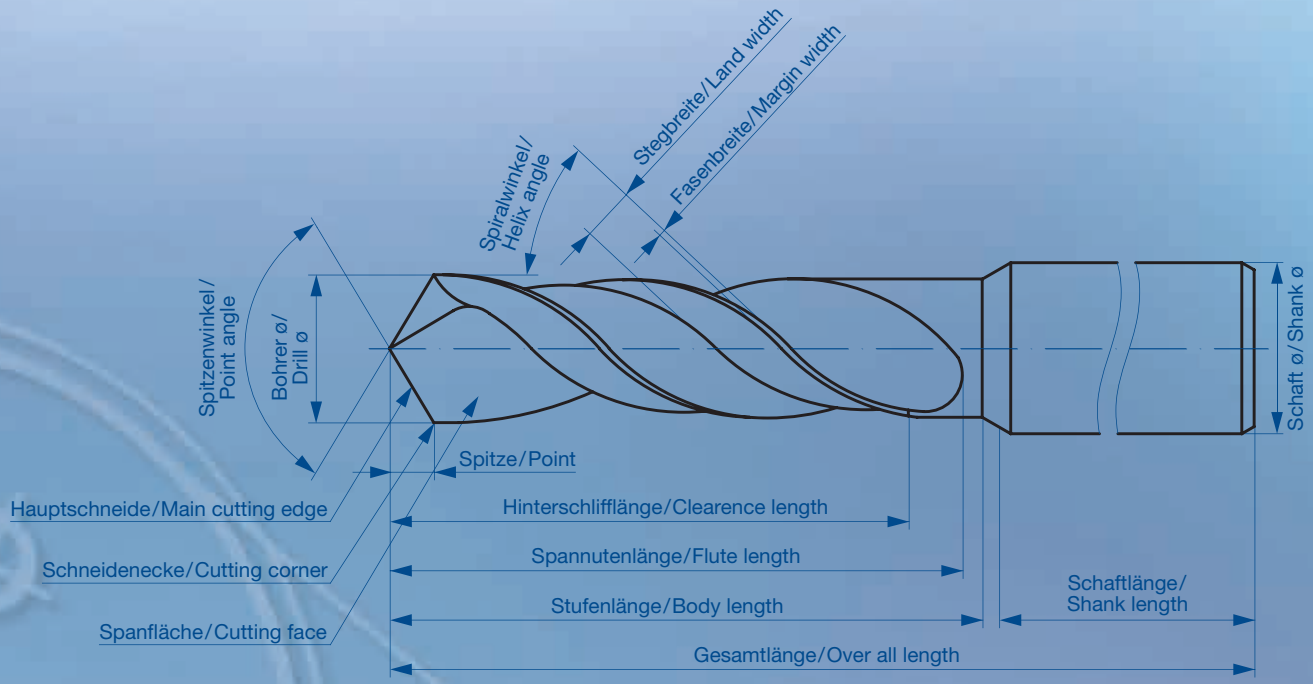
	Kantenbruch 120° Chamfer 120°
	Senkung 60° Countersink 60°
	Senkung 90° Countersink 90°
	Senkung 120° Countersink 120°
	Senkung 130° Countersink 130°
	Senkung 140° Countersink 140°
	Senkung 90°–140° Double angle countersink 90°–140°
	Einstechen Plunge
	Nuten normal Straight groove milling
	Nuten schräg Angular groove milling
	Schlichten Stirnseite Front side finishing
	Schlichten mit Umfang Side finishing
	Schruppen Stirnseite Front side roughing
	Zyklisch eckig Angular milling
	Zyklisch rund Circular milling

