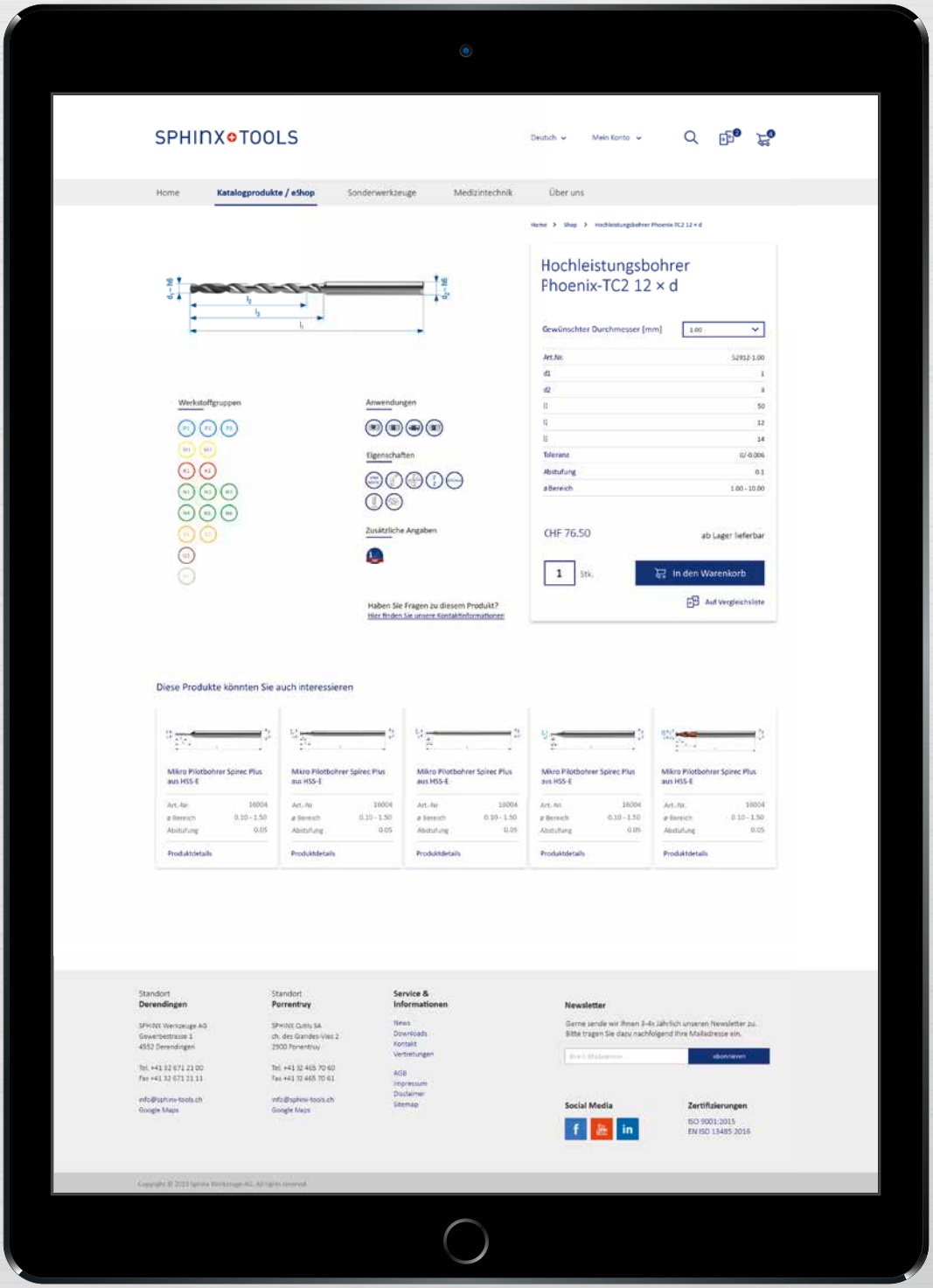
Dank unseres E-Shops können Sie sich unsere Produkte online ansehen und direkt bestellen.
Grâce à notre E-Shop vous avez la possibilité de consulter et commander nos produits en ligne.
Grazie al nostro E-Shop avete la possibilità di guardare ed ordinare i nostri prodotti online.
Thanks to our E-Shop you can have a look at our tools online and place an order directly.



swiss made by SPHINX TOOLS

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 SpA 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.

SELLMX TOOLS

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Bohren und Reiben
Perçage et alésage
Forare ed alesare
Drilling and reaming

	Artikel Article	Durchmesserbereich Diameter range	Abstufung Incre-ments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
NC-Anbohrer **Foret à pointer NC**						
	50806	0.50–6.00	0.10		60°	20°
	50809	0.50–3.00	0.10		90°	20°
	50808	0.50–3.00	0.10		90°	20°
	50810	2.00–20.00	1.00		90°	20°
	50811	2.00–12.00	1.00		90°	20°
	50812	2.00–20.00	1.00		123°	20°
	50813	2.00–10.00	1.00		123°	20°
	50814	2.00–20.00	1.00		142°	20°
	50815	2.00–10.00	1.00		142°	20°
	50818	1.60–12.00	0.20		142°/90°	20°
Pilotbohrer **Foret de préperçage**						
	56005	0.10–1.50	0.01	2–4×ø	130°	20°
	56033	0.03–2.99	0.01	2×ø	130°	30°
	56036	0.30–6.00	0.05	2×ø	140°/90°	30°
	16004	0.10–1.50	0.05	2–3×ø	130°	20°
Mikrobohrer **Micro foret**						
	50695	0.20–1.50	0.01	6×ø	118°	30°
	50699	0.05–2.00	0.01	6×ø	118°	30°

* S. 142 + 143
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✓ hervorragend / excellent / ottimamente / outstanding
• geeignet / approprié / adatto / suitable

Material	Werkstoffgruppe * Workpiece material * P	M	K	N	S	H	O	Anwendung * Application *	Seite Page
Punta a centrare NC NC spotting drill									
VHM / MD / SC	✓	✓	✓	✓	•		✓		12
VHM / MD / SC	✓	✓	✓	✓	•		✓		13
VHM / MD / SC, TiAlSiN	✓	✓	✓	✓	✓	✓	✓		14
VHM / MD / SC	✓	✓	✓	✓	•		✓		15
VHM / MD / SC; TiAlSiN	✓	✓	✓	✓	•	✓	✓		16
VHM / MD / SC	✓	✓	✓	✓	•		✓		17
VHM / MD / SC; TiAlSiN	✓	✓	✓	✓	•	✓	✓		18
VHM / MD / SC	✓	✓	✓	✓	•		✓		19
VHM / MD / SC; TiAlSiN	✓	✓	✓	✓	•	✓	✓		20
VHM / MD / SC	✓	✓	✓	✓	•		✓		21
Punta per preforo Pilot drill									
VHM / MD / SC	✓	•	✓	✓	✓		✓		22
VHM / MD / SC	✓	✓	✓	✓	✓		✓		23
VHM / MD / SC; AlCrN	✓	✓	✓	✓	✓	•	•		25
HSS-E	✓	•	✓	•			•		26
Micro punta Micro drill									
VHM / MD / SC	✓	•	✓	✓			•		27
VHM / MD / SC	✓	•	✓	✓			•		28

	Artikel Article	Durchmesserbereich Diameter range	Abstufung Incre-ments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
	51200	0.03–3.00	0.01	6×ø	130°	35°
	51201	0.20–3.00	0.01	6×ø	130°	35°
	50621	0.15–3.00	0.01	12×ø	130°	25°
	50622	0.20–3.00	0.01	12×ø	130°	25°
	12604	0.05–3.175	0.01	DIN 1899-A	118°	25°
Mikro-Tieflochbohrer **Micro foret de perçage profond**						
	50720	0.20–2.00	0.05	20×ø	129°	30°
	50740	0.40–1.50	0.05	40×ø	126°	30°
	50760	0.40–1.50	0.05	60×ø	126°	30°
	50780	0.40–1.50	0.05	80×ø	126°	30°
Hochleistungsbohrer Nirox **Foret à grand rendement Nirox**						
	51609	0.30–3.00	0.05	9×ø	140°	28°
Hochleistungsbohrer Phoenix TC2 **Foret à grand rendement Phoenix TC2**						
	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°

* S. 142 + 143
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Material	Werkstoffgruppe * Workpiece material *							Anwendung * Application *	Seite Page
	P	M	K	N	S	H	O		
VHM / MD / SC	✓	✓	✓	✓	✓		•		30
VHM / MD / SC; TiAlN	✓	✓	✓	✓	✓	•	•		32
VHM / MD / SC	✓	•	✓	✓			•		34
VHM / MD / SC; TiAlN	✓	•	✓	✓	•	•	•		36
HSS-E	✓	•	✓	•			•		38
Micro punta per foro profondo Micro deep hole drill									
VHM / MD / SC; Mi-Nova	✓	•	✓	✓	•	•	✓		39
VHM / MD / SC; Mi-Nova	✓	•	✓	✓	•	•	✓		40
VHM / MD / SC; Mi-Nova	✓	•	✓	✓	•	•	✓		41
VHM / MD / SC; Mi-Nova	✓	•	✓	✓	•	•	✓		42
Punta ad alto rendimento Nirox High performance drill Nirox									
VHM / MD / SC; TiAlSiN	✓	✓	•	•	✓	•	✓		43
Punta ad alto rendimento Phoenix TC2 High performance drill Phoenix TC2									
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		44
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		45
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	•		46
VHM / MD / SC; AlCrTiN	✓	✓	✓	✓	✓	•	•		47
VHM / MD / SC; AlCrTiN	✓	✓	•	✓	✓	•	•		48
VHM / MD / SC; AlCrTiN	•	✓	•	✓	✓	•	•		49
VHM / MD / SC; AlCrTiN	•	✓	•	✓	✓	•	•		50

	Artikel Article	Durchmesserbereich Diameter range	Abstufung Incre-ments	Bohrtiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle
Hochleistungsbohrer Phoenix **Foret à grand rendement Phoenix**						
	50938	1.00 – 12.70	0.10	3 × ø	140°	30°
	50940	1.00 – 12.70	0.05	6 × ø	140°	30°
	50941	0.50 – 3.00	0.10	6 × ø	140°	30°
Hochleistungsbohrer Quadro **Foret à grand rendement Quadro**						
	52100	3.00 – 19.50	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°
Spiralbohrer **Foret hélicoïdal**						
	50950	3.00 – 20.00	0.10	DIN 6537	140°	30°
	50830	0.30 – 20.00	0.10	DIN 6539	118°	35°
	50838	0.30 – 6.00	0.05	3 – 8 × ø	118°	30°
	50820	0.70 – 14.00	0.10	DIN 338	130°	35° – 15°
Bohrreibahlen **Foret alésoir**						
	50840	2.00 – 14.00	0.10	DIN 6539	118°	35°
	55654	1.00 – 14.00	0.10	DIN 6539	140°	35°
	55338	1.00 – 14.00	0.10	DIN 338	140°	35°
	55652	0.20 – 2.99	0.01	5 × ø	140°	35°
Reibahlen **Alésoir**						
	58000	0.987 – 6.018	0.01	– 8 × ø		10°
	58500	0.987 – 6.018	0.01	– 8 × ø		10°

* S. 142 + 143
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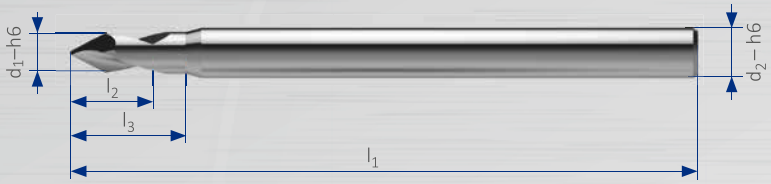
• geeignet / approprié / adatto / suitable

Material	Werkstoffgruppe * Workpiece material *							Anwendung * Application *	Seite Page
	P	M	K	N	S	H	O		
Punta ad alto rendimento Phoenix **High performance drill Phoenix**									
VHM / MD / SC; AlCrN	✓	✓	✓	•	•	•			51
VHM / MD / SC; TiAlN	✓	✓	✓	•	•	•			52
VHM / MD / SC; TiAlN	✓	✓	✓	•	•	•			54
Punta ad alto rendimento Quadro **High performance drill Quadro**									
VHM / MD / SC			✓	✓			•		55
VHM / MD / SC			✓	✓			•		56
VHM / MD / SC; TiAlN	✓		✓	✓		•			57
Punta elicoidale **Twist drill**									
VHM / MD / SC; TiAlN	✓	•	✓	•	•	•	•		58
VHM / MD / SC	✓	✓	•	✓	•		✓		59
VHM / MD / SC	✓	✓	•	✓	•		✓		60
VHM / MD / SC	✓		✓	•					61
Punta alesatore **Drill reamer**									
VHM / MD / SC	•	•	•	✓	•				62
VHM / MD / SC	✓	•	✓	•	•				63
VHM / MD / SC	✓	•	✓	•	•				64
VHM / MD / SC	✓	•	✓	•	•		•		65
Alesatore **Reamer**									
VHM / MD / SC	✓	✓	✓	✓	•				67
VHM / MD / SC	✓	✓	✓	✓	•				68

NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50806

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 2

i 115

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

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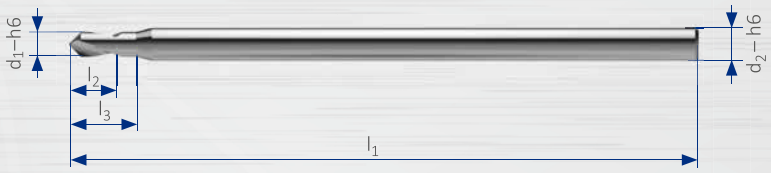
NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50809

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 2

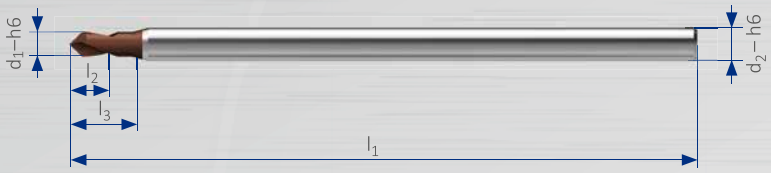
i 115

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

NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50808

P1–3 M1,2 K1,2 N1–8 S1 H1 O1,2



VHM MD/SC

TiAlSiN

Z 2

90°

20°

115

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

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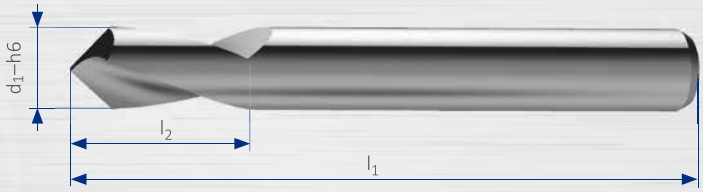
NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50810

P1–3 M1,2 K1,2 N1–8 O1



VHM MD/SC

Z 2

90° 20°

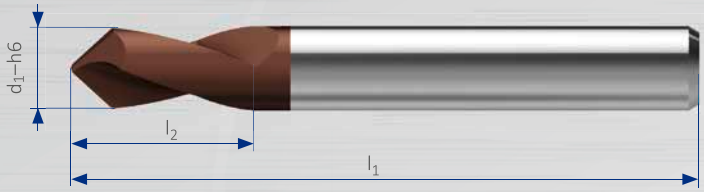
116

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
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50811

P1–3 M1,2 K1,2 N1–8 S1 H1 O1,2



VHM MD/SC

TiAlSiN

Z 2

90°

20°

116

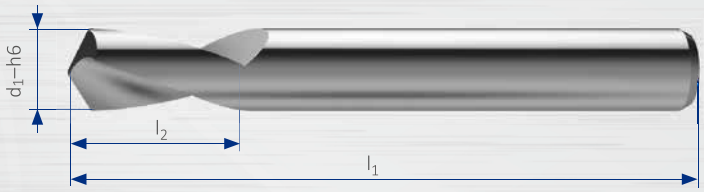
d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70
12.00	22.00	70

swiss made by SPHINX TOOLS

NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50812

P1–3 M1,2 K1,2 N1–8 O1



VHM MD/SC

Z 2

123°

20°

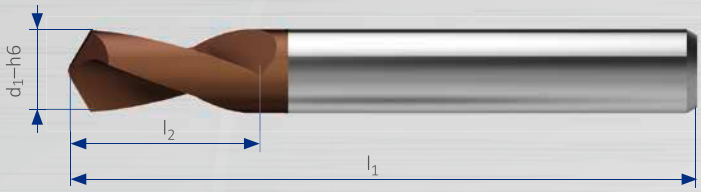
116

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
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50813

P1–3 M1,2 K1,2 N1–8 S1 H1 O1,2



VHM MD/SC | TiAlSiN | Z 2 | 123° | 20°

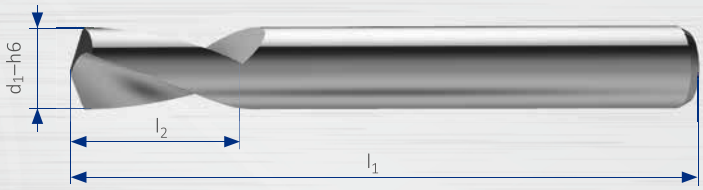
116

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

NC-Anbohrer
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50814

P1–3 M1,2 K1,2 N1–8 O1



VHM MD/SC

Z 2

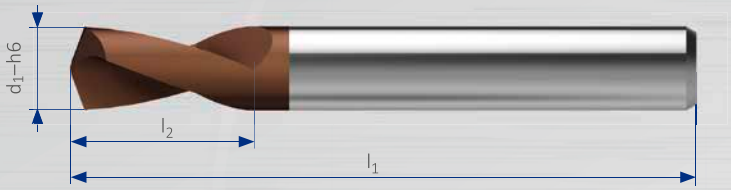
i 116

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
Foret à pointer NC
Punta a centrare NC
NC spotting drill

Art. 50815

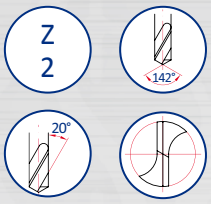
P1–3 M1,2 K1,2 N1–8 S1 H1 O1,2



VHM MD/SC

TiAlSiN

Z 2



i 116

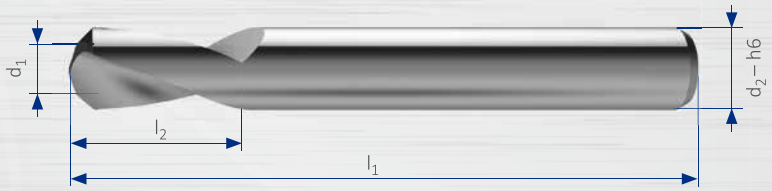
d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70

swiss made by SPHINX TOOLS

Zentriersenker
Foret à pointer et chanfreiner
Punta da centro e smusso
Spotting and chamfering drill

Art. 50818

P1–3 M1,2 K1,2 N1–8 O1



VHM MD/SC

Z 2

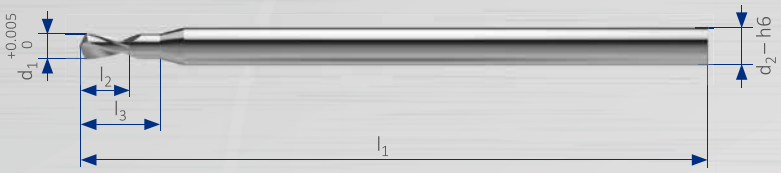
i 116

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
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
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

Pilotbohrer
Foret de préperçage
Punta per preforo
Pilot drill

Art. 56005

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

d1 + 0.005 0

Z 2

130°

20°

2–4xd

117

10

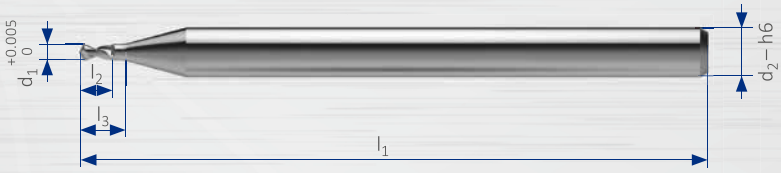
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.10	0.40	0.60	25	1.50
0.15	0.40	0.60	25	1.50
0.20	0.60	0.90	25	1.50
0.25	0.60	0.90	25	1.50
0.30	0.90	1.20	25	1.50
0.35	0.90	1.20	25	1.50
0.40	0.90	1.60	25	1.50
0.45	0.90	1.60	25	1.50
0.50	1.00	1.80	25	1.50
0.55	1.00	1.80	25	1.50
0.60	1.20	2.00	25	1.50
0.65	1.20	2.00	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