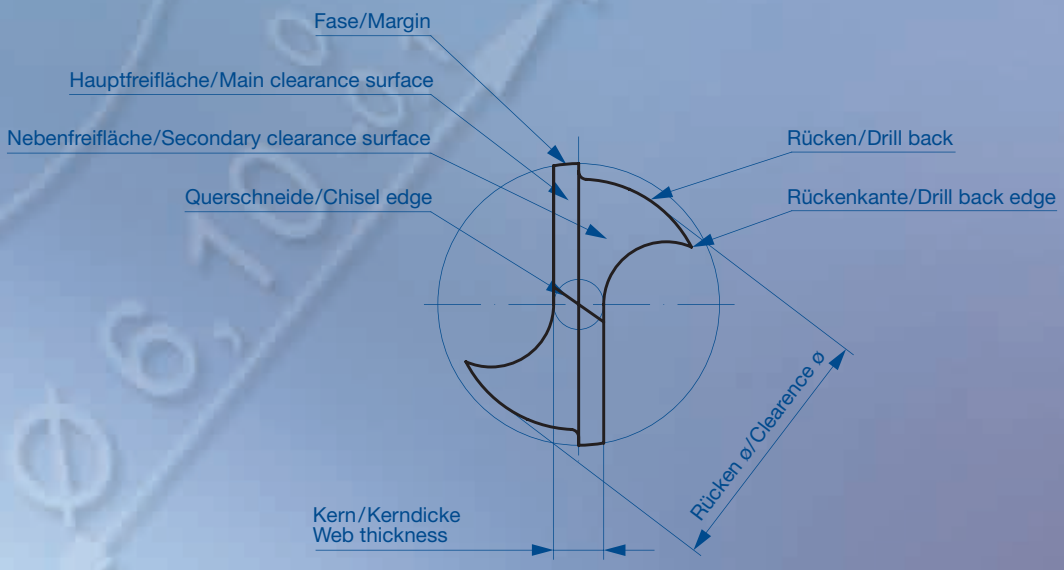
Werkstoffgruppen
Workpiece materials

		Material Material	Festigkeit (N/mm²) Härte hardness	Beispiel example
P	P1	unlegierte Stähle, Stahlguss unalloyed steels, steel casting	bis up to 700 N/mm²	St37, St42, C22, GS38, St50, St60, C35, GS52
	P2	legierte Stähle alloyed steels	bis up to 700–1000 N/mm²	St70, C45, GS62, 16MnCr5, 42CrMo4, 90MnCrV8, 100Cr6
	P3	hochlegierte Stähle High alloyed/high-grade steels	bis/up to 1400 N/mm²	S210Cr12, 34CrAlNi7
M	M1	nichtrostender Stahl ferritische/martensitische Ferritic/martensitic stainless steels		
	M2	nichtrostender Stahl austenitisch Austenitic stainless steels		
K	K1	Grauguss grey cast iron		
	K2	Gusseisen mit Kugelgraphit ferritisch, perrlitisch Spheroidal/ductile cast iron		
N	N1	Alu-Knetlegierungen malleable alu alloy	bis up to 350 N/mm²	Al99.5, AlMg1, AlCuSiPb, G-AlCu5Ni1,5, AlZnMgCu0,5
	N2	Alu-Gusslegierung <10% Si cast alu alloy <10% Si	bis up to 300 N/mm²	G-AlCu4TiMg, G-AlSi7Mg, G-AlSi9Mg, G-AlSi10Mg, G-AlSi12
	N3	Alu-Gusslegierung >10% Si cast alu alloy >10% Si	bis up to 450 N/mm²	G-AlSi17Cu4, G-AlSi21CuNiMg
	N4	Magnesiumlegierungen Magnesium, magnesium alloys		
	N5	Kupfer und Kupferlegierungen kurzspanend Copper nickel alloys, brass		
	N6	Kupfer und Kupferlegierungen langspanend Copper, forging copper alloys		
	N7	Silber Silver		
	N8	Gold Gold		
S	S1	Titan, Titanlegierungen Titanium, titanium alloys	über over 700 N/mm²	Ti6Al4V, Ti-4Al-4Mo-2Sn
	S2	Warmfeste Legierungen Ni- oder Co-Basis Ni/Co based super alloys		
H	H1	gehärtete Stähle, 50–55 HRC Hardened steels 50–55 HRC		
	H2	gehärtete Stähle, 55–60 HRC Hardened steels 55–60 HRC		
	H3	gehärtete Stähle, >60 HRC Hardened steels >60 HRC		
O	O1	Thermoplaste, Duroplaste ohne abrasive Füllstoffe Thermoplast, thermosetting plastics		
	O2	Kunststoffe Faserverstärkt Fiber-reinforced plastics		
	O3	Graphit Graphite		EDM36



Spiralbohrer
Twist drill



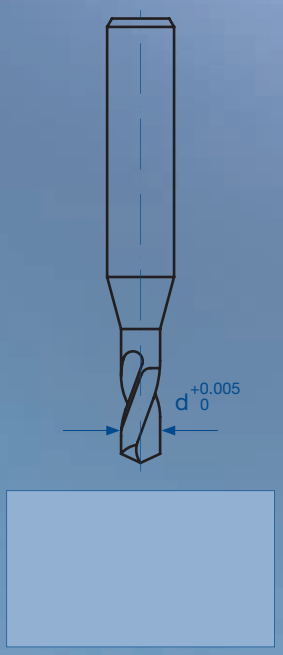


Bearbeitungsverfahren Mikrobohren
Machining process for micro drilling

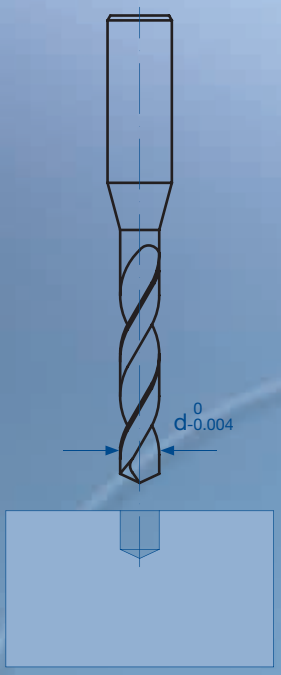
Zentrier- oder Pilotbohrung wird bei Bohr-ø < 1.00 mm empfohlen.

For holes ø < 1.00 mm a center- or pilothole is recommended.