swiss made by SPHINX TOOLS

Pilotbohrer
Foret de préperçage
Punta per preforo
Pilot drill

Art. 56033

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

d1 + 0.005 0

Z 2

130°

30°

2×d

117

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.03	0.15	0.30	38	3.00	0.41	0.82	1.60	38	3.00	0.79	1.58	2.30	38	3.00	1.17	2.34	3.80	38	3.00
0.04	0.15	0.30	38	3.00	0.42	0.84	1.60	38	3.00	0.80	1.60	2.30	38	3.00	1.18	2.36	3.80	38	3.00
0.05	0.20	0.40	38	3.00	0.43	0.86	1.60	38	3.00	0.81	1.62	2.40	38	3.00	1.19	2.38	3.80	38	3.00
0.06	0.20	0.40	38	3.00	0.44	0.88	1.60	38	3.00	0.82	1.64	2.40	38	3.00	1.20	2.40	3.80	38	3.00
0.07	0.25	0.45	38	3.00	0.45	0.90	1.60	38	3.00	0.83	1.66	2.40	38	3.00	1.21	2.42	4.20	38	3.00
0.08	0.25	0.45	38	3.00	0.46	0.92	1.70	38	3.00	0.84	1.68	2.40	38	3.00	1.22	2.44	4.20	38	3.00
0.09	0.30	0.50	38	3.00	0.47	0.94	1.70	38	3.00	0.85	1.70	2.40	38	3.00	1.23	2.46	4.20	38	3.00
0.10	0.35	0.55	38	3.00	0.48	0.96	1.70	38	3.00	0.86	1.72	2.50	38	3.00	1.24	2.48	4.20	38	3.00
0.11	0.35	0.55	38	3.00	0.49	0.98	1.70	38	3.00	0.87	1.74	2.50	38	3.00	1.25	2.50	4.20	38	3.00
0.12	0.35	0.55	38	3.00	0.50	1.00	1.70	38	3.00	0.88	1.76	2.50	38	3.00	1.26	2.52	4.30	38	3.00
0.13	0.40	0.60	38	3.00	0.51	1.02	1.80	38	3.00	0.89	1.78	2.50	38	3.00	1.27	2.54	4.30	38	3.00
0.14	0.40	0.60	38	3.00	0.52	1.04	1.80	38	3.00	0.90	1.80	2.50	38	3.00	1.28	2.56	4.30	38	3.00
0.15	0.40	0.60	38	3.00	0.53	1.06	1.80	38	3.00	0.91	1.82	2.60	38	3.00	1.29	2.58	4.30	38	3.00
0.16	0.40	0.60	38	3.00	0.54	1.08	1.80	38	3.00	0.92	1.84	2.60	38	3.00	1.30	2.60	4.30	38	3.00
0.17	0.50	0.70	38	3.00	0.55	1.10	1.80	38	3.00	0.93	1.86	2.60	38	3.00	1.31	2.62	4.40	38	3.00
0.18	0.50	0.70	38	3.00	0.56	1.12	1.90	38	3.00	0.94	1.88	2.60	38	3.00	1.32	2.64	4.40	38	3.00
0.19	0.50	0.70	38	3.00	0.57	1.14	1.90	38	3.00	0.95	1.90	2.60	38	3.00	1.33	2.66	4.40	38	3.00
0.20	0.55	0.75	38	3.00	0.58	1.16	1.90	38	3.00	0.96	1.92	2.70	38	3.00	1.34	2.68	4.40	38	3.00
0.21	0.55	0.75	38	3.00	0.59	1.18	1.90	38	3.00	0.97	1.94	2.70	38	3.00	1.35	2.70	4.40	38	3.00
0.22	0.60	0.80	38	3.00	0.60	1.20	1.90	38	3.00	0.98	1.96	2.70	38	3.00	1.36	2.72	4.50	38	3.00
0.23	0.60	0.80	38	3.00	0.61	1.22	2.00	38	3.00	0.99	1.98	2.70	38	3.00	1.37	2.74	4.50	38	3.00
0.24	0.60	0.80	38	3.00	0.62	1.24	2.00	38	3.00	1.00	2.00	2.70	38	3.00	1.38	2.76	4.50	38	3.00
0.25	0.70	0.90	38	3.00	0.63	1.26	2.00	38	3.00	1.01	2.02	3.50	38	3.00	1.39	2.78	4.50	38	3.00
0.26	0.70	0.90	38	3.00	0.64	1.28	2.00	38	3.00	1.02	2.04	3.50	38	3.00	1.40	2.80	4.50	38	3.00
0.27	0.70	0.90	38	3.00	0.65	1.30	2.00	38	3.00	1.03	2.06	3.50	38	3.00	1.41	2.82	4.60	38	3.00
0.28	0.80	1.00	38	3.00	0.66	1.32	2.10	38	3.00	1.04	2.08	3.50	38	3.00	1.42	2.84	4.60	38	3.00
0.29	0.80	1.00	38	3.00	0.67	1.34	2.10	38	3.00	1.05	2.10	3.50	38	3.00	1.43	2.86	4.60	38	3.00
0.30	0.90	1.20	38	3.00	0.68	1.36	2.10	38	3.00	1.06	2.12	3.60	38	3.00	1.44	2.88	4.60	38	3.00
0.31	0.90	1.20	38	3.00	0.69	1.38	2.10	38	3.00	1.07	2.14	3.60	38	3.00	1.45	2.90	4.60	38	3.00
0.32	0.90	1.20	38	3.00	0.70	1.40	2.10	38	3.00	1.08	2.16	3.60	38	3.00	1.46	2.92	4.70	38	3.00
0.33	0.90	1.20	38	3.00	0.71	1.42	2.20	38	3.00	1.09	2.18	3.60	38	3.00	1.47	2.94	4.70	38	3.00
0.34	0.90	1.35	38	3.00	0.72	1.44	2.20	38	3.00	1.10	2.20	3.60	38	3.00	1.48	2.96	4.70	38	3.00
0.35	0.90	1.35	38	3.00	0.73	1.46	2.20	38	3.00	1.11	2.22	3.70	38	3.00	1.49	2.98	4.70	38	3.00
0.36	0.95	1.35	38	3.00	0.74	1.48	2.20	38	3.00	1.12	2.24	3.70	38	3.00	1.50	3.00	4.70	38	3.00
0.37	0.95	1.35	38	3.00	0.75	1.50	2.20	38	3.00	1.13	2.26	3.70	38	3.00	1.51	3.02	5.10	38	3.00
0.38	0.95	1.50	38	3.00	0.76	1.52	2.30	38	3.00	1.14	2.28	3.70	38	3.00	1.52	3.04	5.10	38	3.00
0.39	0.95	1.50	38	3.00	0.77	1.54	2.30	38	3.00	1.15	2.30	3.70	38	3.00	1.53	3.06	5.10	38	3.00
0.40	0.80	1.60	38	3.00	0.78	1.56	2.30	38	3.00	1.16	2.32	3.80	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
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
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
1.91	3.82	5.90	38	3.00
1.92	3.84	5.90	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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
2.01	4.02	6.10	38	3.00
2.02	4.04	6.10	38	3.00
2.03	4.06	6.10	38	3.00
2.04	4.08	6.10	38	3.00
2.05	4.10	6.10	38	3.00
2.06	4.12	6.20	38	3.00
2.07	4.14	6.20	38	3.00
2.08	4.16	6.20	38	3.00
2.09	4.18	6.20	38	3.00
2.10	4.20	6.20	38	3.00
2.11	4.22	6.30	38	3.00
2.12	4.24	6.30	38	3.00
2.13	4.26	6.30	38	3.00
2.14	4.28	6.30	38	3.00
2.15	4.30	6.30	38	3.00
2.16	4.32	6.40	38	3.00
2.17	4.34	6.40	38	3.00
2.18	4.36	6.40	38	3.00
2.19	4.38	6.40	38	3.00
2.20	4.40	6.40	38	3.00
2.21	4.42	6.50	38	3.00
2.22	4.44	6.50	38	3.00
2.23	4.46	6.50	38	3.00
2.24	4.48	6.50	38	3.00
2.25	4.50	6.50	38	3.00
2.26	4.52	6.60	38	3.00
2.27	4.54	6.60	38	3.00
2.28	4.56	6.60	38	3.00
2.29	4.58	6.60	38	3.00
2.30	4.60	6.60	38	3.00

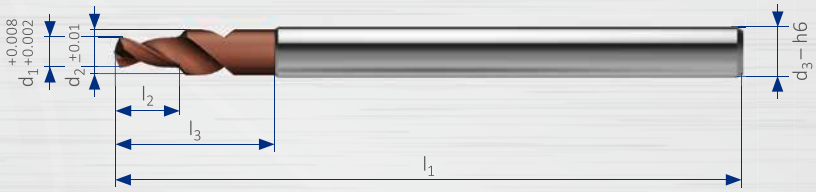
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.31	4.62	6.70	38	3.00
2.32	4.64	6.70	38	3.00
2.33	4.66	6.70	38	3.00
2.34	4.68	6.70	38	3.00
2.35	4.70	6.70	38	3.00
2.36	4.72	6.80	38	3.00
2.37	4.74	6.80	38	3.00
2.38	4.76	6.80	38	3.00
2.39	4.78	6.80	38	3.00
2.40	4.80	6.80	38	3.00
2.41	4.82	6.90	38	3.00
2.42	4.84	6.90	38	3.00
2.43	4.86	6.90	38	3.00
2.44	4.88	6.90	38	3.00
2.45	4.90	6.90	38	3.00
2.46	4.92	7.00	38	3.00
2.47	4.94	7.00	38	3.00
2.48	4.96	7.00	38	3.00
2.49	4.98	7.00	38	3.00
2.50	5.00	7.00	38	3.00
2.51	5.02	7.10	38	3.00
2.52	5.04	7.10	38	3.00
2.53	5.06	7.10	38	3.00
2.54	5.08	7.10	38	3.00
2.55	5.10	7.10	38	3.00
2.56	5.12	7.20	38	3.00
2.57	5.14	7.20	38	3.00
2.58	5.16	7.20	38	3.00
2.59	5.18	7.20	38	3.00
2.60	5.20	7.20	38	3.00
2.61	5.22	7.30	38	3.00
2.62	5.24	7.30	38	3.00
2.63	5.26	7.30	38	3.00
2.64	5.28	7.30	38	3.00
2.65	5.30	7.30	38	3.00
2.66	5.32	7.40	38	3.00
2.67	5.34	7.40	38	3.00
2.68	5.36	7.40	38	3.00

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.69	5.38	7.40	38	3.00
2.70	5.40	7.40	38	3.00
2.71	5.42	7.50	38	3.00
2.72	5.44	7.50	38	3.00
2.73	5.46	7.50	38	3.00
2.74	5.48	7.50	38	3.00
2.75	5.50	7.50	38	3.00
2.76	5.52	7.60	38	3.00
2.77	5.54	7.60	38	3.00
2.78	5.56	7.60	38	3.00
2.79	5.58	7.60	38	3.00
2.80	5.60	7.60	38	3.00
2.81	5.62	7.70	38	3.00
2.82	5.64	7.70	38	3.00
2.83	5.66	7.70	38	3.00
2.84	5.68	7.70	38	3.00
2.85	5.70	7.70	38	3.00
2.86	5.72	7.80	38	3.00
2.87	5.74	7.80	38	3.00
2.88	5.76	7.80	38	3.00
2.89	5.78	7.80	38	3.00
2.90	5.80	7.80	38	3.00
2.91	5.82	7.90	38	3.00
2.92	5.84	7.90	38	3.00
2.93	5.86	7.90	38	3.00
2.94	5.88	7.90	38	3.00
2.95	5.90	7.90	38	3.00
2.96	5.92	8.00	38	3.00
2.97	5.94	8.00	38	3.00
2.98	5.96	8.00	38	3.00
2.99	5.98	8.00	38	3.00

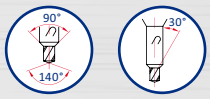
Pilot-Stufenbohrer
Foret étagé de préperçage
Punta a gradino per preforo
Pilot step drill

Art. 56036

P1–3 | M1,2 | K1,2 | N1–5 | S1 | H1



VHM MD/SC | d1 + 0.008 + 0.002 | AlCrN | Z 2



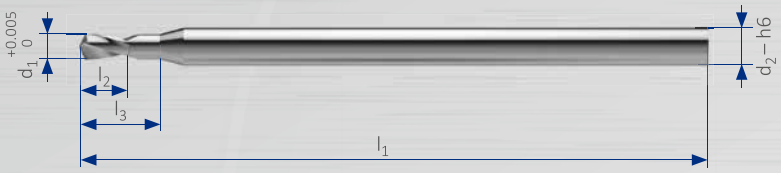
i 118

d_1 mm	d_2 mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm
0.30	0.70	0.60	2.50	50	4.00
0.35	0.70	0.70	2.50	50	4.00
0.40	1.00	0.80	3.00	50	4.00
0.45	1.00	0.90	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
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		50	4.00
2.90	4.00	5.80		50	4.00
2.95	4.00	5.90		50	4.00
3.00	4.00	6.00		50	4.00
3.05	4.60	6.10	14.00	55	6.00
3.10	4.60	6.20	14.50	55	6.00
3.15	4.60	6.30	14.50	55	6.00
3.20	4.60	6.40	14.50	55	6.00
3.25	4.80	6.50	14.50	55	6.00
3.30	4.80	6.60	14.50	55	6.00
3.35	4.80	6.70	15.00	55	6.00
3.40	4.80	6.80	15.00	55	6.00
3.45	5.00	6.90	15.00	55	6.00
3.50	5.00	7.00	15.00	55	6.00
3.55	5.00	7.10	15.50	55	6.00
3.60	5.00	7.20	15.50	55	6.00
3.65	5.20	7.30	15.50	55	6.00
3.70	5.20	7.40	15.50	55	6.00
3.75	5.20	7.50	16.00	55	6.00
3.80	5.20	7.60	16.00	55	6.00
3.85	5.40	7.70	16.00	55	6.00
3.90	5.40	7.80	16.00	55	6.00
3.95	5.40	7.90	16.50	55	6.00
4.00	5.40	8.00	16.50	55	6.00
4.05	5.60	8.10	16.50	55	6.00
4.10	5.60	8.20	16.50	55	6.00
4.15	5.60	8.30	17.00	55	6.00
4.20	5.60	8.40	17.00	55	6.00
4.25	5.80	8.50	17.00	64	8.00
4.30	5.80	8.60	17.00	64	8.00
4.35	5.80	8.70	17.50	64	8.00
4.40	5.80	8.80	17.50	64	8.00
4.45	6.00	8.90	17.50	64	8.00
4.50	6.00	9.00	18.00	64	8.00
4.55	6.00	9.10	18.00	64	8.00
4.60	6.00	9.20	18.00	64	8.00
4.65	6.20	9.30	18.50	64	8.00
4.70	6.20	9.40	18.50	64	8.00
4.75	6.20	9.50	18.50	64	8.00
4.80	6.20	9.60	19.00	64	8.00
4.85	6.40	9.70	19.00	64	8.00
4.90	6.40	9.80	19.00	64	8.00
4.95	6.40	9.90	19.50	64	8.00
5.00	6.40	10.00	19.50	64	8.00
5.05	6.60	10.10	19.50	64	8.00
5.10	6.60	10.20	20.00	64	8.00
5.15	6.60	10.30	20.00	64	8.00
5.20	6.60	10.40	20.00	64	8.00
5.25	6.80	10.50	20.50	64	8.00
5.30	6.80	10.60	20.50	64	8.00
5.35	6.80	10.70	20.50	64	8.00
5.40	6.80	10.80	21.00	64	8.00
5.45	7.00	10.90	21.00	64	8.00
5.50	7.00	11.00	21.00	64	8.00
5.55	7.00	11.10	21.50	64	8.00
5.60	7.00	11.20	21.50	64	8.00
5.65	7.20	11.30	21.50	64	8.00
5.70	7.20	11.40	22.00	64	8.00
5.75	7.20	11.50	22.00	64	8.00
5.80	7.20	11.60	22.00	64	8.00
5.85	7.40	11.70	22.50	64	8.00
5.90	7.40	11.80	22.50	64	8.00
5.95	7.40	11.90	22.50	64	8.00
6.00	7.40	12.00	23.00	64	8.00

Pilotbohrer Spirec
Foret de préperçage Spirec
Punta per preforo Spirec
Pilot drill Spirec

Art. 16004

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



HSS-E

d1 + 0.005 0

Z 2

130°

20°

2–4×d

118

10

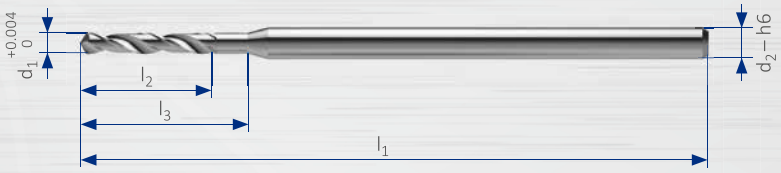
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.10	0.40	0.60	25	1.50
0.15	0.40	0.60	25	1.50
0.20	0.60	0.90	25	1.50
0.25	0.60	0.90	25	1.50
0.30	0.90	1.20	25	1.50
0.35	0.90	1.20	25	1.50
0.40	0.90	1.60	25	1.50
0.45	0.90	1.60	25	1.50
0.50	1.00	1.80	25	1.50
0.55	1.00	1.80	25	1.50
0.60	1.20	2.00	25	1.50
0.65	1.20	2.00	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

swiss made by SPHINX TOOLS

Mikrobohrer Spirec-Plus
Micro foret Spirec-Plus
Micro punta Spirec-Plus
Micro drill Spirec-Plus

Art. 50695

P1–3 | M1 | K1,2 | N2–5 | N7,8



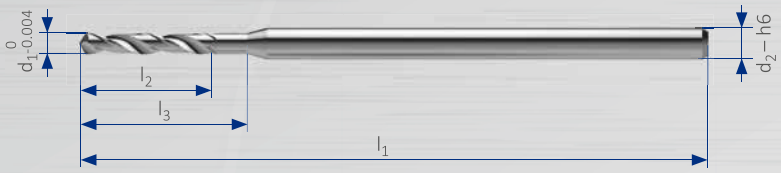
VHM MD/SC | d1 + 0.004 0 | Z 2 | 118° | 30° | 6–8×d | 119 | 10

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
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
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
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
Micro foret Spirec
Micro punta Spirec
Micro drill Spirec

Art. 50699

P1–3 | M1 | K1,2 | N2–5 | N7,8



VHM MD/SC | DIN 1899-A | Z 2 | 118° | 30° | 6–8×d

119 | 10

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

swiss made by SPHINX TOOLS

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

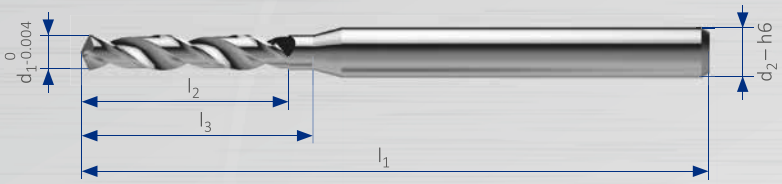
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.81	11.20	13.40	38	2.00
1.82	11.20	13.40	38	2.00
1.83	11.20	13.40	38	2.00
1.84	11.20	13.40	38	2.00
1.85	11.20	13.40	38	2.00
1.86	11.20	13.40	38	2.00
1.87	11.20	13.40	38	2.00
1.88	11.20	13.40	38	2.00
1.89	11.20	13.40	38	2.00
1.90	11.20	13.40	38	2.00
1.91	11.20	13.40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

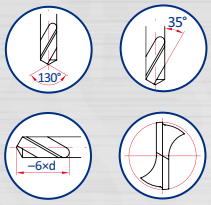
Mikrobohrer
Micro foret
Micro punta
Micro drill

Art. 51200

P1–3 | M1,2 | K1,2 | N1–8 | S1 | O1



VHM MD/SC | Z 2



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

swiss made by SPHINX TOOLS

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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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

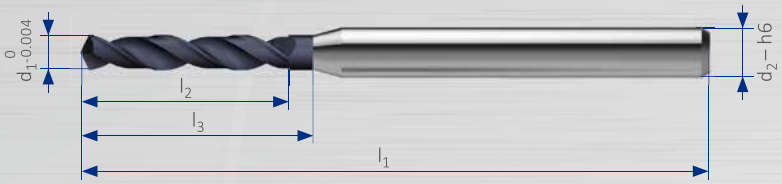
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.31	12.50	14.00	38	3.00
2.32	12.50	14.00	38	3.00
2.33	12.50	14.00	38	3.00
2.34	12.50	14.00	38	3.00
2.35	12.50	14.00	38	3.00
2.36	12.50	14.00	38	3.00
2.37	12.50	14.00	38	3.00
2.38	12.50	14.00	38	3.00
2.39	12.50	14.00	38	3.00
2.40	12.50	14.00	38	3.00
2.41	12.50	14.00	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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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
Micro foret
Micro punta
Micro drill

Art. 51201

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



VHM MD/SC | TiAlN | Z 2 | 130° | 35° | ~6×d | 120

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

swiss made by SPHINX TOOLS

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

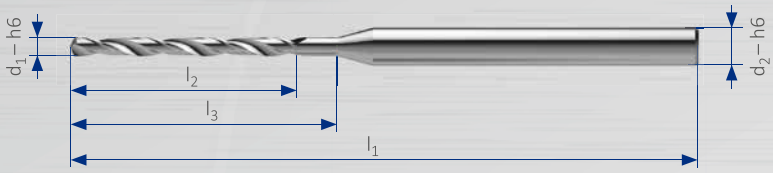
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.40	12.50	14.00	38	3.00
2.41	12.50	14.00	38	3.00
2.42	12.50	14.00	38	3.00
2.43	12.50	14.00	38	3.00
2.44	12.50	14.00	38	3.00
2.45	12.50	14.00	38	3.00
2.46	12.50	14.00	38	3.00
2.47	12.50	14.00	38	3.00
2.48	12.50	14.00	38	3.00
2.49	12.50	14.00	38	3.00
2.50	14.00	17.00	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

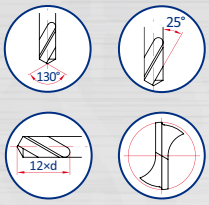
Mikrobohrer
Micro foret
Micro punta
Micro drill

Art. 50621

P1–3 | M1 | K1,2 | N2,3,5



VHM MD/SC | Z 2



i 120

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.15	2.50	3.50	38	3.00	0.53	6.40	7.50	38	3.00	0.91	10.90	12.50	38	3.00	1.29	15.50	18.00	50	3.00
0.16	2.50	3.50	38	3.00	0.54	6.50	7.50	38	3.00	0.92	11.10	13.00	38	3.00	1.30	15.60	18.00	50	3.00
0.17	2.60	3.50	38	3.00	0.55	6.60	7.50	38	3.00	0.93	11.20	13.00	38	3.00	1.31	15.70	18.00	50	3.00
0.18	2.60	3.50	38	3.00	0.56	6.70	8.00	38	3.00	0.94	11.30	13.00	38	3.00	1.32	15.90	18.50	50	3.00
0.19	2.60	3.50	38	3.00	0.57	6.90	8.00	38	3.00	0.95	11.40	13.00	38	3.00	1.33	16.00	18.50	50	3.00
0.20	2.40	3.50	38	3.00	0.58	7.00	8.00	38	3.00	0.96	11.50	13.50	38	3.00	1.34	16.10	18.50	50	3.00
0.21	2.50	3.50	38	3.00	0.59	7.10	8.00	38	3.00	0.97	11.70	13.50	38	3.00	1.35	16.20	18.50	50	3.00
0.22	2.70	3.50	38	3.00	0.60	7.20	9.00	38	3.00	0.98	11.80	13.50	38	3.00	1.36	16.30	19.00	50	3.00
0.23	2.80	3.50	38	3.00	0.61	7.30	9.00	38	3.00	0.99	11.90	13.50	38	3.00	1.37	16.50	19.00	50	3.00
0.24	2.90	4.00	38	3.00	0.62	7.50	9.00	38	3.00	1.00	12.00	14.50	38	3.00	1.38	16.60	19.00	50	3.00
0.25	3.00	4.00	38	3.00	0.63	7.60	9.00	38	3.00	1.01	12.10	14.50	38	3.00	1.39	16.70	19.00	50	3.00
0.26	3.10	4.00	38	3.00	0.64	7.70	9.50	38	3.00	1.02	12.30	14.50	38	3.00	1.40	16.80	19.50	50	3.00
0.27	3.30	4.00	38	3.00	0.65	7.80	9.50	38	3.00	1.03	12.40	14.50	38	3.00	1.41	16.90	19.50	50	3.00
0.28	3.40	4.50	38	3.00	0.66	7.90	9.50	38	3.00	1.04	12.50	15.00	38	3.00	1.42	17.10	19.50	50	3.00
0.29	3.50	4.50	38	3.00	0.67	8.10	9.50	38	3.00	1.05	12.60	15.00	38	3.00	1.43	17.20	19.50	50	3.00
0.30	3.60	4.50	38	3.00	0.68	8.20	10.00	38	3.00	1.06	12.70	15.00	38	3.00	1.44	17.30	20.00	50	3.00
0.31	3.70	4.50	38	3.00	0.69	8.30	10.00	38	3.00	1.07	12.90	15.00	38	3.00	1.45	17.40	20.00	50	3.00
0.32	3.90	5.00	38	3.00	0.70	8.40	10.00	38	3.00	1.08	13.00	15.50	38	3.00	1.46	17.50	20.00	50	3.00
0.33	4.00	5.00	38	3.00	0.71	8.50	10.00	38	3.00	1.09	13.10	15.50	38	3.00	1.47	17.70	20.00	50	3.00
0.34	4.10	5.00	38	3.00	0.72	8.70	10.50	38	3.00	1.10	13.20	15.50	38	3.00	1.48	17.80	20.50	50	3.00
0.35	4.20	5.00	38	3.00	0.73	8.80	10.50	38	3.00	1.11	13.30	15.50	38	3.00	1.49	17.90	20.50	50	3.00
0.36	4.30	5.50	38	3.00	0.74	8.90	10.50	38	3.00	1.12	13.50	16.00	38	3.00	1.50	18.00	21.00	50	3.00
0.37	4.50	5.50	38	3.00	0.75	9.00	10.50	38	3.00	1.13	13.60	16.00	38	3.00	1.51	18.10	21.00	50	3.00
0.38	4.60	5.50	38	3.00	0.76	9.10	11.00	38	3.00	1.14	13.70	16.00	38	3.00	1.52	18.30	21.00	50	3.00
0.39	4.70	5.50	38	3.00	0.77	9.30	11.00	38	3.00	1.15	13.80	16.00	38	3.00	1.53	18.40	21.00	50	3.00
0.40	4.80	6.00	38	3.00	0.78	9.40	11.00	38	3.00	1.16	13.90	16.50	38	3.00	1.54	18.50	21.50	50	3.00
0.41	4.90	6.00	38	3.00	0.79	9.50	11.00	38	3.00	1.17	14.10	16.50	38	3.00	1.55	18.60	21.50	50	3.00
0.42	5.10	6.00	38	3.00	0.80	9.60	11.50	38	3.00	1.18	14.20	16.50	38	3.00	1.56	18.70	21.50	50	3.00
0.43	5.20	6.00	38	3.00	0.81	9.70	11.50	38	3.00	1.19	14.30	16.50	38	3.00	1.57	18.90	21.50	50	3.00
0.44	5.30	6.50	38	3.00	0.82	9.90	11.50	38	3.00	1.20	14.40	17.00	38	3.00	1.58	19.00	22.00	50	3.00
0.45	5.40	6.50	38	3.00	0.83	10.00	11.50	38	3.00	1.21	14.50	17.00	38	3.00	1.59	19.10	22.00	50	3.00
0.46	5.50	6.50	38	3.00	0.84	10.10	12.00	38	3.00	1.22	14.70	17.00	38	3.00	1.60	19.20	22.00	50	3.00
0.47	5.70	6.50	38	3.00	0.85	10.20	12.00	38	3.00	1.23	14.80	17.00	38	3.00	1.61	19.30	22.00	50	3.00
0.48	5.80	7.00	38	3.00	0.86	10.30	12.00	38	3.00	1.24	14.90	17.50	38	3.00	1.62	19.40	22.50	50	3.00
0.49	5.90	7.00	38	3.00	0.87	10.50	12.00	38	3.00	1.25	15.00	17.50	38	3.00	1.63	19.60	22.50	50	3.00
0.50	6.00	7.00	38	3.00	0.88	10.60	12.50	38	3.00	1.26	15.10	17.50	50	3.00	1.64	19.70	22.50	50	3.00
0.51	6.10	7.00	38	3.00	0.89	10.70	12.50	38	3.00	1.27	15.30	17.50	50	3.00	1.65	19.80	22.50	50	3.00
0.52	6.30	7.50	38	3.00	0.90	10.80	12.50	38	3.00	1.28	15.40	18.00	50	3.00	1.66	19.90	23.00	50	3.00

swiss made by SPHINX TOOLS

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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
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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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	25.30	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