Art. 56033 – ø 0.50

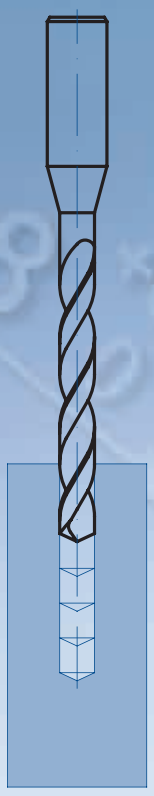


Art. 51200 – ø 0.50



Tieflochbohrzyklus für langspanende Werkstoffe

Deep-hole drilling cycle for long-chipping materials

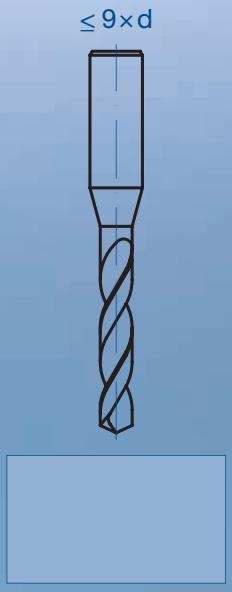


Entspänen
Pecking cycle

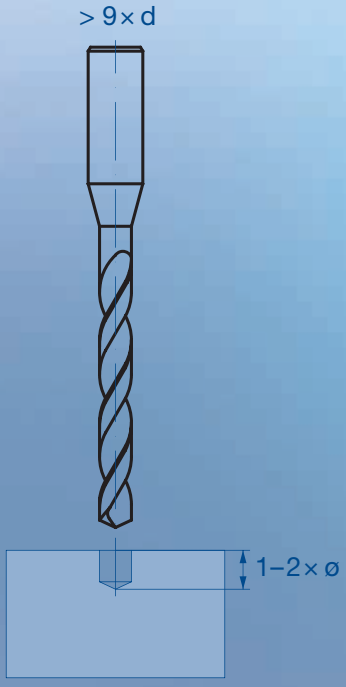
Zentrierbohren
Center drilling

Saubere Eintrittsfläche

Smooth entering surface



· Keine Pilotbohrung
· No pilothole



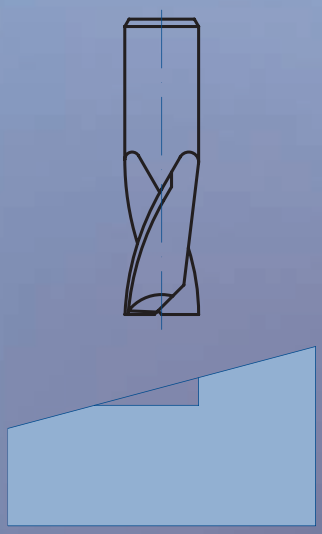
· Pilotbohrung 1–2× ø empfohlen
· Pilothole, 1–2× ø deep, recommended

Zentrieren auf rauer/schräger Eintrittsfläche

Centering on a rough or inclined entering surface

Pilotbohrung/Pilothole

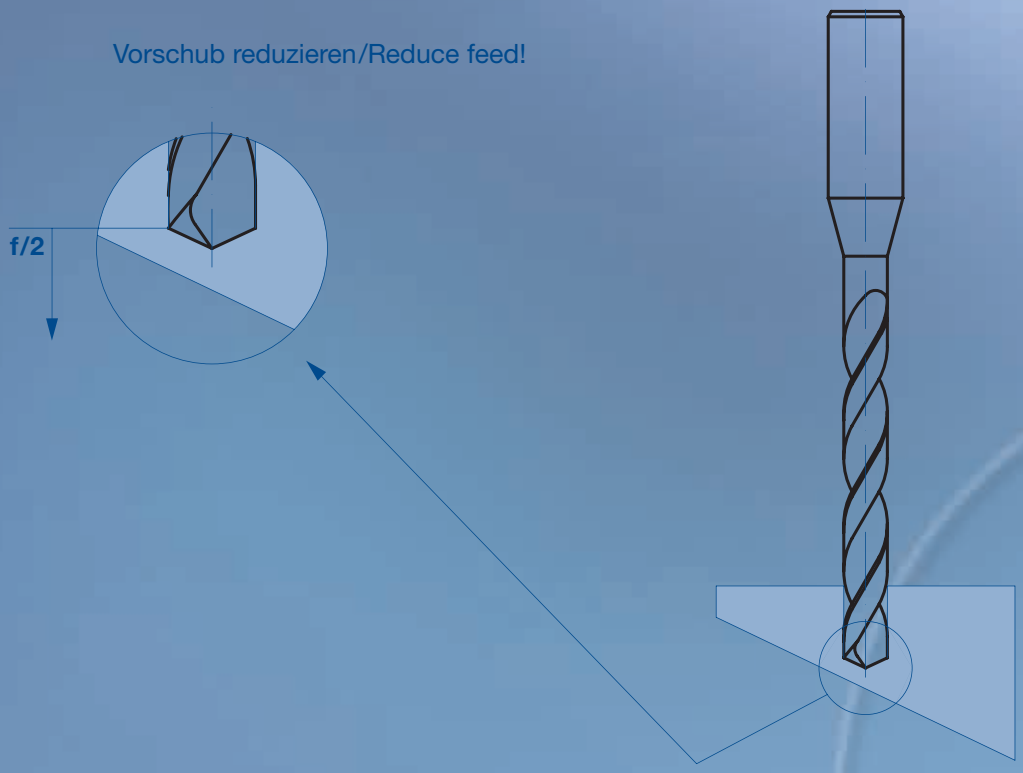
Fräsen einer Fläche/
Milling a flat



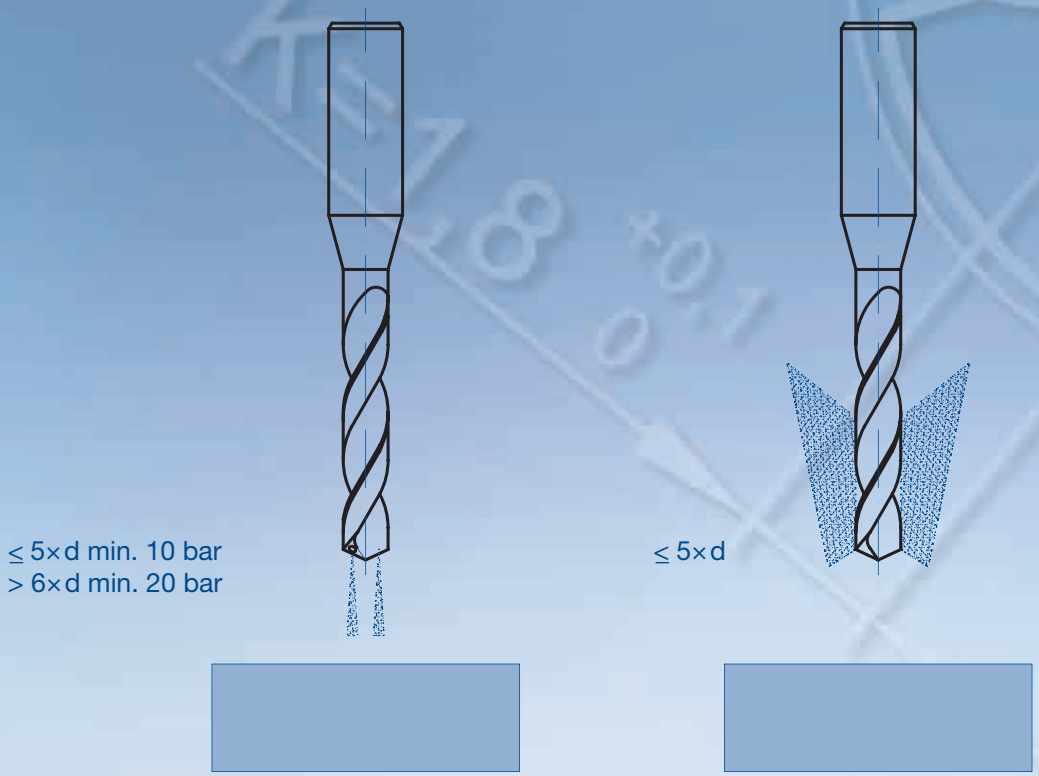
Bohreraustritt und Kühlung
Drill exit and cooling

Bohreraustritt in schräger Fläche/Drill exit in an inclined surface

Vorschub reduzieren/Reduce feed!