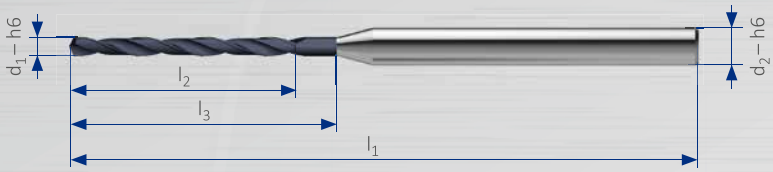
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.35	28.20	31.50	65	3.00
2.36	28.30	31.50	65	3.00
2.37	28.40	32.00	65	3.00
2.38	28.60	32.00	65	3.00
2.39	28.70	32.00	65	3.00
2.40	28.80	32.00	65	3.00
2.41	28.90	33.00	65	3.00
2.42	29.00	33.00	65	3.00
2.43	29.20	33.00	65	3.00
2.44	29.30	33.00	65	3.00
2.45	29.40	33.00	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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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
Micro foret
Micro punta
Micro drill

Art. 50622

P1–3 | M1 | K1,2 | N2,3,5 | H1



VHM MD/SC | TiAlN | Z 2 | 130° | 25° | 12×d

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

swiss made by SPHINX TOOLS

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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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

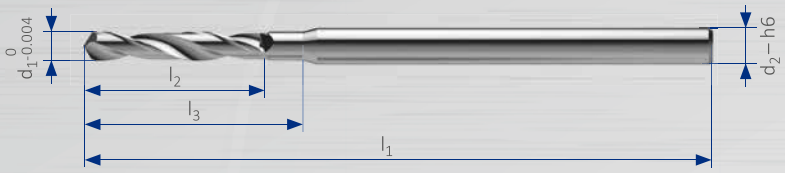
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
2.40	28.80	32.00	65	3.00
2.41	28.90	33.00	65	3.00
2.42	29.00	33.00	65	3.00
2.43	29.20	33.00	65	3.00
2.44	29.30	33.00	65	3.00
2.45	29.40	33.00	65	3.00
2.46	29.50	33.50	65	3.00
2.47	29.60	33.50	65	3.00
2.48	29.80	33.50	65	3.00
2.49	29.90	33.50	65	3.00
2.50	30.00	34.00	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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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 Spirec
Micro foret Spirec
Micro punta Spirec
Micro drill Spirec

Art. 12604

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



HSS-E DIN 1899-A Z 2

121

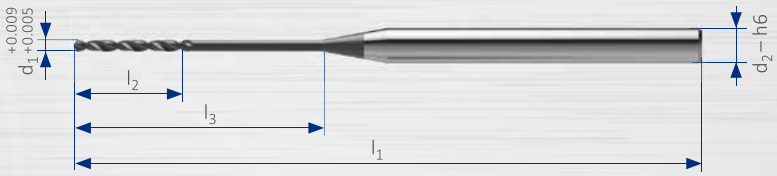
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.05	0.40	0.60	25	1.00
0.06	0.40	0.60	25	1.00
0.07	0.50	0.70	25	1.00
0.08	0.50	0.70	25	1.00
0.09	0.50	0.70	25	1.00
0.10	0.50	0.70	25	1.00
0.11	0.50	0.70	25	1.00
0.12	0.50	0.70	25	1.00
0.13	0.80	1.00	25	1.00
0.14	0.80	1.00	25	1.00
0.15	0.80	1.00	25	1.00
0.16	1.10	1.40	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

swiss made by SPHINX TOOLS

Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50720

P1–3 M1,2 K1,2 N1–6 S1 O1



VHM MD/SC

d1 + 0.009 + 0.005

Mi-Nova

Z 2

129°

30°

10×d

20×d

122

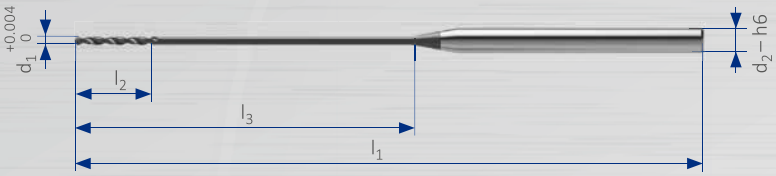
150

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	2.50	4.00	38	3.00
0.25	3.00	5.00	38	3.00
0.30	3.50	6.00	38	3.00
0.35	4.00	7.00	38	3.00
0.40	4.50	8.00	38	3.00
0.45	5.00	9.00	38	3.00
0.50	5.50	10.00	50	3.00
0.55	6.00	11.00	50	3.00
0.60	6.50	12.00	50	3.00
0.65	7.00	13.00	50	3.00
0.70	7.50	14.00	50	3.00
0.75	8.00	15.00	50	3.00
0.80	8.50	16.00	55	3.00
0.85	9.00	17.00	55	3.00
0.90	9.50	18.00	55	3.00
0.95	10.00	19.00	55	3.00
1.00	10.50	20.00	55	3.00
1.05	11.00	21.00	60	3.00
1.10	11.50	22.00	60	3.00
1.15	12.00	23.00	60	3.00
1.20	12.50	24.00	60	3.00
1.25	13.00	25.00	60	3.00
1.30	13.50	26.00	65	3.00
1.35	14.00	27.00	65	3.00
1.40	14.50	28.00	65	3.00
1.45	15.00	29.00	65	3.00
1.50	15.50	30.00	65	3.00
1.55	16.00	31.00	72	3.00
1.60	16.50	32.00	72	3.00
1.65	17.00	33.00	72	3.00
1.70	17.50	34.00	72	3.00
1.75	18.00	35.00	78	3.00
1.80	18.50	36.00	78	3.00
1.85	19.00	37.00	78	3.00
1.90	19.50	38.00	78	3.00
1.95	20.00	39.00	78	3.00
2.00	20.50	40.00	78	3.00

Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50740

P1–3 M1,2 K1,2 N1–6 S1 O1



VHM MD/SC

d1 + 0.004 0

Mi-Nova

Z 2

126°

30°

10×d

40×d

122

151

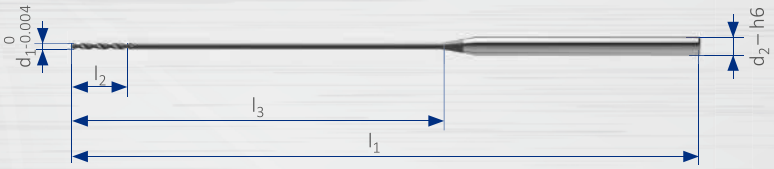
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.40	4.50	16.00	50	3.00
0.45	5.00	18.00	50	3.00
0.50	5.50	20.00	70	3.00
0.55	6.00	22.00	70	3.00
0.60	6.50	24.00	70	3.00
0.65	7.00	26.00	70	3.00
0.70	7.50	28.00	70	3.00
0.75	8.00	30.00	70	3.00
0.80	8.50	32.00	78	3.00
0.85	9.00	34.00	78	3.00
0.90	9.50	36.00	78	3.00
0.95	10.00	38.00	78	3.00
1.00	10.50	40.00	78	3.00
1.05	11.00	42.00	88	3.00
1.10	11.50	44.00	88	3.00
1.15	12.00	46.00	88	3.00
1.20	12.50	48.00	88	3.00
1.25	13.00	50.00	88	3.00
1.30	13.50	52.00	98	3.00
1.35	14.00	54.00	98	3.00
1.40	14.50	56.00	98	3.00
1.45	15.00	58.00	98	3.00
1.50	15.50	60.00	98	3.00

swiss made by SPHINX TOOLS

Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50760

P1–3 M1,2 K1,2 N1–6 S1 O1



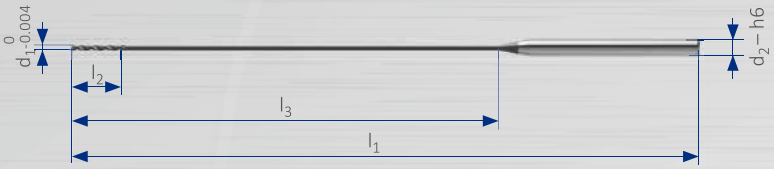
VHM MD/SC | Mi-Nova | Z 2 | 126° | 30° | 10×d | 60×d | 122 | 151

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.40	4.50	24.00	60	3.00
0.45	5.00	27.00	60	3.00
0.50	5.50	30.00	85	3.00
0.55	6.00	33.00	85	3.00
0.60	6.50	36.00	85	3.00
0.65	7.00	39.00	85	3.00
0.70	7.50	42.00	85	3.00
0.75	8.00	45.00	85	3.00
0.80	8.50	48.00	100	3.00
0.85	9.00	51.00	100	3.00
0.90	9.50	54.00	100	3.00
0.95	10.00	57.00	100	3.00
1.00	10.50	60.00	100	3.00
1.05	11.00	63.00	115	3.00
1.10	11.50	66.00	115	3.00
1.15	12.00	69.00	115	3.00
1.20	12.50	72.00	115	3.00
1.25	13.00	75.00	115	3.00
1.30	13.50	78.00	130	3.00
1.35	14.00	81.00	130	3.00
1.40	14.50	84.00	130	3.00
1.45	15.00	87.00	130	3.00
1.50	15.50	90.00	130	3.00

Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50780

P1–3 | M1,2 | K1,2 | N1–6 | S1 | O1



VHM MD/SC | Mi-Nova | Z 2 | 126° | 30° | 10×d | 80×d | 122 | 151

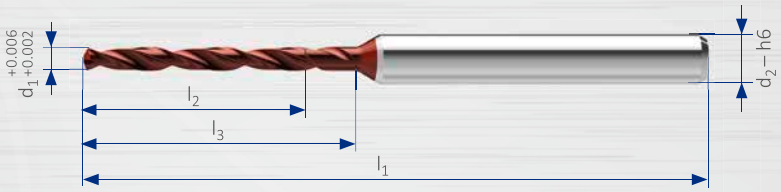
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.40	4.50	32.00	70	3.00
0.45	5.00	36.00	70	3.00
0.50	5.50	40.00	100	3.00
0.55	6.00	44.00	100	3.00
0.60	6.50	48.00	100	3.00
0.65	7.00	52.00	100	3.00
0.70	7.50	56.00	100	3.00
0.75	8.00	60.00	100	3.00
0.80	8.50	64.00	120	3.00
0.85	9.00	68.00	120	3.00
0.90	9.50	72.00	120	3.00
0.95	10.00	76.00	120	3.00
1.00	10.50	80.00	120	3.00
1.05	11.00	84.00	140	3.00
1.10	11.50	88.00	140	3.00
1.15	12.00	92.00	140	3.00
1.20	12.50	96.00	140	3.00
1.25	13.00	100.00	140	3.00
1.30	13.50	104.00	160	3.00
1.35	14.00	108.00	160	3.00
1.40	14.50	112.00	160	3.00
1.45	15.00	116.00	160	3.00
1.50	15.50	120.00	160	3.00

swiss made by SPHINX TOOLS

Hochleistungsbohrer Nirox
Foret à grand rendement Nirox
Punta ad alto rendimento Nirox
High performance drill Nirox

Art. 51609

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



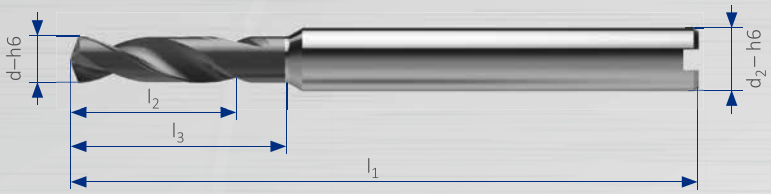
VHM MD/SC | d_1 + 0.006 + 0.002 | TiAlSiN | Z 2 | 140° | 28° | 9xd | 123

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.30	2.70	3.30	38	3.00
0.35	3.20	3.90	38	3.00
0.40	3.60	4.40	38	3.00
0.45	4.10	5.00	38	3.00
0.50	4.50	5.50	38	3.00
0.55	5.00	6.10	38	3.00
0.60	5.40	6.60	38	3.00
0.65	5.90	7.20	38	3.00
0.70	6.30	7.70	38	3.00
0.75	6.80	8.30	38	3.00
0.80	7.20	8.80	38	3.00
0.85	7.70	9.40	38	3.00
0.90	8.10	9.90	38	3.00
0.95	8.60	10.50	38	3.00
1.00	9.00	11.00	38	3.00
1.05	9.50	11.60	38	3.00
1.10	9.90	12.10	38	3.00
1.15	10.40	12.70	38	3.00
1.20	10.80	13.20	38	3.00
1.25	11.30	13.80	38	3.00
1.30	11.70	14.30	38	3.00
1.35	12.20	14.90	38	3.00
1.40	12.60	15.40	38	3.00
1.45	13.10	16.00	38	3.00
1.50	13.50	16.50	38	3.00
1.55	14.00	17.10	50	3.00
1.60	14.40	17.60	50	3.00
1.65	14.90	18.20	50	3.00
1.70	15.30	18.70	50	3.00
1.75	15.80	19.30	50	3.00
1.80	16.20	19.80	50	3.00
1.85	16.70	20.40	50	3.00
1.90	17.10	20.90	50	3.00
1.95	17.60	21.50	50	3.00
2.00	18.00	22.00	50	3.00
2.05	18.50	22.60	50	3.00
2.10	18.90	23.10	50	3.00
2.15	19.40	23.70	50	3.00
2.20	19.80	24.20	50	3.00
2.25	20.30	24.80	50	3.00
2.30	20.70	25.30	50	3.00
2.35	21.20	25.90	50	3.00
2.40	21.60	26.40	50	3.00
2.45	22.10	27.00	50	3.00
2.50	22.50	27.50	55	3.00
2.55	23.00	28.10	55	3.00
2.60	23.40	28.60	55	3.00
2.65	23.90	29.20	55	3.00
2.70	24.30	29.70	55	3.00
2.75	24.80	30.30	55	3.00
2.80	25.20	30.80	55	3.00
2.85	25.70	31.40	55	3.00
2.90	26.10	31.90	55	3.00
2.95	26.60	32.50	55	3.00
3.00	27.00	33.00	55	3.00

Hochleistungsbohrer Phoenix TC2
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52903

P1–3 M1,2 K1,2 N1–6 S1,2 H1 O1



VHM MD/SC | AlTiCrN+S | Z 2 | 140° | ~30° | 3×d

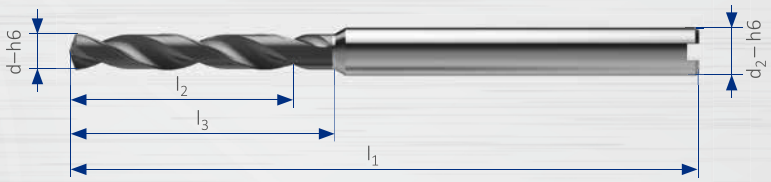
123 | 152

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
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52906

P1–3 M1,2 K1,2 N1–6 S1,2 H1 O1



VHM MD/SC | AlTiCrN+S | Z 2 | 140° | ~30° | 6×d

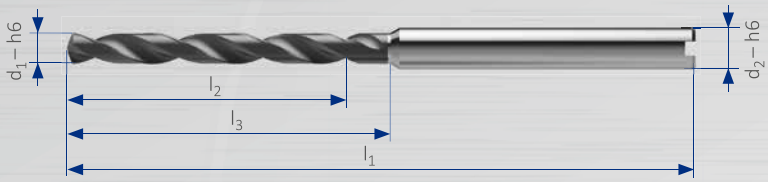
123 | 152

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
3.68	22.20	26.20	66	6.00
3.70	22.20	26.20	66	6.00
3.72	22.40	26.40	66	6.00
3.74	22.50	26.50	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
4.63	27.90	36.00	79	6.00
4.65	27.90	36.00	79	6.00
4.67	28.10	36.00	79	6.00
4.69	28.20	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
5.53	33.30	41.50	81	6.00
5.55	33.30	41.50	81	6.00
5.57	33.50	41.50	81	6.00
5.59	33.60	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
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52909

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



VHM MD/SC | AlTiCrN+S | Z 2 | 140° | ~30° | 9×d

i 123 | i 152

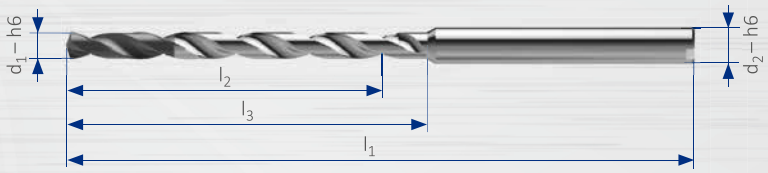
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	9.00	11.00	51	3.00
1.10	9.90	12.00	51	3.00
1.20	10.80	13.00	51	3.00
1.30	11.70	14.00	51	3.00
1.40	12.60	15.00	51	3.00
1.50	13.50	16.50	51	3.00
1.60	14.40	17.50	51	3.00
1.70	15.30	18.50	51	3.00
1.80	16.20	19.00	51	3.00
1.90	17.10	20.00	51	3.00
2.00	18.00	21.00	51	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	71.00	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

swiss made by SPHINX TOOLS

Hochleistungsbohrer Phoenix TC2
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52912

P1–3 M1,2 K1,2 N1–6 S1,2 H1 O1



VHM MD/SC | AlCrTiN | Z 2 | 137° | ~30° | 12×d

124 | 153

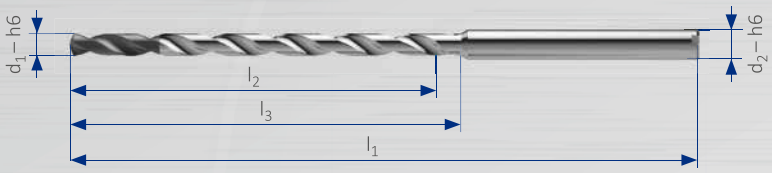
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	12.00	14.00	50	3.00
1.10	13.20	15.50	50	3.00
1.20	14.40	16.50	50	3.00
1.30	15.60	17.50	50	3.00
1.40	16.80	19.00	50	3.00
1.50	18.00	21.00	50	3.00
1.60	19.20	22.50	50	3.00
1.70	20.40	23.50	50	3.00
1.80	21.60	24.50	50	3.00
1.90	22.80	26.00	55	3.00
2.00	24.00	27.00	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
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52916

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



VHM MD/SC | AlCrTiN | Z 2 | 137° | ~30° | 16×d

124 | 153

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

swiss made by SPHINX TOOLS

Hochleistungsbohrer Phoenix TC2
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52920

P3 M1,2 K1,2 N1–3 S1,2 H1 O1

VHM MD/SC | AlCrTiN | Z 2 | 137° | ~30° | 20×d

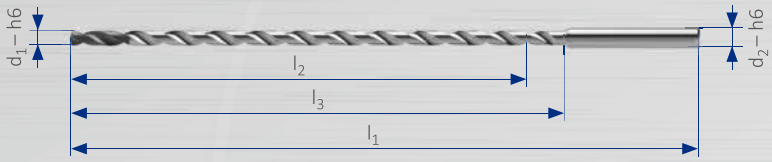
124 | 153

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
Foret à grand rendement Phoenix TC2
Punta ad alto rendimento Phoenix TC2
High performance drill Phoenix TC2

Art. 52930

P3 M1,2 K1,2 N1–3 S1,2 H1 O1



VHM MD/SC

AlCrTiN

Z 2

137°

~30°

30×d

124

153

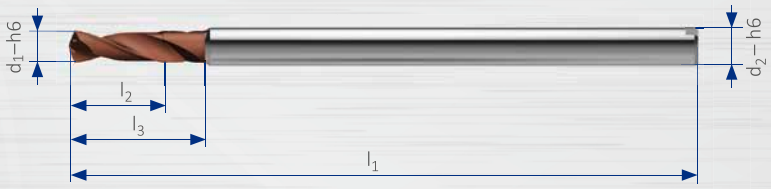
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	90.00	99.00	138	6.00
3.30	99.00	108.00	146	6.00
4.00	120.00	134.00	172	6.00
4.20	126.00	140.00	178	6.00
5.00	150.00	167.00	205	6.00
6.00	180.00	198.00	236	6.00
6.80	204.00	224.00	264	8.00
7.00	210.00	231.00	271	8.00
8.00	240.00	262.00	302	8.00
8.50	255.00	280.00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

swiss made by SPHINX TOOLS

Hochleistungsbohrer Phoenix
Foret à grand rendement Phoenix
Punta ad alto rendimento Phoenix
High performance drill Phoenix

Art. 50938

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1



VHM MD/SC | AlCrN | Z 2 | 140° | ~30° | 3×d | < 2.5 mm | > 2.5 mm | 125

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

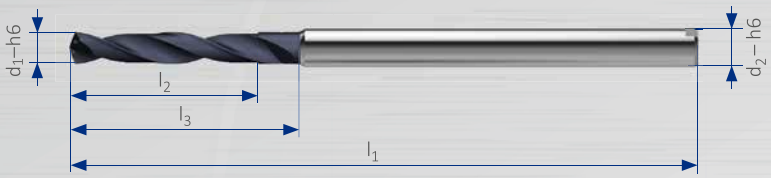
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
4.80	14.40	22.50	60	6.00
4.90	14.70	22.50	60	6.00
5.00	15.00	23.00	60	6.00
5.10	15.30	23.50	64	6.00
5.20	15.60	23.50	64	6.00
5.30	15.90	24.00	64	6.00
5.40	16.20	24.00	64	6.00
5.50	16.50	24.50	64	6.00
5.60	16.80	24.50	64	6.00
5.70	17.10	25.50	64	6.00
5.80	17.40	25.50	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

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
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
Foret à grand rendement Phoenix
Punta ad alto rendimento Phoenix
High performance drill Phoenix