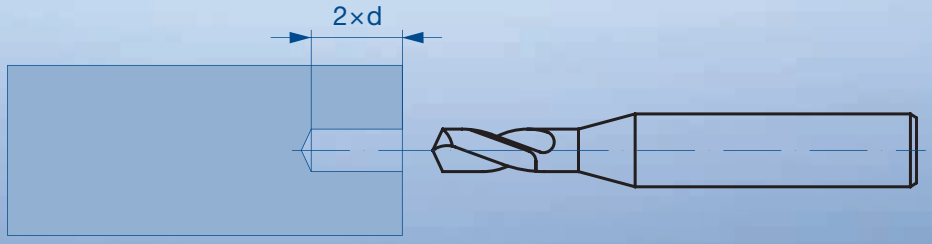


Kühlung/Cooling



Bearbeitungsverfahren Tieflochbohren Schritt für Schritt

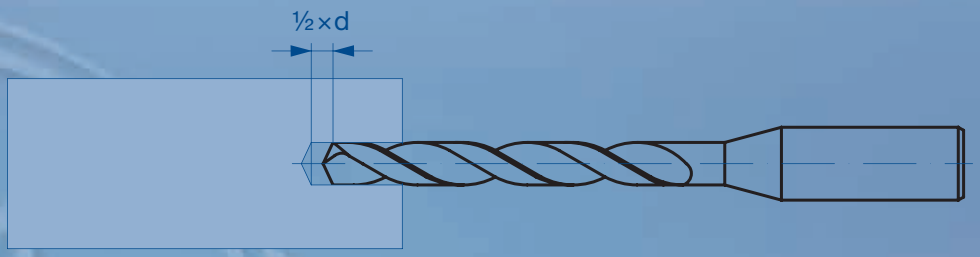
Machining process deep-hole drilling, step by step



< ø 3.00 mm Art. 56033
≥ ø 3.00 mm Art. 50950

1. Pilotloch bohren

1. Pilothole drilling



n = max. 500 min^{-1}
v_f = 25 %

2. Phoenix Bohrer bei langsamdrehender Spindel einführen.

2. Insert the Phoenix drill with reduced rpm into the pilothole.

v_f = 100 %
v_c = 100 %

3. Spindeldrehzahl auf Nennwert, Kühlmittel in Betrieb setzen, ohne entspänen auf gewünschte Tiefe bohren.

3. Increase the rpm to the nominal value and switch ON the coolant, drilling full depth without pecking cycle.

n = max. 500 min^{-1}
v_f = 25 %

4. Nach Erreichen der gewünschten Tiefe die Spindeldrehzahl reduzieren, Kühlmittel ausschalten und Bohrer herausziehen.

4. After reaching the required drilling depth, reduce the spindle speed, switch OFF the coolant and retract the drill.

Allgemeine Verkaufsbedingungen

Geltungsbereich
Für Bestellungen gelten ausschliesslich nachfolgende Bedingungen. Abweichende oder zusätzliche Bedingungen, insbesondere auch allg. Einkaufsbedingungen der Kunden gelten nur, wenn sie schriftlich vereinbart wurden.

Preise
In Schweizerfranken und pro Stück, ohne MwSt. und Verpackung.

Lieferfrist
Die Auslieferung erfolgt ab Lager oder bei nicht auf Lager gehaltenen Artikeln gemäss Auftragsbestätigung. Eine ausnahmsweise Nichteinhaltung der Lieferfrist unsererseits berechtigt nicht zur Annullation des Auftrages resp. Schadenersatzansprüchen.

Versand / Transport
Ab Werk Derendingen unverpackt, auf Rechnung und Gefahr des Empfängers. Auf Wunsch decken wir die Transportversicherung zu Lasten des Empfängers.

Mengentoleranzen
Mengentoleranzen bei Bestellmenge von
< 20 Stück = ± 2 Stück
≥ 20 Stück = ± 10 %
bleiben bei Sonderanfertigungen vorbehalten.
Die Verrechnung dieser Mehr- oder Mindermengen erfolgt auf Basis des für den Auftrag abgeschlossenen Preises.

Eigentumsvorbehalt
Die gelieferte Ware bleibt bis zu ihrer vollständigen Bezahlung Eigentum der Sphinx Werkzeuge AG.

Reklamationen
Müssen innerhalb 8 Tagen nach Empfang der Ware schriftlich erfolgen. Fehlerhafte Werkzeuge werden nach unserer Wahl ersetzt oder gutgeschrieben. Weitergehende Schadenersatzansprüche lehnen wir ab.

Zahlung
Falls nicht anders vereinbart, gilt 30 Tage netto. Der Mindestfakturbetrag ist CHF 50.– pro Bestellung. Bestellungen unter CHF 100.– ohne Rabatt.

Besondere Bestimmungen
Zeichnungen: Für Sphinx Katalogartikel liegt die Designverantwortung bei Sphinx. Für Sonderwerkzeuge, insbesondere für Medizinwerkzeuge liegt die Designverantwortung bei unseren Kunden.