Art. 50940

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1



VHM MD/SC | TiAlN | Z 2 | 140° | ~30° | 6×d | 125

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.00	6.00	8.00	38	3.00	2.90	17.40	20.40	50	3.00	4.80	28.80	37.00	79	6.00	7.40	44.40	54.50	95	8.00
1.05	6.30	8.30	38	3.00	2.95	17.70	20.70	50	3.00	4.85	29.10	37.50	79	6.00	7.50	45.00	55.00	95	8.00
1.10	6.60	8.60	38	3.00	3.00	18.00	21.00	50	3.00	4.90	29.40	37.50	79	6.00	7.60	45.60	55.50	95	8.00
1.15	6.90	8.90	38	3.00	3.05	18.30	22.30	66	6.00	4.95	29.70	38.00	79	6.00	7.70	46.20	56.00	95	8.00
1.20	7.20	9.20	38	3.00	3.10	18.60	22.60	66	6.00	5.00	30.00	38.00	79	6.00	7.80	46.80	57.00	95	8.00
1.25	7.50	9.50	38	3.00	3.15	18.90	22.90	66	6.00	5.05	30.30	38.50	79	6.00	7.90	47.40	57.50	95	8.00
1.30	7.80	9.80	38	3.00	3.20	19.20	23.20	66	6.00	5.10	30.60	38.50	79	6.00	8.00	48.00	58.00	95	8.00
1.35	8.10	10.10	38	3.00	3.25	19.50	23.50	66	6.00	5.15	30.90	39.00	79	6.00	8.10	48.60	59.50	106	10.00
1.40	8.40	10.40	38	3.00	3.30	19.80	23.80	66	6.00	5.20	31.20	39.00	79	6.00	8.20	49.20	60.00	106	10.00
1.45	8.70	10.70	38	3.00	3.35	20.10	24.10	66	6.00	5.25	31.50	40.00	79	6.00	8.30	49.80	61.00	106	10.00
1.50	9.00	11.00	38	3.00	3.40	20.40	24.40	66	6.00	5.30	31.80	40.00	79	6.00	8.40	50.40	61.50	106	10.00
1.55	9.30	11.30	38	3.00	3.45	20.70	24.70	66	6.00	5.35	32.10	40.50	79	6.00	8.50	51.00	62.00	106	10.00
1.60	9.60	12.60	38	3.00	3.50	21.00	25.00	66	6.00	5.40	32.40	40.50	79	6.00	8.60	51.60	62.50	106	10.00
1.65	9.90	12.90	38	3.00	3.55	21.30	25.30	66	6.00	5.45	32.70	41.00	79	6.00	8.70	52.20	63.00	106	10.00
1.70	10.20	13.20	38	3.00	3.60	21.60	25.60	66	6.00	5.50	33.00	41.00	79	6.00	8.80	52.80	64.00	106	10.00
1.75	10.50	13.50	38	3.00	3.65	21.90	25.90	66	6.00	5.55	33.30	41.50	81	6.00	8.90	53.40	64.50	106	10.00
1.80	10.80	13.80	38	3.00	3.70	22.20	26.20	66	6.00	5.60	33.60	41.50	81	6.00	9.00	54.00	65.00	106	10.00
1.85	11.10	14.10	38	3.00	3.75	22.50	26.50	66	6.00	5.65	33.90	42.00	81	6.00	9.10	54.60	65.50	113	10.00
1.90	11.40	14.40	38	3.00	3.80	22.80	26.80	66	6.00	5.70	34.20	42.00	81	6.00	9.20	55.20	66.00	113	10.00
1.95	11.70	14.70	38	3.00	3.85	23.10	27.10	66	6.00	5.75	34.50	43.00	81	6.00	9.30	55.80	67.00	113	10.00
2.00	12.00	15.00	50	3.00	3.90	23.40	27.40	66	6.00	5.80	34.80	43.00	81	6.00	9.40	56.40	67.50	113	10.00
2.05	12.30	15.30	50	3.00	3.95	23.70	27.70	66	6.00	5.85	35.10	43.50	81	6.00	9.50	57.00	68.00	113	10.00
2.10	12.60	15.60	50	3.00	4.00	24.00	28.00	66	6.00	5.90	35.40	43.50	81	6.00	9.60	57.60	68.50	113	10.00
2.15	12.90	15.90	50	3.00	4.05	24.30	30.20	79	6.00	5.95	35.70	44.00	81	6.00	9.70	58.20	69.00	113	10.00
2.20	13.20	16.20	50	3.00	4.10	24.60	30.50	79	6.00	6.00	36.00	44.00	81	6.00	9.80	58.80	70.00	113	10.00
2.25	13.50	16.50	50	3.00	4.15	24.90	31.00	79	6.00	6.10	36.60	45.50	89	8.00	9.90	59.40	70.50	113	10.00
2.30	13.80	16.80	50	3.00	4.20	25.20	31.00	79	6.00	6.20	37.20	46.00	89	8.00	10.00	60.00	72.00	113	10.00
2.35	14.10	17.10	50	3.00	4.25	25.50	31.50	79	6.00	6.30	37.80	47.00	89	8.00	10.10	60.60	72.50	125	12.00
2.40	14.40	17.40	50	3.00	4.30	25.80	32.00	79	6.00	6.40	38.40	47.50	89	8.00	10.20	61.20	73.00	125	12.00
2.45	14.70	17.70	50	3.00	4.35	26.10	32.50	79	6.00	6.50	39.00	48.00	89	8.00	10.30	61.80	74.00	125	12.00
2.50	15.00	18.00	50	3.00	4.40	26.40	32.50	79	6.00	6.60	39.60	48.50	89	8.00	10.40	62.40	74.50	125	12.00
2.55	15.30	18.30	50	3.00	4.45	26.70	33.00	79	6.00	6.70	40.20	49.00	89	8.00	10.50	63.00	75.00	125	12.00
2.60	15.60	18.60	50	3.00	4.50	27.00	33.00	79	6.00	6.80	40.80	50.00	89	8.00	10.60	63.60	75.50	125	12.00
2.65	15.90	18.90	50	3.00	4.55	27.30	35.50	79	6.00	6.90	41.40	50.50	89	8.00	10.70	64.20	76.00	125	12.00
2.70	16.20	19.20	50	3.00	4.60	27.60	35.50	79	6.00	7.00	42.00	52.00	89	8.00	10.80	64.80	77.00	125	12.00
2.75	16.50	19.50	50	3.00	4.65	27.90	36.00	79	6.00	7.10	42.60	52.50	95	8.00	10.90	65.40	77.50	125	12.00
2.80	16.80	19.80	50	3.00	4.70	28.20	36.00	79	6.00	7.20	43.20	53.50	95	8.00	11.00	66.00	79.00	125	12.00
2.85	17.10	20.10	50	3.00	4.75	28.50	37.00	79	6.00	7.30	43.80	54.00	95	8.00	11.10	66.60	79.50	132	12.00

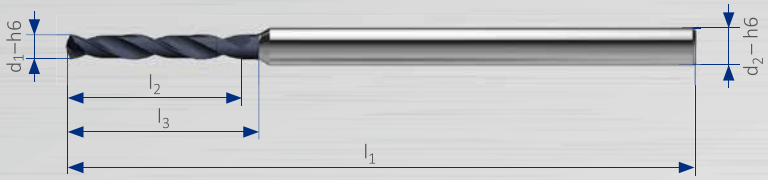
swiss made by SPHINX TOOLS

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

Art. 50941

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1



VHM MD/SC | TiAlN | Z 2 | 140° | 30° | 6×d | 126

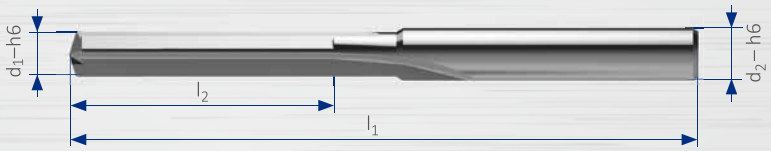
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.50	3.00	4.80	38	3.00
0.60	3.60	5.40	38	3.00
0.70	4.20	6.00	38	3.00
0.80	4.80	6.70	38	3.00
0.90	5.40	7.80	38	3.00
1.00	6.00	8.00	38	3.00
1.10	6.60	8.60	38	3.00
1.20	7.20	9.20	38	3.00
1.30	7.80	9.80	38	3.00
1.40	8.40	10.40	38	3.00
1.50	9.00	11.00	38	3.00
1.60	9.60	12.60	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
2.50	15.00	18.00	50	3.00
2.60	15.60	18.60	50	3.00
2.70	16.20	19.20	50	3.00
2.80	16.80	19.80	50	3.00
2.90	17.40	20.40	50	3.00
3.00	18.00	21.00	50	3.00

swiss made by SPHINX TOOLS

Hochleistungsbohrer Quadro Plus
Foret à grand rendement Quadro Plus
Punta ad alto rendimento Quadro Plus
High performance drill Quadro Plus

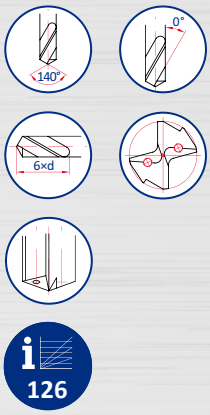
Art. 52100

K1,2 N2,3,5 O1



VHM MD/SC

Z 2



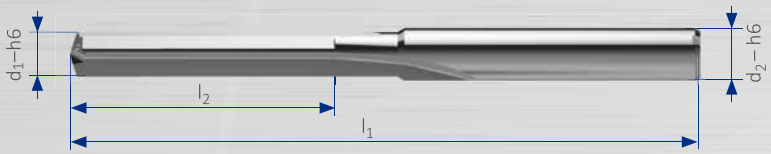
i 126

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

Hochleistungsbohrer Quadro Plus
Foret à grand rendement Quadro Plus
Punta ad alto rendimento Quadro Plus
High performance drill Quadro Plus

Art. 52200

K1,2 N2,3,5 O1



VHM MD/SC

Z 2

i 126

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

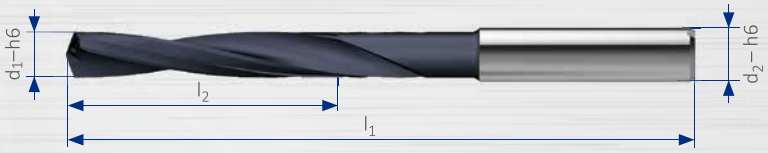
d_1 mm	l_2 mm	l_1 mm	d_2 mm
17.00	204.00	300	18.00
17.50	210.00	300	18.00
18.00	216.00	300	18.00
18.50	222.00	327	20.00
19.00	228.00	327	20.00
19.50	234.00	327	20.00
20.00	240.00	327	20.00

swiss made by SPHINX TOOLS

Hochleistungsbohrer Quadro 15 Plus
Foret à grand rendement Quadro 15 Plus
Punta ad alto rendimento Quadro 15 Plus
High performance drill Quadro 15 Plus

Art. 52150

P1,2 K1,2 N3,5 H1



VHM MD/SC

TiAlN

Z 2

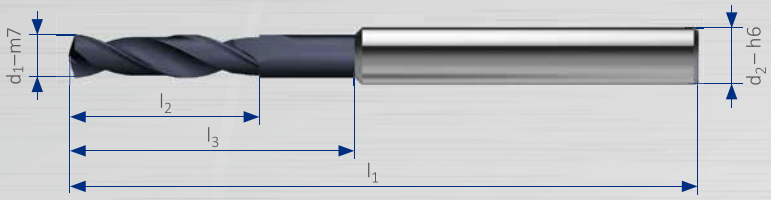
i 127

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

Spiralbohrer Fastcut
Foret hélicoïdal Fastcut
Punta elicoidale Fastcut
Twist drill Fastcut

Art. 50950

P1–3 | M1,2 | K1,2 | N2,3 | S1 | H1–3



VHM MD/SC | TiAlN | d1 m7 | DIN 6537 | Z 2 | 140° | 30° | 3xd | 127

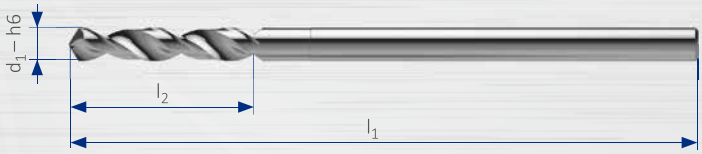
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
3.00	14.00	20.00	62	6.00
3.10	14.00	20.00	62	6.00
3.20	14.00	20.00	62	6.00
3.30	14.00	20.00	62	6.00
3.40	14.00	20.00	62	6.00
3.50	14.00	20.00	62	6.00
3.60	14.00	20.00	62	6.00
3.70	14.00	20.00	62	6.00
3.80	17.00	24.00	66	6.00
3.90	17.00	24.00	66	6.00
4.00	17.00	24.00	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

swiss made by SPHINX TOOLS

Spiralbohrer Posicut
Foret hélicoïdal Posicut
Punta elicoidale Posicut
Twist drill Posicut

Art. 50830

P1–3 M1,2 K1,2 N1–4 N6–8 S1,2 O1



VHM MD/SC

DIN 6539

Z 2

118°

35°

~5×d

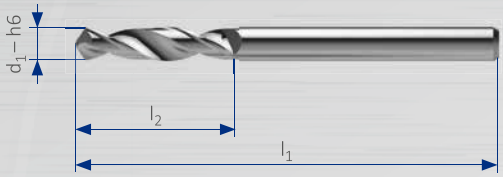
128

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

Spiralbohrer Spirec
Foret hélicoïdal Spirec
Punta elicoidale Spirec
Twist drill Spirec

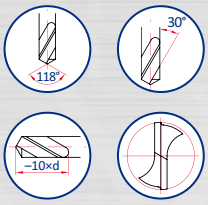
Art. 50838

P1–3 M1,2 K1,2 N1–6 S1 O1



VHM MD/SC

Z 2



i 128

d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm
0.30	3.70	38	2.20	14.70	38	4.90	24.70	50
0.35	3.70	38	2.25	14.70	38	5.00	24.70	50
0.40	4.70	38	2.30	14.70	38	5.10	24.70	50
0.45	4.70	38	2.35	14.70	38	5.20	24.70	50
0.50	5.70	38	2.40	14.70	38	5.30	24.70	50
0.55	5.70	38	2.45	14.70	38	5.40	24.70	50
0.60	7.70	38	2.50	14.70	38	5.50	24.70	50
0.65	7.70	38	2.55	14.70	38	5.60	24.70	50
0.70	9.70	38	2.60	14.70	38	5.70	24.70	50
0.75	9.70	38	2.65	14.70	38	5.80	24.70	50
0.80	11.70	38	2.70	14.70	38	5.90	24.70	50
0.85	11.70	38	2.75	14.70	38	6.00	24.70	50
0.90	14.70	38	2.80	14.70	38			
0.95	14.70	38	2.85	14.70	38			
1.00	14.70	38	2.90	14.70	38			
1.05	14.70	38	2.95	14.70	38			
1.10	14.70	38	3.00	14.70	38			
1.15	14.70	38	3.05	14.70	38			
1.20	14.70	38	3.10	14.70	38			
1.25	14.70	38	3.15	14.70	38			
1.30	14.70	38	3.175	14.70	38			
1.35	14.70	38	3.20	19.70	50			
1.40	14.70	38	3.30	19.70	50			
1.45	14.70	38	3.40	19.70	50			
1.50	14.70	38	3.50	19.70	50			
1.55	14.70	38	3.60	19.70	50			
1.60	14.70	38	3.70	19.70	50			
1.65	14.70	38	3.80	19.70	50			
1.70	14.70	38	3.90	19.70	50			
1.75	14.70	38	4.00	19.70	50			
1.80	14.70	38	4.10	24.70	50			
1.85	14.70	38	4.20	24.70	50			
1.90	14.70	38	4.30	24.70	50			
1.95	14.70	38	4.40	24.70	50			
2.00	14.70	38	4.50	24.70	50			
2.05	14.70	38	4.60	24.70	50			
2.10	14.70	38	4.70	24.70	50			
2.15	14.70	38	4.80	24.70	50			

Spiralbohrer Spicut
Foret hélicoïdal Spicut
Punta elicoidale Spicut
Twist drill Spicut

Art. 50820

P1,2 K1,2 N2,3,5

VHM MD/SC

DIN 338

Z 2

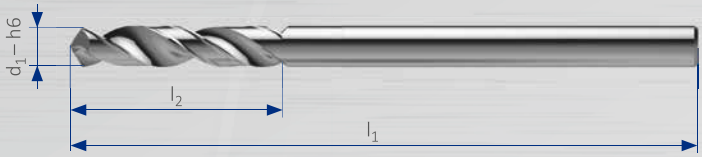
i 129

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
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
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

Bohrreibahle Asycut
Foret alésoir Asycut
Punta alesatore Asycut
Drill reamer Asycut

Art. 50840

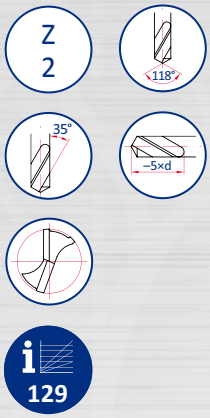
P1,2 M1,2 K1,2 N1–4



VHM MD/SC

DIN 6539

Z 2



i 129

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

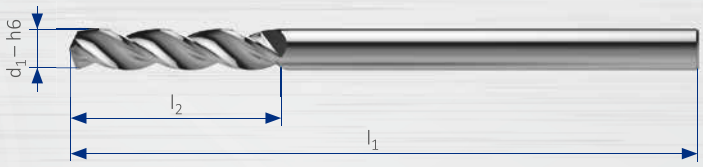
d_1 mm	l_2 mm	l_1 mm
5.80	27.00	66
5.90	27.00	66
6.00	27.00	66
6.10	30.00	70
6.20	30.00	70
6.30	30.00	70
6.40	30.00	70
6.50	30.00	70
6.60	30.00	70
6.70	30.00	70
6.80	33.00	74
6.90	33.00	74
7.00	33.00	74
7.10	33.00	74
7.20	33.00	74
7.30	33.00	74
7.40	33.00	74
7.50	33.00	74
7.60	36.00	79
7.70	36.00	79
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
Foret alésoir Tricut
Punta alesatore Tricut
Drill reamer Tricut

Art. 55654

P1,2 | M1 | K1,2 | N2,3 | S1 | O1



VHM MD/SC | DIN 6539 | Z 3 | 140° | 35° | ~5×d | 130

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

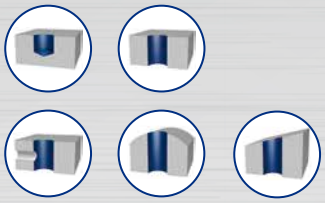
d_1 mm		l_2 mm	l_1 mm
4.60		22.5	58
4.70		22.5	58
4.763	3/16“	24.5	62
4.80		24.5	62
4.90		24.5	62
5.00		24.5	62
5.10		24.5	62
5.20		24.5	62
5.30		24.5	62
5.40		26.0	66
5.50		26.0	66
5.556	7/32“	26.0	66
5.60		26.0	66
5.70		26.0	66
5.80		26.0	66
5.90		26.0	66
6.00		26.0	66
6.10		28.5	70
6.20		28.5	70
6.30		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

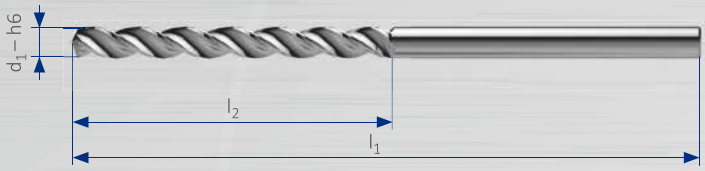
d_1 mm		l_2 mm	l_1 mm
7.938	5/16“	34.0	79
8.00		34.0	79
8.10		34.0	79
8.20		34.0	79
8.30		34.0	79
8.40		34.0	79
8.50		34.0	79
8.60		36.5	84
8.70		36.5	84
8.80		36.5	84
8.90		36.5	84
9.00		36.5	84
9.10		36.5	84
9.20		36.5	84
9.30		36.5	84
9.40		36.5	84
9.50		36.5	84
9.525	3/8“	39.0	89
9.60		39.0	89
9.70		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
Foret alésoir Tricut
Punta alesatore Tricut
Drill reamer Tricut

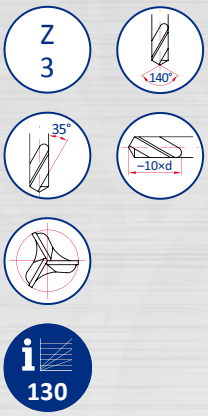
Art. 55338

P1,2 | M1 | K1,2 | N2,3 | S1 | O1





VHM MD/SC | DIN 338 | Z 3



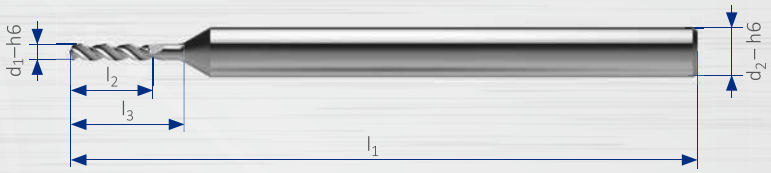
i 130

d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm
1.00	11.5	34	4.80	50.0	86	8.60	78.0	125
1.10	13.0	36	4.90	50.0	86	8.70	78.0	125
1.20	15.0	38	5.00	50.0	86	8.80	78.0	125
1.30	15.0	38	5.10	50.0	86	8.90	78.0	125
1.40	17.0	40	5.20	50.0	86	9.00	78.0	125
1.50	17.0	40	5.30	50.0	86	9.10	78.0	125
1.60	19.0	43	5.40	55.0	93	9.20	78.0	125
1.70	19.0	43	5.50	55.0	93	9.30	78.0	125
1.80	21.0	46	5.60	55.0	93	9.40	78.0	125
1.90	21.0	46	5.70	55.0	93	9.50	78.0	125
2.00	22.0	49	5.80	55.0	93	9.60	84.0	133
2.10	22.0	49	5.90	55.0	93	9.70	84.0	133
2.20	25.0	53	6.00	55.0	93	9.80	84.0	133
2.30	25.0	53	6.10	60.0	101	9.90	84.0	133
2.40	28.0	57	6.20	60.0	101	10.00	84.0	133
2.50	28.0	57	6.30	60.0	101	10.20	84.0	133
2.60	28.0	57	6.40	60.0	101	10.50	84.0	133
2.70	31.0	61	6.50	60.0	101	11.00	91.0	142
2.80	31.0	61	6.60	60.0	101	11.50	91.0	142
2.90	31.0	61	6.70	60.0	101	12.00	98.0	151
3.00	31.0	61	6.80	66.0	109	12.50	98.0	151
3.10	34.0	65	6.90	66.0	109	13.00	98.0	151
3.20	34.0	65	7.00	66.0	109	13.50	105.0	160
3.30	34.0	65	7.10	66.0	109	14.00	105.0	160
3.40	37.0	70	7.20	66.0	109			
3.50	37.0	70	7.30	66.0	109			
3.60	37.0	70	7.40	66.0	109			
3.70	37.0	70	7.50	66.0	109			
3.80	41.0	75	7.60	72.0	117			
3.90	41.0	75	7.70	72.0	117			
4.00	41.0	75	7.80	72.0	117			
4.10	41.0	75	7.90	72.0	117			
4.20	41.0	75	8.00	72.0	117			
4.30	45.0	80	8.10	72.0	117			
4.40	45.0	80	8.20	72.0	117			
4.50	45.0	80	8.30	72.0	117			
4.60	45.0	80	8.40	72.0	117			
4.70	45.0	80	8.50	72.0	117			

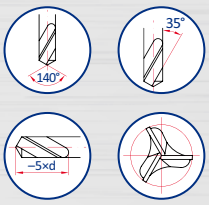
Mikrotricut
Microtricut
Microtricut
Microtricut

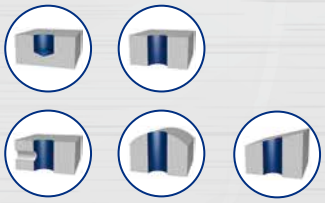
Art. 55652

P1,2 | M1 | K1,2 | N2,3 | S1 | O1



VHM MD/SC | Z 3





i 130

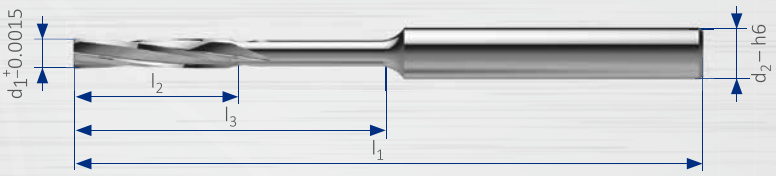
d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.20	1.00	1.50	38	3.00	0.58	2.90	3.40	38	3.00	0.96	4.80	5.30	38	3.00	1.34	6.70	9.50	38	3.00
0.21	1.05	1.50	38	3.00	0.59	2.95	3.40	38	3.00	0.97	4.85	5.30	38	3.00	1.35	6.75	9.50	38	3.00
0.22	1.10	1.60	38	3.00	0.60	3.00	3.50	38	3.00	0.98	4.90	5.40	38	3.00	1.36	6.80	9.50	38	3.00
0.23	1.15	1.60	38	3.00	0.61	3.05	3.50	38	3.00	0.99	4.95	5.40	38	3.00	1.37	6.85	9.50	38	3.00
0.24	1.20	1.70	38	3.00	0.62	3.10	3.60	38	3.00	1.00	5.00	6.50	38	3.00	1.38	6.90	9.50	38	3.00
0.25	1.25	1.70	38	3.00	0.63	3.15	3.60	38	3.00	1.01	5.05	6.50	38	3.00	1.39	6.95	9.50	38	3.00
0.26	1.30	1.80	38	3.00	0.64	3.20	3.70	38	3.00	1.02	5.10	6.50	38	3.00	1.40	7.00	9.50	38	3.00
0.27	1.35	1.80	38	3.00	0.65	3.25	3.70	38	3.00	1.03	5.15	6.50	38	3.00	1.41	7.05	9.50	38	3.00
0.28	1.40	1.90	38	3.00	0.66	3.30	3.80	38	3.00	1.04	5.20	6.50	38	3.00	1.42	7.10	9.50	38	3.00
0.29	1.45	1.90	38	3.00	0.67	3.35	3.80	38	3.00	1.05	5.25	6.50	38	3.00	1.43	7.15	9.50	38	3.00
0.30	1.50	2.00	38	3.00	0.68	3.40	3.90	38	3.00	1.06	5.30	6.50	38	3.00	1.44	7.20	9.50	38	3.00
0.31	1.55	2.00	38	3.00	0.69	3.45	3.90	38	3.00	1.07	5.35	7.50	38	3.00	1.45	7.25	9.50	38	3.00
0.32	1.60	2.10	38	3.00	0.70	3.50	4.00	38	3.00	1.08	5.40	7.50	38	3.00	1.46	7.30	9.50	38	3.00
0.33	1.65	2.10	38	3.00	0.71	3.55	4.00	38	3.00	1.09	5.45	7.50	38	3.00	1.47	7.35	9.50	38	3.00
0.34	1.70	2.20	38	3.00	0.72	3.60	4.10	38	3.00	1.10	5.50	7.50	38	3.00	1.48	7.40	9.50	38	3.00
0.35	1.75	2.20	38	3.00	0.73	3.65	4.10	38	3.00	1.11	5.55	7.50	38	3.00	1.49	7.45	9.50	38	3.00
0.36	1.80	2.30	38	3.00	0.74	3.70	4.20	38	3.00	1.12	5.60	7.50	38	3.00	1.50	7.50	9.50	38	3.00
0.37	1.85	2.30	38	3.00	0.75	3.75	4.20	38	3.00	1.13	5.65	7.50	38	3.00	1.51	7.55	10.50	38	3.00
0.38	1.90	2.40	38	3.00	0.76	3.80	4.30	38	3.00	1.14	5.70	7.50	38	3.00	1.52	7.60	10.50	38	3.00
0.39	1.95	2.40	38	3.00	0.77	3.85	4.30	38	3.00	1.15	5.75	7.50	38	3.00	1.53	7.65	10.50	38	3.00
0.40	2.00	2.50	38	3.00	0.78	3.90	4.40	38	3.00	1.16	5.80	7.50	38	3.00	1.54	7.70	10.50	38	3.00
0.41	2.05	2.50	38	3.00	0.79	3.95	4.40	38	3.00	1.17	5.85	7.50	38	3.00	1.55	7.75	10.50	38	3.00
0.42	2.10	2.60	38	3.00	0.80	4.00	4.50	38	3.00	1.18	5.90	8.50	38	3.00	1.56	7.80	10.50	38	3.00
0.43	2.15	2.60	38	3.00	0.81	4.05	4.50	38	3.00	1.19	5.95	8.50	38	3.00	1.57	7.85	10.50	38	3.00
0.44	2.20	2.70	38	3.00	0.82	4.10	4.60	38	3.00	1.20	6.00	8.50	38	3.00	1.58	7.90	10.50	38	3.00
0.45	2.25	2.70	38	3.00	0.83	4.15	4.60	38	3.00	1.21	6.05	8.50	38	3.00	1.59	7.95	10.50	38	3.00
0.46	2.30	2.80	38	3.00	0.84	4.20	4.70	38	3.00	1.22	6.10	8.50	38	3.00	1.60	8.00	10.50	38	3.00
0.47	2.35	2.80	38	3.00	0.85	4.25	4.70	38	3.00	1.23	6.15	8.50	38	3.00	1.61	8.05	10.50	38	3.00
0.48	2.40	2.90	38	3.00	0.86	4.30	4.80	38	3.00	1.24	6.20	8.50	38	3.00	1.62	8.10	10.50	38	3.00
0.49	2.45	2.90	38	3.00	0.87	4.35	4.80	38	3.00	1.25	6.25	8.50	38	3.00	1.63	8.15	10.50	38	3.00
0.50	2.50	3.00	38	3.00	0.88	4.40	4.90	38	3.00	1.26	6.30	8.50	38	3.00	1.64	8.20	10.50	38	3.00
0.51	2.55	3.00	38	3.00	0.89	4.45	4.90	38	3.00	1.27	6.35	8.50	38	3.00	1.65	8.25	10.50	38	3.00
0.52	2.60	3.10	38	3.00	0.90	4.50	5.00	38	3.00	1.28	6.40	8.50	38	3.00	1.66	8.30	10.50	38	3.00
0.53	2.65	3.10	38	3.00	0.91	4.55	5.00	38	3.00	1.29	6.45	8.50	38	3.00	1.67	8.35	10.50	38	3.00
0.54	2.70	3.20	38	3.00	0.92	4.60	5.10	38	3.00	1.30	6.50	8.50	38	3.00	1.68	8.40	10.50	38	3.00
0.55	2.75	3.20	38	3.00	0.93	4.65	5.10	38	3.00	1.31	6.55	8.50	38	3.00	1.69	8.45	10.50	38	3.00
0.56	2.80	3.30	38	3.00	0.94	4.70	5.20	38	3.00	1.32	6.60	8.50	38	3.00	1.70	8.50	10.50	38	3.00
0.57	2.85	3.30	38	3.00	0.95	4.75	5.20	38	3.00	1.33	6.65	9.50	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	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
1.72	8.60	11.50	38	3.00	2.04	10.20	12.50	38	3.00	2.36	11.80	13.50	38	3.00	2.68	13.40	16.50	38	3.00
1.73	8.65	11.50	38	3.00	2.05	10.25	12.50	38	3.00	2.37	11.85	14.50	38	3.00	2.69	13.45	16.50	38	3.00
1.74	8.70	11.50	38	3.00	2.06	10.30	12.50	38	3.00	2.38	11.90	14.50	38	3.00	2.70	13.50	16.50	38	3.00
1.75	8.75	11.50	38	3.00	2.07	10.35	12.50	38	3.00	2.39	11.95	14.50	38	3.00	2.71	13.55	16.50	38	3.00
1.76	8.80	11.50	38	3.00	2.08	10.40	12.50	38	3.00	2.40	12.00	14.50	38	3.00	2.72	13.60	16.50	38	3.00
1.77	8.85	11.50	38	3.00	2.09	10.45	12.50	38	3.00	2.41	12.05	14.50	38	3.00	2.73	13.65	16.50	38	3.00
1.78	8.90	11.50	38	3.00	2.10	10.50	12.50	38	3.00	2.42	12.10	14.50	38	3.00	2.74	13.70	16.50	38	3.00
1.79	8.95	11.50	38	3.00	2.11	10.55	12.50	38	3.00	2.43	12.15	14.50	38	3.00	2.75	13.75	16.50	38	3.00
1.80	9.00	11.50	38	3.00	2.12	10.60	12.50	38	3.00	2.44	12.20	14.50	38	3.00	2.76	13.80	16.50	38	3.00
1.81	9.05	11.50	38	3.00	2.13	10.65	13.50	38	3.00	2.45	12.25	14.50	38	3.00	2.77	13.85	16.50	38	3.00
1.82	9.10	11.50	38	3.00	2.14	10.70	13.50	38	3.00	2.46	12.30	14.50	38	3.00	2.78	13.90	16.50	38	3.00
1.83	9.15	11.50	38	3.00	2.15	10.75	13.50	38	3.00	2.47	12.35	14.50	38	3.00	2.79	13.95	16.50	38	3.00
1.84	9.20	11.50	38	3.00	2.16	10.80	13.50	38	3.00	2.48	12.40	14.50	38	3.00	2.80	14.00	16.50	38	3.00
1.85	9.25	11.50	38	3.00	2.17	10.85	13.50	38	3.00	2.49	12.45	14.50	38	3.00	2.81	14.05	16.50	38	3.00
1.86	9.30	11.50	38	3.00	2.18	10.90	13.50	38	3.00	2.50	12.50	14.50	38	3.00	2.82	14.10	16.50	38	3.00
1.87	9.35	11.50	38	3.00	2.19	10.95	13.50	38	3.00	2.51	12.55	14.50	38	3.00	2.83	14.15	16.50	38	3.00
1.88	9.40	11.50	38	3.00	2.20	11.00	13.50	38	3.00	2.52	12.60	14.50	38	3.00	2.84	14.20	16.50	38	3.00
1.89	9.45	11.50	38	3.00	2.21	11.05	13.50	38	3.00	2.53	12.65	14.50	38	3.00	2.85	14.25	16.50	38	3.00
1.90	9.50	11.50	38	3.00	2.22	11.10	13.50	38	3.00	2.54	12.70	14.50	38	3.00	2.86	14.30	16.50	38	3.00
1.91	9.55	12.50	38	3.00	2.23	11.15	13.50	38	3.00	2.55	12.75	14.50	38	3.00	2.87	14.35	16.50	38	3.00
1.92	9.60	12.50	38	3.00	2.24	11.20	13.50	38	3.00	2.56	12.80	14.50	38	3.00	2.88	14.40	16.50	38	3.00
1.93	9.65	12.50	38	3.00	2.25	11.25	13.50	38	3.00	2.57	12.85	14.50	38	3.00	2.89	14.45	16.50	38	3.00
1.94	9.70	12.50	38	3.00	2.26	11.30	13.50	38	3.00	2.58	12.90	14.50	38	3.00	2.90	14.50	16.50	38	3.00
1.95	9.75	12.50	38	3.00	2.27	11.35	13.50	38	3.00	2.59	12.95	14.50	38	3.00	2.91	14.55	16.50	38	3.00
1.96	9.80	12.50	38	3.00	2.28	11.40	13.50	38	3.00	2.60	13.00	14.50	38	3.00	2.92	14.60	16.50	38	3.00
1.97	9.85	12.50	38	3.00	2.29	11.45	13.50	38	3.00	2.61	13.05	14.50	38	3.00	2.93	14.65	16.50	38	3.00
1.98	9.90	12.50	38	3.00	2.30	11.50	13.50	38	3.00	2.62	13.10	14.50	38	3.00	2.94	14.70	16.50	38	3.00
1.99	9.95	12.50	38	3.00	2.31	11.55	13.50	38	3.00	2.63	13.15	14.50	38	3.00	2.95	14.75	16.50	38	3.00
2.00	10.00	12.50	38	3.00	2.32	11.60	13.50	38	3.00	2.64	13.20	14.50	38	3.00	2.96	14.80	16.50	38	3.00
2.01	10.05	12.50	38	3.00	2.33	11.65	13.50	38	3.00	2.65	13.25	14.50	38	3.00	2.97	14.85	16.50	38	3.00
2.02	10.10	12.50	38	3.00	2.34	11.70	13.50	38	3.00	2.66	13.30	16.50	38	3.00	2.98	14.90	16.50	38	3.00
2.03	10.15	12.50	38	3.00	2.35	11.75	13.50	38	3.00	2.67	13.35	16.50	38	3.00	2.99	14.95	16.50	38	3.00

Reibahle
Alésoir
Alesatore
Reamer

Art. 58000

P1–3 M1,2 K1,2 N2–5 S1



VHM MD/SC

Z 3–6

right
right

ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
1.0–P7	0.987	8.00	16.00	48	3.00	3
1.0–H7	1.005	8.00	16.00	48	3.00	3
1.0–F7	1.011	8.00	16.00	48	3.00	3
	1.102	8.00	16.00	48	3.00	3
	1.115	8.00	16.00	48	3.00	3
	1.255	8.00	16.00	48	3.00	3
	1.480	10.00	20.00	52	3.00	3
	1.679	11.00	22.00	54	3.00	3
	1.690	11.00	22.00	54	3.00	3
	1.692	11.00	22.00	54	3.00	3
	1.695	11.00	22.00	54	3.00	3
	1.697	11.00	22.00	54	3.00	3
	1.701	11.00	22.00	54	3.00	3
	1.790	11.00	22.00	54	3.00	3
	1.985	11.00	22.00	54	3.00	4
2.0–P7	1.987	11.00	22.00	54	3.00	4
	1.995	11.00	22.00	54	3.00	4
2.0–H7	2.005	11.00	22.00	54	3.00	4
2.0–F7	2.011	11.00	22.00	54	3.00	4
	2.015	11.00	22.00	54	3.00	4
	2.040	11.00	22.00	54	3.00	4
	2.240	12.00	24.00	56	3.00	4
	2.285	12.00	24.00	56	3.00	4
	2.483	14.00	26.00	58	3.00	4
	2.970	15.00	30.00	60	3.00	4
	2.980	15.00	30.00	60	3.00	4
3.0–P7	2.987	15.00	30.00	60	3.00	4
	2.995	15.00	30.00	60	3.00	4
3.0–H7	3.005	15.00	30.00	60	3.00	4
3.0–F7	3.011	15.00	30.00	60	3.00	4
	3.020	15.00	30.00	60	3.00	4
	3.030	15.00	30.00	60	3.00	4
	3.045	15.00	30.00	60	3.00	4
	3.050	15.00	30.00	60	3.00	4
	3.060	15.00	30.00	60	3.00	4
	3.870	19.00	38.00	76	6.00	4
	3.970	19.00	38.00	76	6.00	6
	3.980	19.00	38.00	76	6.00	6

ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
4.0–P7	3.986	19.00	38.00	76	6.00	6
	3.992	19.00	38.00	76	6.00	6
4.0–H7	4.006	19.00	38.00	76	6.00	6
4.0–F7	4.016	19.00	38.00	76	6.00	6
	4.020	19.00	38.00	76	6.00	6
	4.025	19.00	38.00	76	6.00	6
	4.030	19.00	38.00	76	6.00	6
	4.040	19.00	38.00	76	6.00	6
	4.970	23.00	46.00	84	6.00	6
	4.980	23.00	46.00	84	6.00	6
5.0–P7	4.986	23.00	46.00	84	6.00	6
5.0–H7	5.006	23.00	46.00	84	6.00	6
5.0–F7	5.018	23.00	46.00	84	6.00	6
	5.020	23.00	46.00	84	6.00	6
	5.030	23.00	46.00	84	6.00	6
	5.206	23.00	46.00	84	6.00	6
	5.220	23.00	46.00	84	6.00	6
	5.970	26.00	52.00	90	6.00	6
	5.980	26.00	52.00	90	6.00	6
6.0–P7	5.986	26.00	52.00	90	6.00	6
6.0–H7	6.006	26.00	52.00	90	6.00	6
6.0–F7	6.018	26.00	52.00	90	6.00	6
	6.020	26.00	52.00	90	6.00	6
	6.030	26.00	52.00	90	6.00	6

Zwischendurchmesser auf Anfrage erhältlich

Diamètre intermédiaire sur demande

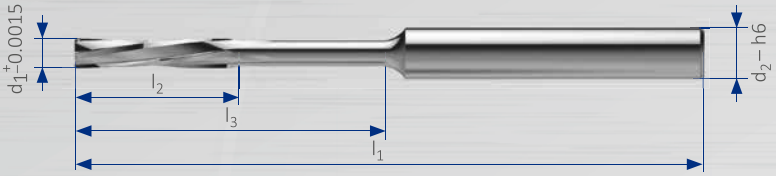
Diametri intermediari su richiesta

Diameter intermediate on request

Reibahle
Alésoir
Alesatore
Reamer

Art. 58500

P1–3 | M1,2 | K1,2 | N2–5 | S1



VHM MD/SC | Z 3–6 | 10° | –8×d | right left

131

ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
1.0–P7	0.987	8.00	16.00	48	3.00	3
1.0–H7	1.005	8.00	16.00	48	3.00	3
1.0–F7	1.011	8.00	16.00	48	3.00	3
	1.102	8.00	16.00	48	3.00	3
	1.115	8.00	16.00	48	3.00	3
	1.255	8.00	16.00	48	3.00	3
	1.480	10.00	20.00	52	3.00	3
	1.679	11.00	22.00	54	3.00	3
	1.690	11.00	22.00	54	3.00	3
	1.692	11.00	22.00	54	3.00	3
	1.695	11.00	22.00	54	3.00	3
	1.697	11.00	22.00	54	3.00	3
	1.701	11.00	22.00	54	3.00	3
	1.790	11.00	22.00	54	3.00	3
	1.985	11.00	22.00	54	3.00	4
2.0–P7	1.987	11.00	22.00	54	3.00	4
	1.995	11.00	22.00	54	3.00	4
2.0–H7	2.005	11.00	22.00	54	3.00	4
2.0–F7	2.011	11.00	22.00	54	3.00	4
	2.015	11.00	22.00	54	3.00	4
	2.040	11.00	22.00	54	3.00	4
	2.240	12.00	24.00	56	3.00	4
	2.285	12.00	24.00	56	3.00	4
	2.483	14.00	26.00	58	3.00	4
	2.970	15.00	30.00	60	3.00	4
	2.980	15.00	30.00	60	3.00	4
3.0–P7	2.987	15.00	30.00	60	3.00	4
	2.995	15.00	30.00	60	3.00	4
3.0–H7	3.005	15.00	30.00	60	3.00	4
3.0–F7	3.011	15.00	30.00	60	3.00	4
	3.020	15.00	30.00	60	3.00	4
	3.030	15.00	30.00	60	3.00	4
	3.045	15.00	30.00	60	3.00	4
	3.050	15.00	30.00	60	3.00	4
	3.060	15.00	30.00	60	3.00	4
	3.870	19.00	38.00	76	6.00	4
	3.970	19.00	38.00	76	6.00	6
	3.980	19.00	38.00	76	6.00	6

ø	d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	z
4.0–P7	3.986	19.00	38.00	76	6.00	6
	3.992	19.00	38.00	76	6.00	6
4.0–H7	4.006	19.00	38.00	76	6.00	6
4.0–F7	4.016	19.00	38.00	76	6.00	6
	4.020	19.00	38.00	76	6.00	6
	4.025	19.00	38.00	76	6.00	6
	4.030	19.00	38.00	76	6.00	6
	4.040	19.00	38.00	76	6.00	6
	4.970	23.00	46.00	84	6.00	6
	4.980	23.00	46.00	84	6.00	6
5.0–P7	4.986	23.00	46.00	84	6.00	6
5.0–H7	5.006	23.00	46.00	84	6.00	6
5.0–F7	5.018	23.00	46.00	84	6.00	6
	5.020	23.00	46.00	84	6.00	6
	5.030	23.00	46.00	84	6.00	6
	5.206	23.00	46.00	84	6.00	6
	5.220	23.00	46.00	84	6.00	6
	5.970	26.00	52.00	90	6.00	6
	5.980	26.00	52.00	90	6.00	6
6.0–P7	5.986	26.00	52.00	90	6.00	6
6.0–H7	6.006	26.00	52.00	90	6.00	6
6.0–F7	6.018	26.00	52.00	90	6.00	6
	6.020	26.00	52.00	90	6.00	6
	6.030	26.00	52.00	90	6.00	6

Zwischendurchmesser auf Anfrage erhältlich

Diamètre intermédiaire sur demande

Diametri intermediari su richiesta

Diameter intermediate on request

swiss made by SPHINX TOOLS

SPHINX TOOLS

Fräsen
Fraisage
Fresare
Milling

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Incre-ments	Bearbei-tungstiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	Zähne-zahl Number of teeth
Gravierfräser **Fraise à graver**							
	70030	0.02 – 0.15	0.01		30°	0°	1
	70040	0.02 – 0.15	0.01		40°	0°	1
	70050	0.02 – 0.15	0.01		50°	0°	1
	70060	0.02 – 0.15	0.01		60°	0°	1
	70090	0.02 – 0.15	0.01		90°	0°	1
	70130	0.04 – 0.10	0.01		30°	0°	1
	70140	0.04 – 0.10	0.01		40°	0°	1
	70150	0.04 – 0.10	0.01		50°	0°	1
	70160	0.04 – 0.10	0.01		60°	0°	1
	70190	0.04 – 0.10	0.01		90°	0°	1
Mikrofräser **Micro fraise**							
	72075	0.20 – 2.00	0.10	0.75 × ø		30°	2
	72150	0.10 – 2.00	0.10	1.5 × ø		30°	2
	42000	0.10 – 3.00	0.05	3 × ø		30°	2
	72500	0.30 – 2.50	0.10	5 × ø		30°	2
	72800	0.40 – 2.50	0.10	8 × ø		30°	2
	73130	0.30 – 3.00	0.10	1.3 × ø		30°	3
	73200	0.30 – 2.90	0.10	2 × ø		30°	3

* S. 142 + 143
p. 142 + 143

✓ hervorragend / excellent / ottimamente / outstanding
• geeignet / approprié / adatto / suitable

Material	Werkstoffgruppe * Workpiece material * P	M	K	N	S	H	O	Anwendung * Application *	Seite Page
Fresa per incidere Engraving mill									
VHM / MD / SC	✓	✓	✓	✓	✓		✓		76
VHM / MD / SC	✓	✓	✓	✓	✓		✓		77
VHM / MD / SC	✓	✓	✓	✓	✓		✓		78
VHM / MD / SC	✓	✓	✓	✓	✓		✓		79
VHM / MD / SC	✓	✓	✓	✓	✓		✓		80
VHM / MD / SC	✓	✓	✓	✓	✓		✓		81
VHM / MD / SC	✓	✓	✓	✓	✓		✓		82
VHM / MD / SC	✓	✓	✓	✓	✓		✓		83
VHM / MD / SC	✓	✓	✓	✓	✓		✓		84
VHM / MD / SC	✓	✓	✓	✓	✓		✓		85
Micro fresa Micro endmill									
VHM / MD / SC	✓	•	✓	✓	•		•		86
VHM / MD / SC	✓	•	✓	✓	•		•		87
VHM / MD / SC	✓	•	✓	✓	•		•		88
VHM / MD / SC	✓	•	✓	✓	•		•		89
VHM / MD / SC	✓	•	✓	✓	•		•		90
VHM / MD / SC	✓	•	✓	•	•				91
VHM / MD / SC	✓	•	✓	•	•				92

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Incre-ments	Bearbei-tungstiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	Zähne-zahl Number of teeth	
	73300	0.30–2.90	0.10	3×ø		30°	3	
	73800	0.50–2.50	0.10	8×ø		30°	3	
	73725	0.30–2.90	0.10	2.5×ø		45°	3	
	43105	0.30–3.00	0.10	1×ø		35°	3	
	43305	0.30–3.00	0.10	3×ø		35°	3	
	74720	0.30–2.90	0.10	2×ø		40°	4	
	74740	0.40–2.90	0.10	4×ø		40°	4	
Radiusfräser **Fraise hémisphérique**								
	74075	0.20–2.00	0.10	0.75×ø		30°	2	
	74150	0.20–2.00	0.10	1.5×ø		30°	2	
	74300	0.20–2.80	0.10	3×ø		30°	2	
Fräser **Fraise**								
	40000	2.00–12.00	0.50	DIN 6528		30°	2	
	40002	2.00–12.00	0.50	DIN 6528		30°	3	
	40004	2.00–12.00	0.50	DIN 6528		30°	4	
	47000	3.00–20.00	1.00	1.5–4×ø		55°	2	
	47500	6.00–20.00	2.00	4–8×ø		55°	2	
	76300	1.50–6.00	0.50	1.5–4×ø		30°	3	

* S. 142 + 143
p. 142 + 143

✓ hervorragend / excellent / ottimamente / outstanding
• geeignet / approprié / adatto / suitable

Material	Werkstoffgruppe * Workpiece material *							Anwendung * Application *	Seite Page
	P	M	K	N	S	H	O		
VHM / MD / SC	✓	•	✓	•	•				93
VHM / MD / SC	✓	•	✓	✓	•				94
VHM / MD / SC	✓	✓	✓	•	✓				95
VHM / MD / SC; Cro-Nova	✓	✓	•	✓	✓	•	•		96
VHM / MD / SC; Cro-Nova	✓	✓	•	✓	✓	•	•		97
VHM / MD / SC	✓	✓	✓	•	•				98
VHM / MD / SC	✓	✓	✓	•	•				99
Fresa a raggio Ball nose Endmill									
VHM / MD / SC	✓	•	✓	✓	•		•		100
VHM / MD / SC	✓	•	✓	✓	•		•		101
VHM / MD / SC	✓	•	✓	✓	•		•		102
Fresa Endmill									
VHM / MD / SC	•		•	✓			•		103
VHM / MD / SC	✓	•	✓	✓					104
VHM / MD / SC	✓	•	✓						105
VHM / MD / SC				✓			•		106
VHM / MD / SC				✓			•		107
VHM / MD / SC	✓	•	✓						108