Änderungen
Technische Änderungen unserer Produkte im Zuge der Weiterentwicklung behalten wir uns vor.
Bei Sonderanfertigungen erfolgen Aenderungsmitteilungen durch die Kunden, ansonsten wird nach dem letzten Zeichnungsstand gefertigt. Aenderungen können kostenbeeinflussend wirken.

Rückverfolgbarkeit
Wo nichts anderes vereinbart wird, erfolgt die Rückverfolgbarkeit über unsere Artikel- und Fabrikations-Auftrags-System Nummer.

Anwendbares Recht
Anwendbar ist das schweizerische Recht.
Gerichtsstand ist Solothurn.

Conditions de vente générales

Domaine d'application
Les conditions ci-après sont uniquement valables pour les commandes. Les exceptions ou suppléments des conditions générales de vente, en particulier les conditions générales des clients, sont uniquement valable par convention écrite.

Prix
En francs suisses et par pièce sans TVA et emballage.

Délai de livrasion
En général du stock, sinon pour les articles non-stockés selon le délai confirmé. Si exceptionnellement nous ne pouvons respecter le délai confirmé, ceci n'autorise pas l'annulation de la commande ni dédommagement.

Expédition / Transport
Départ d'usine Derendingen sans emballage, aux risques et frais du client. Sur demande nous vous offrons l'assurance de transport aux prix de revient.

Tolérances de quantité
Toute commande nécessitant une exécution spéciale sera considérée comme étant soldée, selon le résultat de la fabrication à
< 20 pièces = ± 2 pièces
≥ 20 pièces = ± 10 %
de la quantité commandée.
La facturation de ces quantités à plus ou mois est sur la base des prix valables pour cette commande.

Réserve de propriété
La marchandise livrée reste la propriété de la Sphinx Outils SA jusqu'à son paiement intégral.

Réclamations
Elles doivent nous parvenir par écrit dans les 8 jours après réception de la marchandise. Les outils défectueux seront remplacés ou crédités suivant notre option. Toute autre revendications ne pourront être prises en considération.

Paiement
30 jours net en francs suisses sauf autre convention.
La facturation minimale est de CHF 50.–. Commandes au-dessous de CHF 100.– sans rabais.

Dispositions spéciales
Dessins: chez Sphinx Outils SA, les outils présentés dans le catalogue sont totalement développés par notre département technique et nous en prenons la responsabilité.
Pour les outils spéciaux, en particulier, les outils médicaux, le client porte la responsabilité du développement technique.

Modifications
Nous nous réservons le droit de procéder aux modifications techniques de nos produits à l'occasion de perfectionnements.
Pour les exécutions spéciales, les modifications nous parviennent par le client, sinon la fabrication s'effectue d'après les derniers dessins. Des modifications peuvent entraîner des frais.

Recherche
Sans autre convention, la recherche est par notre numéro d'article et de fabrication.

Droit applicable
Le droit suisse est applicable.
Lieu de juridiction: Soleure

Condizioni generali di vendita

Ambito di applicazione
Per tutti gli ordini prevenuti sono valide solo le seguenti condizioni. Eccezioni o modifiche alle condizioni generali della vendita, in particolare condizioni specifiche dei clienti, sono valide solo se concordate per iscritto.

Prezzi
In franchi svizzeri e per unità, IVA ed imballaggio non compresi.

Tempi di consegna
La consegna avviene dallo stock, e per gli articoli non disponibili a magazzino, secondo quanto indicato nella conferma d'ordine. Eventuali inosservanze dei termini di consegna non autorizzano l'annullamento dell'ordine o diritto al risarcimento del danno.

Spedizione / Trasporto
Franco partenza dalla fabbrica a Derendingen, imballo non compreso, a spese e rischio del cliente. A richiesta, offriamo l'assicurazione del trasporto al prezzo di costo.