	Artikel Article	Durchmesser-Bereich Diameter range	Abstufung Incre-ments	Bearbei-tungstiefe Cutting length	Spitzen-winkel Point angle	Spiral-winkel Helix angle	Zähne-zahl Number of teeth	
Entgratfräser **Fraise à angler**								
	73000	0.50 – 8.00	0.50		90°		3 – 4	
	43400	1.00 – 6.00	0.50	4 × ø		12°	3	
Einzahnfräser **Fraise 1 dent**								
	71330	0.20 – 3.00	0.10				1	

* S. 142 + 143
p. 142 + 143

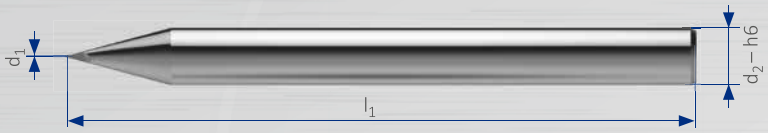
✓ hervorragend / excellent / ottimamente / outstanding
• geeignet / approprié / adatto / suitable

Material	Werkstoffgruppe * Workpiece material *							Anwendung * Application *	Seite Page
	P	M	K	N	S	H	O		
Fresa a smusso Chamfering tool									
VHM / MD / SC	✓	•	✓	✓	•				109
VHM / MD / SC; AlTiCrN+S	✓	✓	✓	✓	✓	•	✓		110
Fresa 1 dente Endmill 1 tooth									
VHM / MD / SC	•	•	•	✓	•		•		111

Gravierfräser
Fraise à graver
Fresa per incidere
Engraving mill

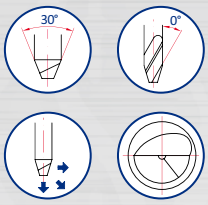
Art. 70030

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



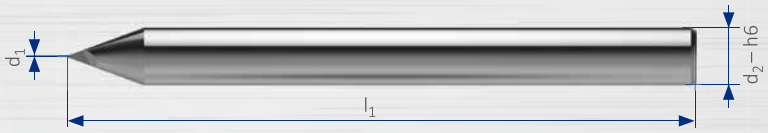
i 131

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
Fraise à graver
Fresa per incidere
Engraving mill

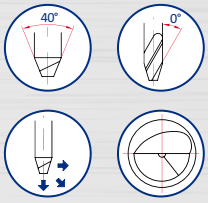
Art. 70040

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



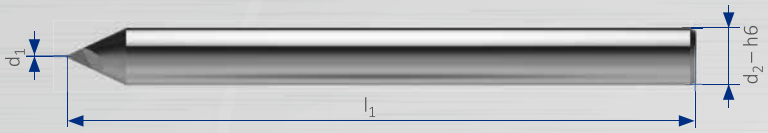
131

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
Fraise à graver
Fresa per incidere
Engraving mill

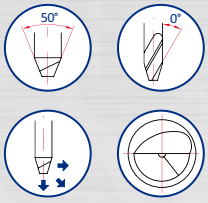
Art. 70050

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



131

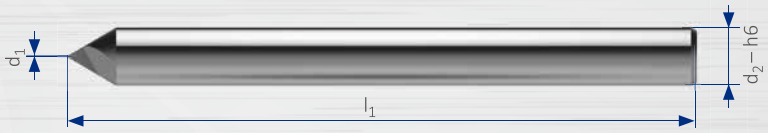
d_1 mm	α °	l_1 mm	d_2 mm
0.02	50	33	3.00
0.03	50	33	3.00
0.04	50	33	3.00
0.05	50	33	3.00
0.06	50	33	3.00
0.07	50	33	3.00
0.08	50	33	3.00
0.09	50	33	3.00
0.10	50	33	3.00
0.12	50	33	3.00
0.15	50	33	3.00

swiss made by SPHINX TOOLS

Gravierfräser
Fraise à graver
Fresa per incidere
Engraving mill

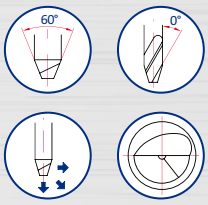
Art. 70060

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



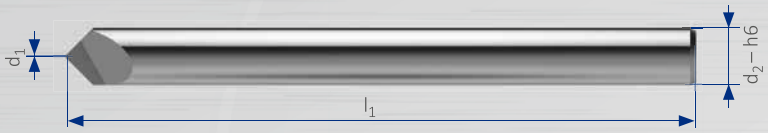
131

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
Fraise à graver
Fresa per incidere
Engraving mill

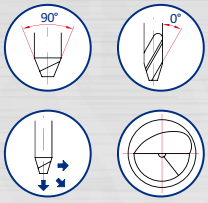
Art. 70090

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



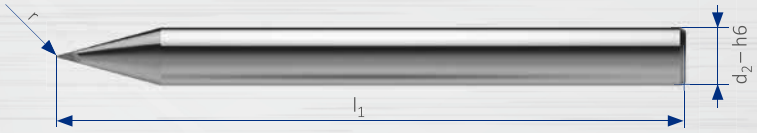
131

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
Fraise à graver
Fresa per incidere
Engraving mill

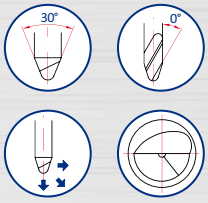
Art. 70130

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



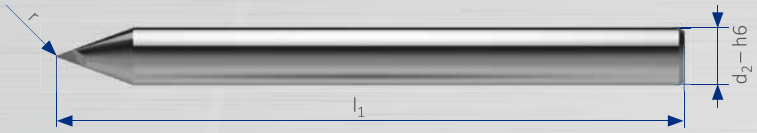
131

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
Fraise à graver
Fresa per incidere
Engraving mill

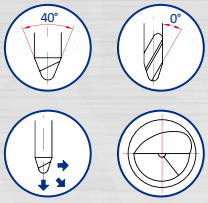
Art. 70140

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



131

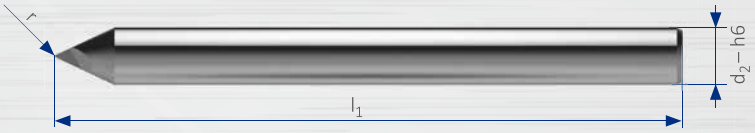
r mm	α °	l_1 mm	d_2 mm
0.04	40	33	3.00
0.05	40	33	3.00
0.06	40	33	3.00
0.07	40	33	3.00
0.08	40	33	3.00
0.09	40	33	3.00
0.10	40	33	3.00

swiss made by SPHINX TOOLS

Gravierfräser
Fraise à graver
Fresa per incidere
Engraving mill

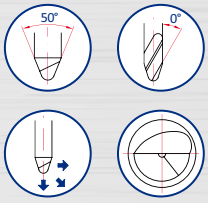
Art. 70150

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



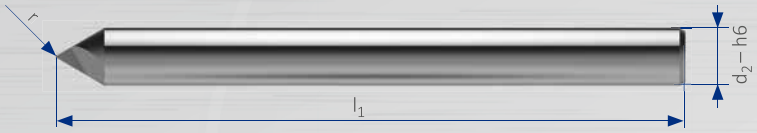
131

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
Fraise à graver
Fresa per incidere
Engraving mill

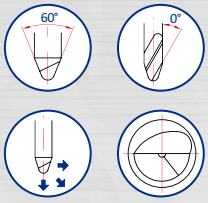
Art. 70160

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



131

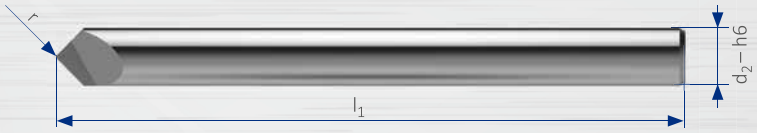
r mm	α °	l_1 mm	d_2 mm
0.04	60	33	3.00
0.05	60	33	3.00
0.06	60	33	3.00
0.07	60	33	3.00
0.08	60	33	3.00
0.09	60	33	3.00
0.10	60	33	3.00

swiss made by SPHINX TOOLS

Gravierfräser
Fraise à graver
Fresa per incidere
Engraving mill

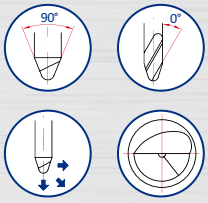
Art. 70190

P1–3 M1,2 K1,2 N1–8 S1 O1



VHM MD/SC

Z 1



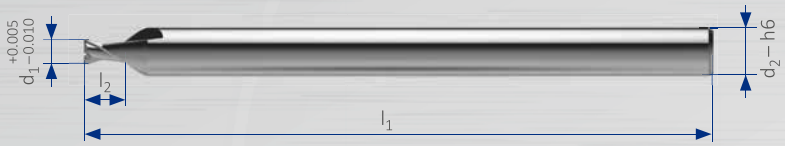
131

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
Micro fraise
Micro fresa
Micro endmill

Art. 72075

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2

30°

0,75×d

132

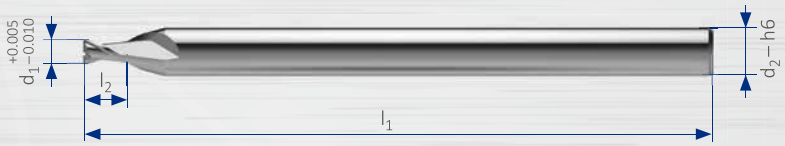
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.15	39	3.00
0.30	0.25	39	3.00
0.40	0.30	39	3.00
0.50	0.37	39	3.00
0.60	0.45	39	3.00
0.70	0.53	39	3.00
0.80	0.60	39	3.00
0.90	0.70	39	3.00
1.00	0.75	39	3.00
1.10	0.90	39	3.00
1.20	0.90	39	3.00
1.30	1.00	39	3.00
1.40	1.10	39	3.00
1.50	1.15	39	3.00
1.60	1.20	39	3.00
1.70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

swiss made by SPHINX TOOLS

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 72150

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2

30°

1,5×d

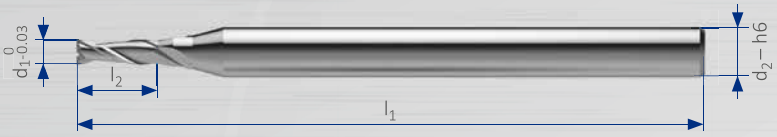
132

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
Micro fraise
Micro fresa
Micro endmill

Art. 42000

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2

30°

3xd

132

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.10	0.30	38	3.00
0.15	0.45	38	3.00
0.20	0.60	38	3.00
0.25	0.75	38	3.00
0.30	0.90	38	3.00
0.35	1.05	38	3.00
0.40	1.10	38	3.00
0.45	1.35	38	3.00
0.50	1.50	38	3.00
0.55	1.65	38	3.00
0.60	1.70	38	3.00
0.65	1.95	38	3.00
0.70	2.10	38	3.00
0.75	2.25	38	3.00
0.80	2.40	38	3.00
0.85	2.55	38	3.00
0.90	2.70	38	3.00
0.95	2.85	38	3.00
1.00	3.00	38	3.00
1.05	3.10	38	3.00
1.10	3.30	38	3.00
1.15	3.40	38	3.00
1.20	3.60	38	3.00
1.25	3.70	38	3.00
1.30	3.90	38	3.00
1.35	4.00	38	3.00
1.40	4.20	38	3.00
1.45	4.30	38	3.00
1.50	4.50	38	3.00
1.55	4.60	38	3.00
1.60	4.80	38	3.00
1.65	4.90	38	3.00
1.70	5.10	38	3.00
1.75	5.20	38	3.00
1.80	5.40	38	3.00
1.85	5.50	38	3.00
1.90	5.70	38	3.00
1.95	5.80	38	3.00

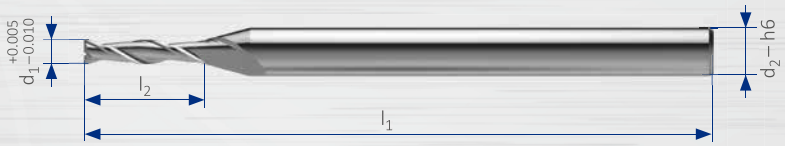
d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	6.00	38	3.00
2.10	6.30	38	3.00
2.20	6.60	38	3.00
2.30	6.90	38	3.00
2.40	7.20	38	3.00
2.50	7.50	38	3.00
2.60	7.80	38	3.00
2.70	8.10	38	3.00
2.80	8.40	38	3.00
2.90	8.70	38	3.00
3.00	9.00	38	3.00

swiss made by SPHINX TOOLS

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 72500

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2

30°

5xd

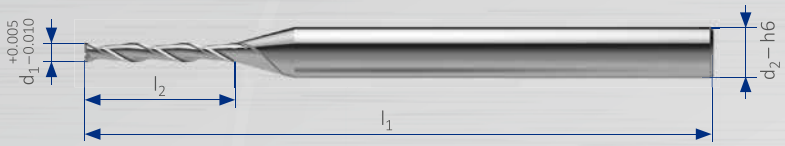
133

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
Micro fraise
Micro fresa
Micro endmill

Art. 72800

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2

133

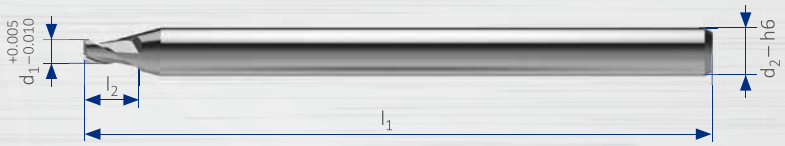
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.40	3.20	39	3.00
0.50	4.00	39	3.00
0.60	5.00	39	3.00
0.70	5.60	39	3.00
0.80	6.00	39	3.00
0.90	7.20	39	3.00
1.00	8.00	39	3.00
1.20	9.00	39	3.00
1.50	12.00	50	4.00
2.00	16.00	50	4.00
2.50	20.00	50	4.00

swiss made by SPHINX TOOLS

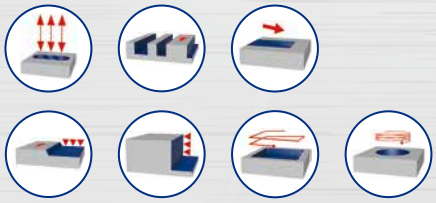
Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 73130

P1–3 | M1,2 | K1,2 | N2,3 | N5,6 | S1



VHM MD/SC | Z 3



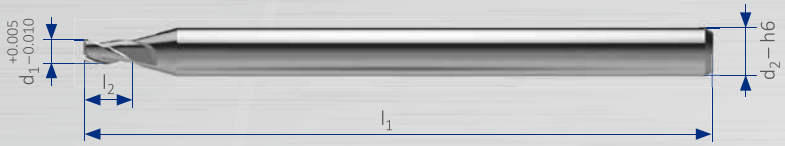
133

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
Micro fraise
Micro fresa
Micro endmill

Art. 73200

P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1



VHM MD/SC | Z 3

30° | 2×d

134

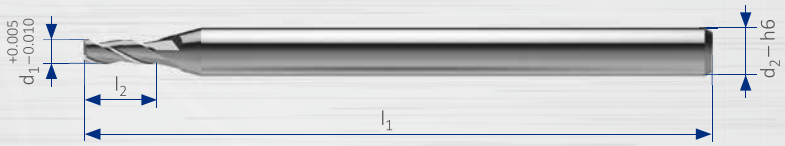
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.60	39	3.00
0.40	0.80	39	3.00
0.50	1.00	39	3.00
0.60	1.20	39	3.00
0.70	1.40	39	3.00
0.75	1.50	39	3.00
0.80	1.60	39	3.00
0.90	1.80	39	3.00
1.00	2.00	39	3.00
1.10	2.20	39	3.00
1.20	2.40	39	3.00
1.30	2.60	39	3.00
1.40	2.80	39	3.00
1.50	3.00	39	3.00
1.60	3.20	39	3.00
1.70	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

swiss made by SPHINX TOOLS

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 73300

P1–3 M1,2 K1,2 N1–3 N5,6 S1



VHM MD/SC

Z 3

30°

3xd

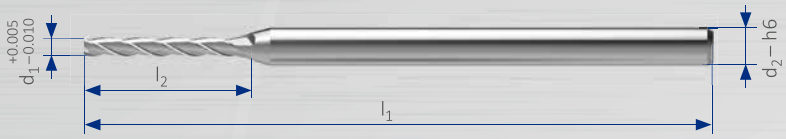
134

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
Micro fraise
Micro fresa
Micro endmill

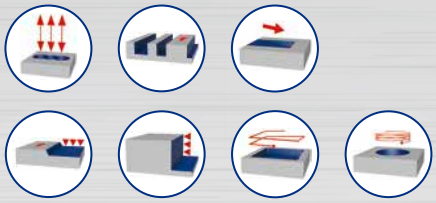
Art. 73800

P1–3 M1,2 K1,2 N1–3 N5,6 S1



VHM MD/SC

Z 3



134

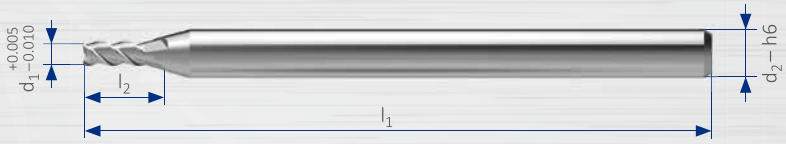
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.50	4.00	39	3.00
0.60	5.00	39	3.00
0.70	5.60	39	3.00
0.80	6.00	39	3.00
0.90	7.20	39	3.00
1.00	8.00	39	3.00
1.20	9.00	39	3.00
1.50	12.00	50	4.00
2.00	16.00	50	4.00
2.50	20.00	50	4.00

swiss made by SPHINX TOOLS

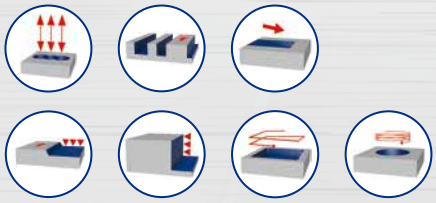
Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 73725

P1–3 | M1,2 | K1,2 | N1–3 | N5,6 | S1



VHM MD/SC | Z 3



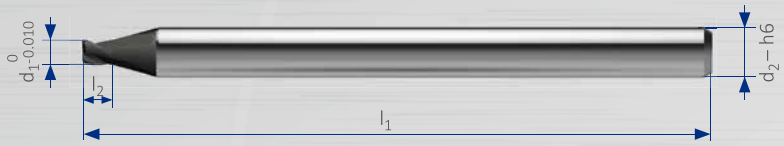
135

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.80	39	3.00
0.40	1.00	39	3.00
0.50	1.30	39	3.00
0.60	1.50	39	3.00
0.70	1.70	39	3.00
0.80	2.00	39	3.00
0.90	2.30	39	3.00
1.00	2.50	39	3.00
1.10	2.80	39	3.00
1.20	3.00	39	3.00
1.30	3.30	39	3.00
1.40	3.50	39	3.00
1.50	3.80	39	3.00
1.60	4.00	39	3.00
1.70	4.30	39	3.00
1.80	4.50	39	3.00
1.90	4.80	39	3.00
2.00	5.00	39	3.00
2.10	5.30	39	3.00
2.20	5.50	39	3.00
2.30	5.80	39	3.00
2.40	6.00	39	3.00
2.50	6.30	39	3.00
2.60	6.50	39	3.00
2.70	6.80	39	3.00
2.80	7.00	39	3.00
2.90	7.30	39	3.00

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 43105

P1–3 M1,2 K1,2 N1–8 S1,2 H1 O1



VHM MD/SC

Cro-Nova

Z 3

35°

1xd

135

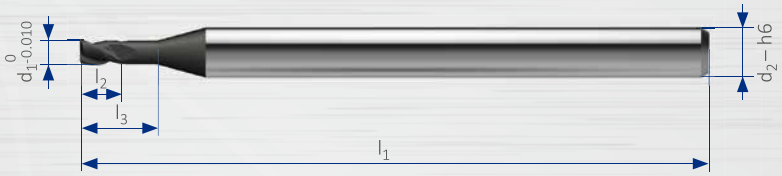
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.30	38	3.00
0.40	0.40	38	3.00
0.50	0.50	38	3.00
0.60	0.60	38	3.00
0.70	0.70	38	3.00
0.80	0.80	38	3.00
0.90	0.90	38	3.00
1.00	1.00	38	3.00
1.10	1.10	38	3.00
1.20	1.20	38	3.00
1.30	1.30	38	3.00
1.40	1.40	38	3.00
1.50	1.50	38	3.00
1.60	1.60	38	3.00
1.70	1.70	38	3.00
1.80	1.80	38	3.00
1.90	1.90	38	3.00
2.00	2.00	38	3.00
2.10	2.10	38	3.00
2.20	2.20	38	3.00
2.30	2.30	38	3.00
2.40	2.40	38	3.00
2.50	2.50	38	3.00
2.60	2.60	38	3.00
2.70	2.70	38	3.00
2.80	2.80	38	3.00
2.90	2.90	38	3.00
3.00	3.00	38	3.00

swiss made by SPHINX TOOLS

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 43305

P1–3 M1,2 K1,2 N1–8 S1,2 H1 O1



VHM MD/SC

Cro-Nova

Z 3

35°

3xd

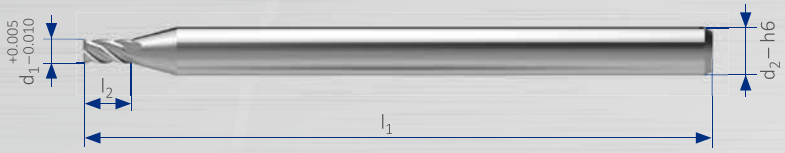
136

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm
0.30	0.30	0.90	38	3.00
0.40	0.40	1.20	38	3.00
0.50	0.50	1.50	38	3.00
0.60	0.60	1.80	38	3.00
0.70	0.70	2.10	38	3.00
0.80	0.80	2.40	38	3.00
0.90	0.90	2.70	38	3.00
1.00	1.00	3.00	38	3.00
1.10	1.10	3.30	38	3.00
1.20	1.20	3.60	38	3.00
1.30	1.30	3.90	38	3.00
1.40	1.40	4.20	38	3.00
1.50	1.50	4.50	38	3.00
1.60	1.60	4.80	38	3.00
1.70	1.70	5.10	38	3.00
1.80	1.80	5.40	38	3.00
1.90	1.90	5.70	38	3.00
2.00	2.00	6.00	38	3.00
2.10	2.10	6.30	38	3.00
2.20	2.20	6.60	38	3.00
2.30	2.30	6.90	38	3.00
2.40	2.40	7.20	38	3.00
2.50	2.50	7.50	38	3.00
2.60	2.60	7.80	38	3.00
2.70	2.70	8.10	38	3.00
2.80	2.80	8.40	38	3.00
2.90	2.90	8.70	38	3.00
3.00	3.00	9.00	38	3.00

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

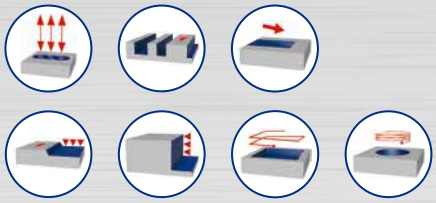
Art. 74720

P1–3 M1,2 K1,2 N1–3 N5,6 S1



VHM MD/SC

Z 4



136

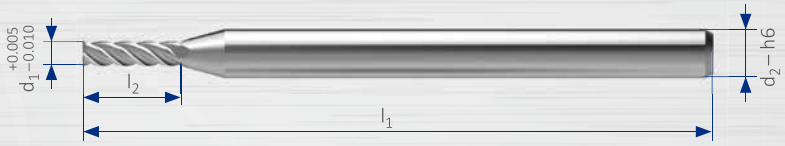
d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.30	0.60	39	3.00
0.40	0.80	39	3.00
0.50	1.00	39	3.00
0.60	1.20	39	3.00
0.70	1.40	39	3.00
0.80	1.60	39	3.00
0.90	1.80	39	3.00
1.00	2.00	39	3.00
1.10	2.20	39	3.00
1.20	2.40	39	3.00
1.30	2.60	39	3.00
1.40	2.80	39	3.00
1.50	3.00	39	3.00
1.60	3.20	39	3.00
1.70	3.40	39	3.00
1.80	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

swiss made by SPHINX TOOLS

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

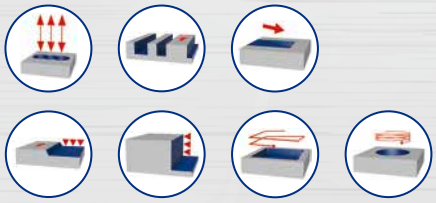
Art. 74740

P1–3 M1,2 K1,2 N1–3 N5,6 S1



VHM MD/SC

Z 4



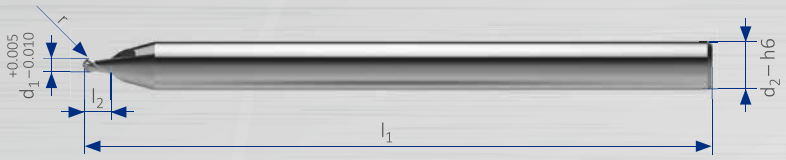
137

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.40	1.60	39	3.00
0.50	2.00	39	3.00
0.60	2.40	39	3.00
0.70	2.80	39	3.00
0.80	3.20	39	3.00
0.90	3.60	39	3.00
1.00	4.00	39	3.00
1.10	4.40	39	3.00
1.20	4.80	39	3.00
1.30	5.20	39	3.00
1.40	5.60	39	3.00
1.50	6.00	39	3.00
1.60	6.40	39	3.00
1.70	6.80	39	3.00
1.80	7.20	39	3.00
1.90	7.60	39	3.00
2.00	8.00	39	3.00
2.10	8.40	39	3.00
2.20	8.80	39	3.00
2.30	9.20	39	3.00
2.40	9.60	39	3.00
2.50	10.00	39	3.00
2.60	10.40	39	3.00
2.70	10.80	39	3.00
2.80	11.20	39	3.00
2.90	11.60	39	3.00

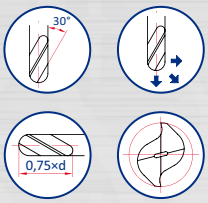
Radiusfräser
Fraise hémisphérique
Fresa a raggio
Ball nose Endmill

Art. 74075

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



VHM MD/SC | Z 2



137

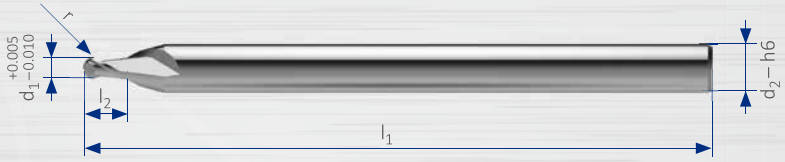
d_1 mm	r mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.10	0.15	39	3.00
0.30	0.15	0.20	39	3.00
0.40	0.20	0.30	39	3.00
0.50	0.25	0.37	39	3.00
0.60	0.30	0.45	39	3.00
0.80	0.40	0.60	39	3.00
1.00	0.50	0.75	39	3.00
1.20	0.60	0.90	39	3.00
1.50	0.75	1.15	39	3.00
1.80	0.90	1.35	39	3.00
2.00	1.00	1.50	39	3.00

swiss made by SPHINX TOOLS

Radiusfräser
Fraise hémisphérique
Fresa a raggio
Ball nose Endmill

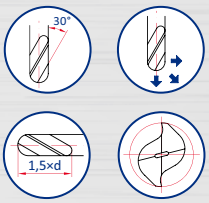
Art. 74150

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2



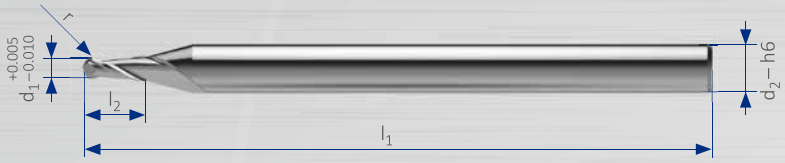
137

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
Fraise hémisphérique
Fresa a raggio
Ball nose Endmill

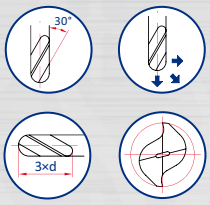
Art. 74300

P1–3 M1,2 K1,2 N1–3 N5,6 S1 O1



VHM MD/SC

Z 2



137

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

swiss made by SPHINX TOOLS

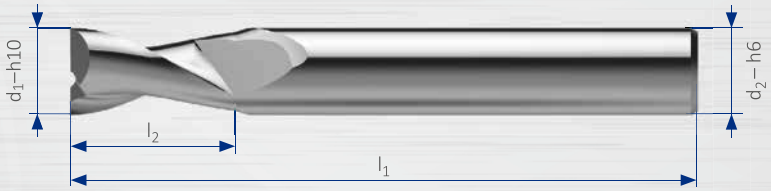
Fräser
Fraise
Fresa
Endmill

Art. 40000

P1,2

K1,2

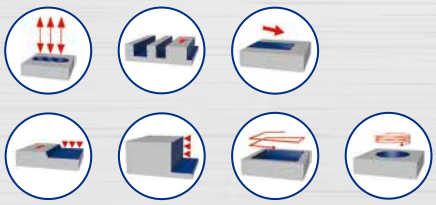
N1–6



VHM MD/SC

DIN 6528

Z 2



138

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
6.00	10.00	57	6.00
8.00	16.00	63	8.00
10.00	19.00	72	10.00
12.00	22.00	83	12.00

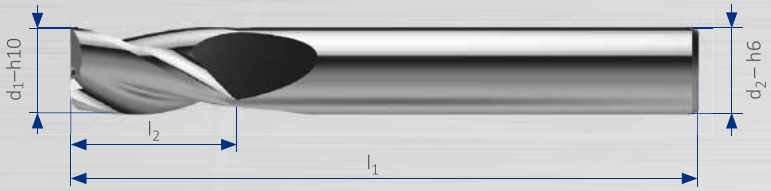
Fräser
Fraise
Fresa
Endmill

Art. 40002

P1–3

M1

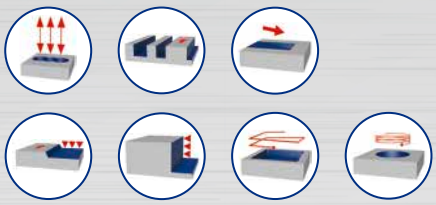
K1,2



VHM MD/SC

DIN 6528

Z 3



138

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
6.00	10.00	57	6.00
8.00	16.00	63	8.00
10.00	19.00	72	10.00
12.00	22.00	83	12.00

swiss made by SPHINX TOOLS

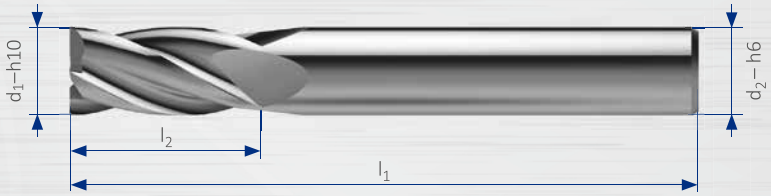
Fräser
Fraise
Fresa
Endmill

Art. 40004

P1–3

M1

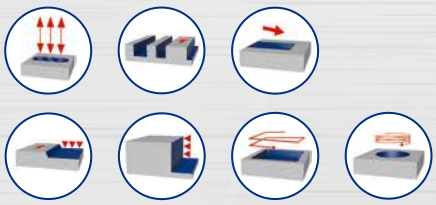
K1,2



VHM MD/SC

DIN 6528

Z 4



139

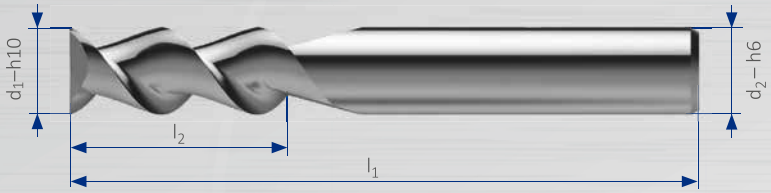
d_1 mm	l_2 mm	l_1 mm	d_2 mm
2.00	10.00	50	2.00
2.50	10.00	50	2.50
3.00	10.00	50	3.00
3.50	10.00	50	3.50
4.00	11.00	50	4.00
4.50	11.00	50	4.50
5.00	13.00	50	5.00
6.00	13.00	57	6.00
8.00	19.00	63	8.00
10.00	22.00	72	10.00
12.00	26.00	83	12.00

Fräser AC2
Fraise AC2
Fresa AC2
Endmill AC2

Art. 47000

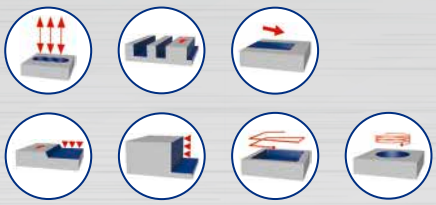
N1–3

O1



VHM MD/SC

Z 2



139

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

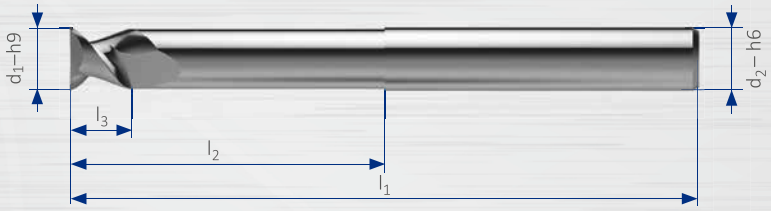
swiss made by SPHINX TOOLS

Fräser ACL2
Fraise ACL2
Fresa ACL2
Endmill ACL2

Art. 47500

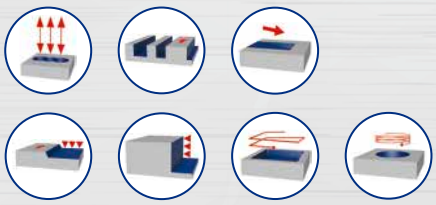
N1–3

O1



VHM MD/SC

Z 2



i 139

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

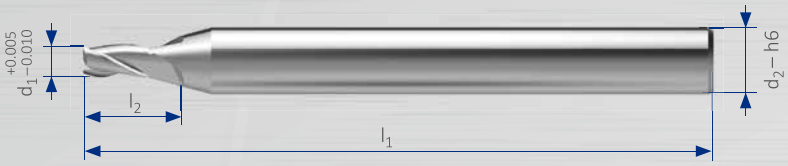
Fräser
Fraise
Fresa
Endmill

Art. 76300

P1–3

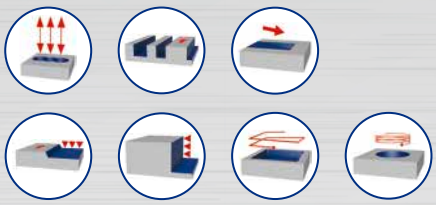
M1

K1,2



VHM MD/SC

Z 3



140

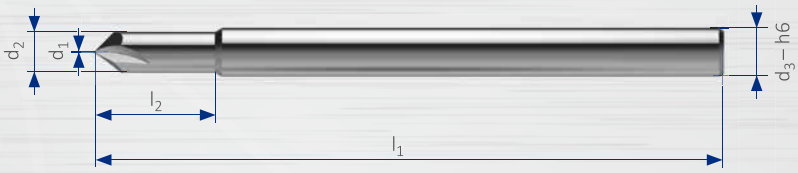
d_1 mm	l_2 mm	l_1 mm	d_2 mm
1.50	6.00	57	6.00
2.00	6.00	57	6.00
2.50	6.00	57	6.00
3.00	7.00	57	6.00
3.50	7.00	57	6.00
4.00	8.00	57	6.00
4.50	8.00	57	6.00
5.00	10.00	57	6.00
5.50	10.00	57	6.00
6.00	10.00	57	6.00

swiss made by SPHINX TOOLS

Entgratfräser
Fraise à angler
Fresa a smusso
Chamfering tool

Art. 73000

P1–3 M1,2 K1,2 N1–5 N7,8 S1



VHM MD/SC

Z 3/4

90°

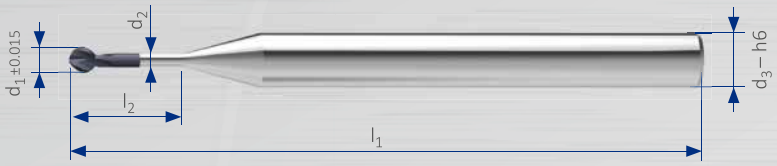
140

d_1 mm	d_2 mm	l_2 mm	l_1 mm	d_3 mm	z
0.10	0.50	3.00	39	3.00	3
0.10	1.00	3.00	39	3.00	3
0.10	1.50	4.50	39	3.00	3
0.10	2.00	6.00	39	3.00	3
0.10	2.50	7.50	39	3.00	3
0.10	3.00	7.50	39	3.00	3
0.70	6.00		50	6.00	4
1.20	8.00		60	8.00	4

Entgratfräser Lollipop
Fraise à angler Lollipop
Fresa a smusso Lollipop
Chamfering tool Lollipop

Art. 43400

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



VHM MD/SC | AlTiCrN+S | Z 3 | 12°

141

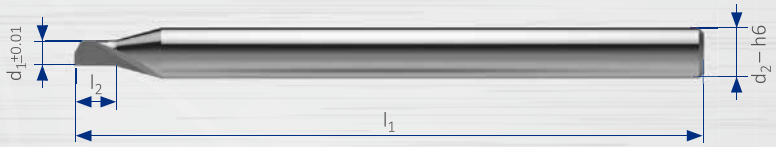
d_1 mm	d_2 mm	l_2 mm	l_1 mm	d_3 mm
1.00	0.60	4.00	60	4.00
1.50	0.90	6.00	60	4.00
2.00	1.20	8.00	60	4.00
2.50	1.35	10.00	70	6.00
3.00	1.50	12.00	70	6.00
4.00	2.00	16.00	70	6.00
5.00	2.50	20.00	80	8.00
6.00	3.00	24.00	80	8.00

swiss made by SPHINX TOOLS

Einzahnfräser
Fraise 1 dent
Fresa 1 dente
Endmill 1 tooth

Art. 71330

P1,2 M1,2 K1,2 N2,3 N5,7,8 S1 O1



VHM MD/SC

Z 1

141

d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.20	0.40	39	3.00
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
0.80	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
3.00	6.00	40	4.00

Anwendungstechnik
Application de la technologie
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Formeln
Formules
Formule
Formulas

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, Reibahle
Forets, alésoir
Punte, alesatori
Drill, reamer

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

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

Fräser
Fraises
Frese
Endmill

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

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

V_f =	Vorschubgeschwindigkeit in mm / min	$f_z \times z \times n$
	Avance en mm / min	$f_z \times d \times n$
	Avanzamento in mm / min	$f_z \times d \times n$
	Cutting speed in mm / min	$f_z \times t \times n$

a_p = Schnitttiefe
Profondeur de coupe
Profondità di taglio
Cutting depth

a_e = Schnittbreite
Largeur de coupe
Larghezza di taglio
Cutting width

Schnittdaten
Données de coupe
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Cutting data

Art. 50806 / 50809

Mat.		ø 0.50–1.00	ø 1.10–2.90	ø 3.00–6.00
P1	Vc	15–25	25–40	25–40
	f	0.020–0.080	0.060–0.140	0.120–0.250
P2	Vc	12–20	20–35	20–35
	f	0.010–0.060	0.040–0.120	0.100–0.220
P3	Vc	8–18	12–30	12–30
	f	0.010–0.040	0.030–0.090	0.080–0.200
M1	Vc	6–12	10–20	10–20
	f	0.020–0.050	0.030–0.070	0.050–0.150
M2	Vc	5–10	8–16	8–16
	f	0.010–0.040	0.030–0.060	0.040–0.080
K1	Vc	15–25	25–40	25–40
	f	0.010–0.050	0.030–0.080	0.070–0.150
K2	Vc	12–20	20–35	20–35
	f	0.010–0.040	0.030–0.060	0.050–0.100
N1	Vc	30–45	45–60	45–60
	f	0.030–0.080	0.060–0.120	0.100–0.250
N2	Vc	20–35	30–45	30–45
	f	0.040–0.080	0.070–0.150	0.130–0.300
N3	Vc	15–30	25–40	25–40
	f	0.020–0.070	0.060–0.120	0.100–0.250
N4	Vc	15–25	25–40	25–40
	f	0.010–0.050	0.030–0.080	0.060–0.150
N5	Vc	30–45	45–60	45–60
	f	0.040–0.080	0.070–0.130	0.100–0.250
N6	Vc	15–30	25–40	25–40
	f	0.010–0.040	0.038–0.065	0.060–0.090
N7	Vc	15–25	25–40	25–40
	f	0.010–0.040	0.030–0.080	0.050–0.130
N8	Vc	8–18	12–30	12–30
	f	0.010–0.040	0.020–0.050	0.030–0.100
S1	Vc	20–35	30–45	30–45
	f	0.010–0.040	0.020–0.056	0.040–0.100
S2	Vc			
	f			
H1	Vc			
	f			
H2	Vc			
	f			
H3	Vc			
	f			
O1	Vc	20–35	30–45	30–45
	f	0.020–0.060	0.050–0.120	0.100–0.250
O2	Vc			
	f			
O3	Vc			
	f			

Art. 50808

Mat.		ø 0.50–1.00	ø 1.10–2.00	ø 2.10–3.00
P1	Vc	20–35	35–50	35–50
	f	0.010–0.030	0.030–0.050	0.050–0.070
P2	Vc	15–30	30–45	30–45
	f	0.010–0.025	0.025–0.045	0.045–0.065
P3	Vc	12–25	25–40	25–40
	f	0.010–0.020	0.020–0.040	0.040–0.060
M1	Vc	10–20	20–35	20–35
	f	0.010–0.020	0.020–0.035	0.035–0.045
M2	Vc	8–16	16–30	16–30
	f	0.010–0.020	0.020–0.030	0.030–0.040
K1	Vc	20–35	35–50	35–50
	f	0.010–0.035	0.035–0.055	0.055–0.075
K2	Vc	15–30	30–45	30–45
	f	0.010–0.030	0.030–0.050	0.050–0.070
N1	Vc	35–50	50–65	50–65
	f	0.020–0.040	0.040–0.060	0.060–0.080
N2	Vc	25–40	40–55	40–55
	f	0.020–0.050	0.050–0.070	0.070–0.090
N3	Vc	20–35	35–50	35–50
	f	0.020–0.040	0.040–0.060	0.060–0.080
N4	Vc	15–30	30–45	30–45
	f	0.010–0.030	0.030–0.050	0.050–0.070
N5	Vc	35–50	50–65	50–65
	f	0.020–0.050	0.050–0.070	0.070–0.090
N6	Vc	20–35	35–50	35–50
	f	0.010–0.030	0.030–0.050	0.050–0.070
N7	Vc	15–30	30–45	30–45
	f	0.010–0.025	0.025–0.045	0.045–0.065
N8	Vc	10–20	20–35	20–35
	f	0.010–0.020	0.020–0.030	0.030–0.040
S1	Vc	25–35	35–50	35–50
	f	0.010–0.030	0.030–0.050	0.050–0.070
S2	Vc	10–15	15–25	15–25
	f	0.010–0.020	0.020–0.035	0.035–0.050
H1	Vc	10–15	15–25	15–25
	f	0.010–0.020	0.020–0.030	0.030–0.040
H2	Vc			
	f			
H3	Vc			
	f			
O1	Vc	20–35	30–45	30–45
	f	0.020–0.050	0.050–0.075	0.075–0.100
O2	Vc	20–35	30–45	30–45
	f	0.015–0.035	0.035–0.055	0.055–0.080
O3	Vc			
	f			

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.
These are recommended values that depend on the condition of the machine, fixture, coolant etc., and they may have to be adapted yet.

Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

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	0.120–0.250	0.250–0.300	0.300–0.400
P2	v_c	20–35	20–35	20–35
	f	0.100–0.200	0.200–0.250	0.250–0.300
P3	v_c	10–30	10–30	10–30
	f	0.008–0.150	0.150–0.220	0.220–0.300
M1	v_c	10–20	10–20	10–20
	f	0.050–0.150	0.150–0.200	0.200–0.250
M2	v_c	8–16	8–16	8–16
	f	0.040–0.080	0.080–0.140	0.140–0.200
K1	v_c	25–40	25–40	25–40
	f	0.070–0.150	0.150–0.200	0.200–0.350
K2	v_c	20–35	20–35	20–35
	f	0.050–0.100	0.100–0.150	0.150–0.250
N1	v_c	45–60	45–60	45–60
	f	0.100–0.250	0.250–0.350	0.350–0.400
N2	v_c	30–45	30–45	30–45
	f	0.150–0.300	0.300–0.400	0.400–0.600
N3	v_c	25–40	25–40	25–40
	f	0.100–0.250	0.250–0.350	0.350–0.550
N4	v_c	25–40	25–40	25–40
	f	0.060–0.150	0.150–0.250	0.250–0.400
N5	v_c	45–60	45–60	45–60
	f	0.100–0.250	0.250–0.350	0.350–0.450
N6	v_c	25–40	25–40	25–40
	f	0.060–0.100	0.100–0.150	0.150–0.250
N7	v_c	25–40	25–40	25–40
	f	0.050–0.150	0.150–0.250	0.250–0.350
N8	v_c	12–30	12–30	12–30
	f	0.030–0.100	0.100–0.150	0.150–0.200
S1	v_c	30–45	30–45	30–45
	f	0.040–0.150	0.150–0.200	0.200–0.300
S2	v_c			
	f			
H1	v_c			
	f			
H2	v_c			
	f			
H3	v_c			
	f			
O1	v_c	30–45	30–45	30–45
	f	0.100–0.250	0.250–0.400	0.400–0.800
O2	v_c			
	f			
O3	v_c			
	f			

Art. 50811 / 50813 / 50815

Mat.		ø 2.00–4.00	ø 4.00–6.00	ø 6.00–12.00
P1	v_c	40–60	40–60	40–60
	f	0.120–0.250	0.250–0.300	0.300–0.400
P2	v_c	35–55	35–55	35–55
	f	0.100–0.200	0.200–0.250	0.250–0.300
P3	v_c	30–45	30–45	30–45
	f	0.008–0.150	0.150–0.220	0.220–0.300
M1	v_c	25–40	25–40	25–40
	f	0.050–0.150	0.150–0.200	0.200–0.250
M2	v_c	20–35	20–35	20–35
	f	0.040–0.080	0.080–0.140	0.140–0.200
K1	v_c	35–50	35–50	35–50
	f	0.070–0.150	0.150–0.200	0.200–0.350
K2	v_c	30–45	30–45	30–45
	f	0.050–0.100	0.100–0.150	0.150–0.250
N1	v_c	60–70	60–70	60–70
	f	0.100–0.250	0.250–0.350	0.350–0.400
N2	v_c	50–60	50–60	50–60
	f	0.150–0.300	0.300–0.400	0.400–0.600
N3	v_c	40–55	40–55	40–55
	f	0.100–0.250	0.250–0.350	0.350–0.550
N4	v_c	35–50	35–50	35–50
	f	0.060–0.150	0.150–0.250	0.250–0.400
N5	v_c	60–70	60–70	60–70
	f	0.100–0.250	0.250–0.350	0.350–0.450
N6	v_c	40–55	40–55	40–55
	f	0.060–0.100	0.100–0.150	0.150–0.250
N7	v_c	35–50	35–50	35–50
	f	0.050–0.150	0.150–0.250	0.250–0.350
N8	v_c	25–40	25–40	25–40
	f	0.030–0.100	0.100–0.150	0.150–0.200
S1	v_c	35–50	35–50	35–50
	f	0.040–0.150	0.150–0.200	0.200–0.300
S2	v_c	15–25	15–25	15–25
	f	0.030–0.100	0.100–0.150	0.150–0.200
H1	v_c	15–25	15–25	15–25
	f	0.040–0.060	0.060–0.080	0.080–0.120
H2	v_c			
	f			
H3	v_c			
	f			
O1	v_c	30–45	30–45	30–45
	f	0.100–0.250	0.250–0.400	0.400–0.800
O2	v_c	30–45	30–45	30–45
	f	0.080–0.200	0.200–0.350	0.350–0.600
O3	v_c			
	f			