Toleranza sulla quantità
Tutti gli ordini che prevedono un'esecuzione speciale risulteranno saldati sulla base di quanto uscito dalla fabbricazione, ossia
< 20 pezzi = ± 2 pezzi
≥ 20 pezzi = ± 10 %
in più o in meno dalla quantità ordinata.
La fatturazione di queste quantità in più o meno avvera sulla base del prezzo stabilito nell'ordine.

Riserva della proprietà
La Sphinx Utensili Spa si riserva la piena proprietà della merce fornita sino al completo pagamento della stessa.

Reclamazioni
Devono essere presentate scritte entro 8 giorni dopo il ricevimento della merce. Utensili difettosi verranno sostituiti o accreditati a nostra scelta. Non vengono prese in considerazioni ulteriori pretese di risarcimento.

Pagamento
Se non concordato diversamente, s'intende a 30 giorni netto. Il fatturato minimo é di CHF 50.–. Per ordini inferiori a CHF 100.– senza sconto.

Disposizioni particolari
Disegni: per gli articoli del catalogo Sphinx la responsabilità del design spetta alla dittta Sphinx. Per utensili speciali, in particolare per gli utensili medicali la responsabilità é del cliente.

Modifiche
Con riserva di modifiche tecniche nel quadro dello sviluppo ulteriore del prodotto.
Per esecuzioni speciali, le eventuali modifiche devono pervenire dal cliente, altrimenti la fabbricazione viene effettuata secondo gli ultimi disegni. Le modifiche possono comportare dei costi supplementari

Rintracciabilità
In assenza di particolari accordi, la ricerca avviene con il numero d'articolo Sphinx e del lotto di fabbricazione.

Controversie
Per ogni controversia si applica il diritto svizzero.
Luogo di competenza: Soletta.

General Terms

Validity
The terms mentioned hereafter are valid for all orders. Any purchasing or other terms from our partners are waved if not expressly agreed in writing.

Prices
Are given in Swiss Francs per piece, ex works. Packing and transport not included.

Delivery
For catalog items ex stock or as per our acknowledgement. If a confirmed delivery date is late, the seller cannot be held responsible for any subsequent costs nor cancellation.

Shipment / Transport
Ex our works Derendingen, unpacked at buyers risk and peril. On request we cover transport insurance at customers costs.

Quantity tolerances
For manufacturing orders of special executions, a quantity tolerance of
< 20 pieces = ± 2 pieces
≥ 20 pieces = ± 10 %
will be reserved.
Invoicing of such over-/ under-deliveries is based on the agreed price for the original order.

Reservation of title
The goods delivered shall remain the property of Sphinx Tools Ltd. until they have been paid for in full.

Complaints
Have to be made in writing at latest 8 days after receipt of goods. We either replace or credit any faulty tool at our choice. We do not accept any further liability.

Payments
If not agreed otherwise, terms are 30 days net in Swiss Francs. Minimum amount per order is CHF 50.–. Order below CHF 100.– without discount.

Special Terms
Drawings: For catalog items as per SPHINX specification. For any specials and all medical tools, responsibility for design is with purchaser.

Alterations
We reserve the right to make technical alterations to our products as part of their development.
For special tools we manufacture to latest drawing in our possession. Any subsequent alterations are made at customers costs.

Retraceability
Subject to other agreements, the retraceability is as per our article and manufacturing number system.

Place of arbitration
For all commitments Swiss law is applied at Solothurn.

Produkteübersicht
Gamme d'outils
Programma di fabbricazione
Product overview

Die Fertigungsstätten in Derendingen und Porrentruy, eine Referenz für «Made in Switzerland».
Les ateliers de fabrication à Derendingen et Porrentruy, une référence «Made in Switzerland».
Gli stabilimenti di produzione a Derendingen e Porrentruy, una referenza di «Made in Switzerland».
Production facilities in Derendingen and Porrentruy, a reference for «Made in Switzerland».

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