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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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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 56005

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

Art. 56033

Mat.		ø 0.03–0.10	ø 0.11–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–3.00
P1	Vc	1.5–5	4–10	10–30	30–60	30–60
	f	0.001–0.003	0.002–0.010	0.010–0.018	0.018–0.028	0.028–0.045
P2	Vc	1.2–4	3.5–8	8–25	25–50	25–50
	f	0.001–0.002	0.002–0.008	0.008–0.016	0.016–0.026	0.026–0.040
P3	Vc	1–3	3–6	6–20	20–45	20–45
	f	0.001–0.002	0.002–0.007	0.007–0.013	0.013–0.024	0.024–0.035
M1	Vc	1.2–4	3.5–8	8–20	20–45	20–45
	f	0.001–0.002	0.002–0.007	0.007–0.013	0.013–0.023	0.023–0.033
M2	Vc	1–3	3–6	5–15	15–30	15–30
	f	0.001–0.002	0.002–0.005	0.005–0.010	0.010–0.020	0.020–0.030
K1	Vc	1.5–5	4–10	10–30	30–60	30–60
	f	0.001–0.004	0.004–0.008	0.008–0.015	0.015–0.030	0.030–0.045
K2	Vc	1.2–4	3.5–8	8–25	25–50	25–50
	f	0.001–0.003	0.003–0.007	0.007–0.013	0.013–0.025	0.025–0.040
N1	Vc	2–6	5–15	15–40	40–70	40–70
	f	0.001–0.003	0.003–0.006	0.006–0.012	0.012–0.023	0.023–0.035
N2	Vc	1.8–5.5	5–15	15–40	40–65	40–65
	f	0.001–0.003	0.003–0.007	0.007–0.013	0.013–0.025	0.025–0.040
N3	Vc	1.5–5	4–12	12–30	30–60	30–60
	f	0.001–0.002	0.002–0.006	0.006–0.011	0.011–0.022	0.022–0.035
N4	Vc	1.5–5	4–12	12–30	30–60	30–60
	f	0.001–0.002	0.002–0.005	0.005–0.010	0.010–0.020	0.020–0.030
N5	Vc	2–6	5–15	15–35	35–65	35–65
	f	0.001–0.003	0.003–0.006	0.006–0.013	0.013–0.025	0.025–0.040
N6	Vc	1.5–5	4–12	12–30	30–60	30–60
	f	0.001–0.002	0.002–0.004	0.004–0.010	0.010–0.022	0.022–0.035
N7	Vc	1.5–5	4–12	12–30	30–60	30–60
	f	0.001–0.002	0.002–0.004	0.004–0.009	0.009–0.020	0.020–0.031
N8	Vc	1–3	3–6	6–20	20–45	20–45
	f	0.001–0.002	0.002–0.004	0.004–0.008	0.008–0.016	0.016–0.027
S1	Vc	0.8–5	4–7	7–15	15–30	15–30
	f	0.001–0.002	0.002–0.004	0.004–0.009	0.009–0.018	0.018–0.030
S2	Vc					
	f					
H1	Vc					
	f					
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc	1.5–5	4–10	10–25	20–35	30–60
	f	0.001–0.003	0.003–0.008	0.008–0.014	0.014–0.035	0.035–0.060
O2	Vc					
	f					
O3	Vc					
	f					

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. 56036

Mat.		ø 0.30–0.95	ø 1.00–1.95	ø 2.00–2.95	ø 3.00–3.95	ø 4.00–6.00
P1	Vc	40–60	60–90	60–90	60–90	60–90
	f	0.010–0.025	0.025–0.040	0.040–0.055	0.055–0.070	0.070–0.100
P2	Vc	30–50	50–70	50–70	50–70	50–70
	f	0.009–0.023	0.023–0.036	0.036–0.050	0.050–0.065	0.065–0.080
P3	Vc	20–40	40–60	40–60	40–60	40–60
	f	0.006–0.015	0.015–0.025	0.025–0.040	0.040–0.055	0.055–0.070
M1	Vc	20–35	35–50	35–50	35–50	35–50
	f	0.005–0.013	0.013–0.023	0.023–0.035	0.035–0.050	0.050–0.065
M2	Vc	20–30	30–45	30–45	30–45	30–45
	f	0.004–0.010	0.010–0.020	0.020–0.032	0.032–0.046	0.046–0.060
K1	Vc	60–100	100–150	100–150	100–150	100–150
	f	0.015–0.025	0.025–0.038	0.038–0.055	0.055–0.075	0.075–0.130
K2	Vc	40–80	80–130	80–130	80–130	80–130
	f	0.012–0.022	0.022–0.035	0.035–0.050	0.050–0.070	0.070–0.090
N1	Vc	60–90	90–120	90–120	90–120	90–120
	f	0.015–0.025	0.025–0.035	0.035–0.050	0.050–0.070	0.070–0.085
N2	Vc	70–120	120–150	120–150	120–150	120–150
	f	0.016–0.027	0.027–0.042	0.042–0.060	0.060–0.080	0.080–0.110
N3	Vc	70–120	120–150	120–150	120–150	120–150
	f	0.015–0.025	0.025–0.035	0.035–0.050	0.050–0.070	0.070–0.085
N4	Vc	40–70	70–100	70–100	70–100	70–100
	f	0.013–0.023	0.023–0.033	0.033–0.045	0.045–0.060	0.060–0.080
N5	Vc	70–120	120–150	120–150	120–150	120–150
	f	0.015–0.025	0.025–0.035	0.035–0.050	0.050–0.070	0.070–0.100
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc	30–40	40–70	40–70	40–70	40–70
	f	0.010–0.022	0.022–0.035	0.035–0.050	0.050–0.070	0.070–0.090
S2	Vc					
	f					
H1	Vc	15–25	20–35	20–35	20–35	20–35
	f	0.005–0.010	0.010–0.020	0.020–0.030	0.030–0.040	0.040–0.055
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

Art. 16004

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

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

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	Vc	1.0–6.0	6.0–15	10–23	23–60	23–60
	f	0.001–0.004	0.003–0.008	0.007–0.013	0.012–0.018	0.016–0.025
P2	Vc	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f	0.001–0.003	0.002–0.007	0.006–0.012	0.010–0.016	0.014–0.022
P3	Vc	0.5–5.0	1.0–8.0	2.5–13	5.0–25	5.0–25
	f	0.001–0.002	0.002–0.006	0.005–0.010	0.008–0.014	0.012–0.020
M1	Vc	0.5–3.0	1.0–6.0	4.0–10	8.0–18	8.0–18
	f	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.012	0.010–0.016
M2	Vc					
	f					
K1	Vc	2.0–8.0	6.0–15	10–23	23–60	23–60
	f	0.001–0.004	0.003–0.008	0.007–0.013	0.012–0.018	0.016–0.025
K2	Vc	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f	0.001–0.003	0.002–0.007	0.006–0.012	0.010–0.016	0.014–0.022
N1	Vc					
	f					
N2	Vc	3.0–16	8.0–26	13–55	30–100	30–100
	f	0.001–0.004	0.004–0.007	0.007–0.011	0.010–0.016	0.015–0.022
N3	Vc	2.5–13	6.0–22	10–40	20–80	20–80
	f	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N4	Vc	2.0–8.0	6.0–15	10–23	23–60	23–60
	f	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.017	0.010–0.016
N5	Vc	3.0–16	8.0–26	13–55	30–100	30–100
	f	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N6	Vc					
	f					
N7	Vc	2.0–8.0	6.0–15	10–23	23–60	23–60
	f	0.001–0.004	0.004–0.006	0.005–0.010	0.009–0.015	0.014–0.020
N8	Vc	1.0–6.0	2.0–10	3.5–16	7.0–30	7.0–30
	f	0.001–0.002	0.002–0.005	0.004–0.008	0.007–0.010	0.008–0.013
S1	Vc					
	f					
S2	Vc					
	f					
H1	Vc					
	f					
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

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

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 51201

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

Art. 50621

Mat.		ø 0.20–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–3.00
P1	Vc	6–15	15–35	15–35	15–35
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
P2	Vc	5–13	13–30	13–30	13–30
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
P3	Vc	4–12	12–25	12–25	12–25
	f	0.001–0.007	0.007–0.016	0.016–0.025	0.025–0.038
M1	Vc	4–12	12–25	12–25	12–25
	f	0.001–0.007	0.007–0.016	0.016–0.025	0.025–0.038
M2	Vc				
	f				
K1	Vc	6–15	15–35	15–35	15–35
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
K2	Vc	5–13	13–30	13–30	13–30
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
N1	Vc				
	f				
N2	Vc	8–20	20–45	20–45	20–45
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
N3	Vc	6–18	18–40	18–40	18–40
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
N4	Vc				
	f				
N5	Vc	6–18	18–40	18–40	18–40
	f	0.001–0.010	0.010–0.020	0.020–0.035	0.035–0.060
N6	Vc				
	f				
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc				
	f				
S2	Vc				
	f				
H1	Vc				
	f				
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc				
	f				
O2	Vc				
	f				
O3	Vc				
	f				

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 50622

Mat.		ø 0.20–0.50	ø 0.51–1.00	ø 1.01–2.00	ø 2.01–3.00
P1	Vc	8–20	20–40	20–40	20–40
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
P2	Vc	6–18	18–38	18–38	18–38
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
P3	Vc	5–14	14–30	14–30	14–30
	f	0.001–0.007	0.007–0.016	0.016–0.025	0.025–0.038
M1	Vc	5–14	14–30	14–30	14–30
	f	0.001–0.007	0.007–0.016	0.016–0.025	0.025–0.038
M2	Vc				
	f				
K1	Vc	8–20	20–40	20–40	20–40
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
K2	Vc	6–18	18–38	18–38	18–38
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
N1	Vc				
	f				
N2	Vc	10–25	25–55	25–55	25–55
	f	0.001–0.010	0.010–0.020	0.020–0.030	0.030–0.045
N3	Vc	8–22	22–50	22–50	22–50
	f	0.001–0.008	0.008–0.018	0.018–0.028	0.028–0.042
N4	Vc				
	f				
N5	Vc	8–22	22–50	22–50	22–50
	f	0.001–0.010	0.010–0.020	0.020–0.035	0.035–0.060
N6	Vc				
	f				
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc				
	f				
S2	Vc				
	f				
H1	Vc	2–5	5–12	5–12	5–12
	f	0.001–0.004	0.004–0.008	0.008–0.015	0.015–0.025
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc				
	f				
O2	Vc				
	f				
O3	Vc				
	f				

Art. 12604

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

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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. 50720

Mat.		ø 0.20–0.50	ø 0.55–0.80	ø 0.85–1.20	ø 1.25–2.00
P1	Vc	8–20	20–40	20–40	20–40
	f	0.001–0.010	0.010–0.018	0.018–0.025	0.025–0.035
P2	Vc	6–18	18–38	18–38	18–38
	f	0.001–0.008	0.008–0.016	0.016–0.023	0.023–0.033
P3	Vc	5–14	14–30	14–30	14–30
	f	0.001–0.007	0.007–0.015	0.015–0.020	0.020–0.030
M1	Vc	5–14	14–30	14–30	14–30
	f	0.001–0.008	0.008–0.016	0.016–0.023	0.023–0.033
M2	Vc	3–12	12–25	12–25	12–25
	f	0.001–0.005	0.005–0.010	0.010–0.016	0.016–0.020
K1	Vc	8–20	20–40	20–40	20–40
	f	0.001–0.010	0.010–0.018	0.018–0.025	0.025–0.035
K2	Vc	6–18	6–18	6–18	6–18
	f	0.001–0.008	0.008–0.016	0.016–0.023	0.023–0.033
N1	Vc	6–18	18–38	18–38	18–38
	f	0.001–0.007	0.007–0.015	0.015–0.020	0.020–0.030
N2	Vc	10–25	25–55	25–55	25–55
	f	0.001–0.010	0.010–0.018	0.018–0.025	0.025–0.035
N3	Vc	8–22	22–50	22–50	22–50
	f	0.001–0.008	0.008–0.016	0.016–0.023	0.023–0.033
N4	Vc	5–14	14–30	14–30	14–30
	f	0.001–0.005	0.005–0.010	0.010–0.016	0.016–0.020
N5	Vc	10–25	25–55	25–55	25–55
	f	0.001–0.010	0.010–0.018	0.018–0.025	0.025–0.035
N6	Vc	5–15	15–30	15–30	15–30
	f	0.001–0.005	0.005–0.010	0.010–0.016	0.016–0.020
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	6–10	10–20	10–20	10–20
	f	0.001–0.005	0.005–0.010	0.010–0.016	0.016–0.020
S2	Vc				
	f				
H1	Vc				
	f				
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc	15–30	15–30	15–30	15–30
	f	0.005–0.015	0.015–0.030	0.030–0.045	0.045–0.060
O2	Vc				
	f				
O3	Vc				
	f				

Art. 50740 / 50760 / 50780

Mat.		ø 0.20–0.50	ø 0.55–0.80	ø 0.85–1.20	ø 1.25–2.00
P1	Vc	6–10	10–25	10–25	10–25
	f	0.001–0.006	0.006–0.010	0.010–0.022	0.022–0.030
P2	Vc	5–8	8–20	8–20	8–20
	f	0.001–0.005	0.005–0.008	0.008–0.015	0.015–0.020
P3	Vc	4–7	7–18	7–18	7–18
	f	0.001–0.004	0.004–0.007	0.007–0.012	0.012–0.015
M1	Vc	4–5	5–15	5–15	5–15
	f	0.001–0.003	0.003–0.006	0.006–0.012	0.012–0.018
M2	Vc	2–4	4–12	4–12	4–12
	f	0.001–0.003	0.003–0.005	0.005–0.010	0.010–0.015
K1	Vc	6–10	10–25	10–25	10–25
	f	0.001–0.006	0.006–0.010	0.010–0.022	0.022–0.030
K2	Vc	5–8	8–20	8–20	8–20
	f	0.001–0.005	0.005–0.008	0.008–0.015	0.015–0.020
N1	Vc	4–6	6–18	6–18	6–18
	f	0.001–0.004	0.004–0.007	0.007–0.012	0.012–0.015
N2	Vc	6–10	10–25	10–25	10–25
	f	0.001–0.006	0.006–0.010	0.010–0.022	0.022–0.030
N3	Vc	5–8	8–20	8–20	8–20
	f	0.001–0.005	0.005–0.008	0.008–0.015	0.015–0.020
N4	Vc	3–5	5–15	5–15	5–15
	f	0.001–0.004	0.004–0.007	0.007–0.012	0.012–0.015
N5	Vc	6–10	10–25	10–25	10–25
	f	0.001–0.006	0.006–0.010	0.010–0.022	0.022–0.030
N6	Vc	4–6	6–18	6–18	6–18
	f	0.001–0.003	0.003–0.005	0.005–0.010	0.010–0.015
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	3–5	5–12	5–12	5–12
	f	0.001–0.003	0.003–0.005	0.005–0.010	0.010–0.015
S2	Vc				
	f				
H1	Vc				
	f				
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc	10–20	10–20	10–20	10–20
	f	0.005–0.010	0.010–0.015	0.015–0.020	0.020–0.025
O2	Vc				
	f				
O3	Vc				
	f				

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 51609

Mat.		ø 0.30–0.95	ø 1.00–1.95	ø 2.00–3.00
P1	Vc	50–70	70–100	70–100
	f	0.010–0.025	0.025–0.040	0.040–0.055
P2	Vc	40–60	60–80	60–80
	f	0.010–0.025	0.025–0.035	0.035–0.050
P3	Vc	30 – 50	50–70	50–70
	f	0.010 –0.020	0.015–0.025	0.025–0.040
M1	Vc	20–35	30–45	30–45
	f	0.005 – 0.008	0.015–0.025	0.025–0.035
M2	Vc	20–30	25–35	25–35
	f	0.005 – 0.008	0.010–0.020	0.020–0.030
K1	Vc	70–110	110–150	110–150
	f	0.020 – 0.050	0.030–0.040	0.040–0.050
K2	Vc	50–90	90–130	90–130
	f	0.015 – 0.040	0.025–0.035	0.035–0.050
N1	Vc	70–100	100–130	100–130
	f	0.020–0.030	0.030–0.040	0.040–0.050
N2	Vc	80–120	130–160	130–160
	f	0.020–0.030	0.030–0.050	0.050–0.060
N3	Vc	80–120	130–160	130–160
	f	0.020–0.030	0.030–0.050	0.050–0.060
N4	Vc	50–80	80–110	80–110
	f	0.015–0.025	0.025–0.035	0.035–0.045
N5	Vc	80–120	130–160	130–160
	f	0.015–0.025	0.025–0.035	0.035–0.045
N6	Vc			
	f			
N7	Vc			
	f			
N8	Vc			
	f			
S1	Vc	20–30	20–30	20–30
	f	0.005–0.010	0.010–0.020	0.020–0.030
S2	Vc	15–25	15–25	15–25
	f	0.005–0.010	0.010–0.020	0.020–0.030
H1	Vc	20–30	25–40	25–40
	f	0.005–0.015	0.015–0.025	0.025–0.035
H2	Vc	8–12	12–15	15–20
	f	0.003–0.008	0.008–0.015	0.015–0.020
H3	Vc			
	f			
O1	Vc	60–100	70–110	70–110
	f	0.010–0.020	0.020–0.030	0.030–0.040
O2	Vc			
	f			
O3	Vc			
	f			

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	Vc	70–110	70–110	70–110	70–110
	f	0.025–0.055	0.050–0.130	0.125–0.170	0.165–0.215
P2	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
P3	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
M1	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
M2	Vc	50–90	50–90	50–90	50–90
	f	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.150
K1	Vc	90–140	90–140	90–140	90–140
	f	0.050–0.110	0.100–0.270	0.260–0.340	0.320–0.420
K2	Vc	80–120	80–120	80–120	80–120
	f	0.040–0.100	0.090–0.250	0.240–0.300	0.280–0.360
N1	Vc	120–170	120–170	120–170	120–170
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N2	Vc	150–200	150–200	150–200	150–200
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N3	Vc	200–250	200–250	200–250	200–250
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N4	Vc	90–130	90–130	90–130	90–130
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N5	Vc	150–200	150–200	150–200	150–200
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N6	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	30–60	30–60	30–60	30–60
	f	0.015–0.035	0.030–0.085	0.080–0.110	0.100–0.135
S2	Vc	20–50	20–50	20–50	20–50
	f	0.020–0.050	0.045–0.120	0.115–0.150	0.140–0.190
H1	Vc	30–60	30–60	30–60	30–60
	f	0.020–0.030	0.030–0.100	0.090–0.140	0.120–0.170
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc	70–110	70–110	70–110	70–110
	vf	0.025–0.055	0.050–0.130	0.125–0.170	0.165–0.215
O2	Vc				
	f				
O3	Vc				
	f				

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 52912 / 52916

Mat.		1.00–2.40	2.50–5.00	5.10–8.00	8.10–10.00
P1	Vc	70–110	70–110	70–110	70–110
	f	0.030–0.080	0.060–0.130	0.125–0.170	0.170–0.240
P2	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.060	0.050–0.120	0.115–0.150	0.150–0.220
P3	Vc	50–90	50–90	50–90	50–90
	f	0.015–0.050	0.040–0.100	0.080–0.130	0.140–0.200
M1	Vc	50–90	50–90	50–90	50–90
	f	0.015–0.050	0.040–0.100	0.080–0.130	0.140–0.190
M2	Vc	40–80	40–80	40–80	40–80
	f	0.010–0.045	0.030–0.090	0.070–0.120	0.120–0.170
K1	Vc	90–140	90–140	90–140	90–140
	f	0.030–0.080	0.080–0.150	0.150–0.280	0.280–0.350
K2	Vc	80–120	80–120	80–120	80–120
	f	0.040–0.100	0.060–0.130	0.130–0.220	0.220–0.300
N1	Vc	150–200	150–200	150–200	150–200
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N2	Vc	150–200	150–200	150–200	150–200
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N3	Vc	150–200	150–200	150–200	150–200
	f	0.050–0.110	0.100–0.250	0.240–0.340	0.320–0.420
N4	Vc	120–170	120–170	120–170	120–170
	f	0.030–0.080	0.060–0.130	0.140–0.190	0.165–0.210
N5	Vc	120–170	120–170	120–170	120–170
	f	0.040–0.100	0.100–0.250	0.240–0.300	0.280–0.360
N6	Vc	80–120	80–120	80–120	80–120
	f	0.040–0.100	0.100–0.250	0.240–0.300	0.280–0.360
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	50–90	50–90	50–90	50–90
	f	0.020–0.060	0.040–0.100	0.100–0.200	0.100–0.135
S2	Vc	30–55	30–55	30–55	30–55
	f	0.010–0.040	0.030–0.070	0.080–0.130	0.100–0.170
H1	Vc	30–60	30–60	30–60	30–60
	f	0.015–0.050	0.040–0.100	0.090–0.140	0.120–0.150
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc	70–110	70–110	70–110	70–110
	f	0.025–0.050	0.050–0.130	0.130–0.170	0.170–0.220
O2	Vc				
	f				
O3	Vc				
	f				

Art. 52920 / 52930

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

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Schnittdaten
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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	Vc	50–80	60–100	60–100	60–100
	f	0.030–0.070	0.045–0.120	0.110–0.150	0.150–0.200
P2	Vc	45–70	55–90	55–90	55–90
	f	0.030–0.060	0.040–0.115	0.100–0.140	0.140–0.180
P3	Vc	40–60	55–90	55–90	55–90
	f	0.020–0.050	0.040–0.115	0.100–0.140	0.140–0.180
M1	Vc	20–45	50–90	50–90	50–90
	f	0.010–0.040	0.040–0.100	0.090–0.130	0.120–0.150
M2	Vc	20–40	40–80	40–80	40–80
	f	0.010–0.035	0.035–0.090	0.075–0.110	0.110–0.130
K1	Vc	60–80	80–120	80–120	80–120
	f	0.050–0.080	0.090–0.250	0.240–0.300	0.280–0.360
K2	Vc	50–70	70–100	70–100	70–100
	f	0.040–0.070	0.080–0.230	0.220–0.280	0.265–0.320
N1	Vc				
	f				
N2	Vc	80–110	140–190	140–190	140–190
	f	0.040–0.130	0.090–0.230	0.220–0.300	0.300–0.360
N3	Vc	90–130	180–220	180–220	180–220
	f	0.040–0.140	0.090–0.230	0.220–0.300	0.300–0.360
N4	Vc				
	f				
N5	Vc				
	f				
N6	Vc				
	f				
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	20–40	25–55	25–55	25–55
	f	0.010–0.030	0.025–0.050	0.040–0.070	0.060–0.100
S2	Vc				
	f				
H1	Vc	25–45	35–55	35–55	35–55
	f	0.010–0.020	0.015–0.040	0.030–0.060	0.050–0.090
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc				
	f				
O2	Vc				
	f				
O3	Vc				
	f				

Art. 50940

Mat.		ø 1.00–1.90	ø 2.00–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	Vc	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.045–0.120	0.110–0.150	0.150–0.200
P2	Vc	55–90	55–90	55–90	55–90
	f	0.015–0.045	0.040–0.115	0.100–0.140	0.140–0.180
P3	Vc	55–90	55–90	55–90	55–90
	f	0.015–0.045	0.040–0.115	0.100–0.140	0.140–0.180
M1	Vc	50–90	50–90	50–90	50–90
	f	0.015–0.045	0.040–0.100	0.090–0.130	0.120–0.150
M2	Vc	40–80	40–80	40–80	40–80
	f	0.010–0.040	0.035–0.090	0.075–0.110	0.110–0.130
K1	Vc	80–120	80–120	80–120	80–120
	f	0.040–0.100	0.090–0.250	0.240–0.300	0.280–0.360
K2	Vc	70–100	70–100	70–100	70–100
	f	0.030–0.090	0.080–0.230	0.220–0.280	0.265–0.320
N1	Vc				
	f				
N2	Vc	140–190	140–190	140–190	140–190
	f	0.040–0.100	0.090–0.230	0.220–0.300	0.300–0.360
N3	Vc	180–220	180–220	180–220	180–220
	f	0.040–0.100	0.090–0.230	0.220–0.300	0.300–0.360
N4	Vc				
	f				
N5	Vc				
	f				
N6	Vc				
	f				
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc	25–55	25–55	25–55	25–55
	f	0.010–0.030	0.025–0.050	0.040–0.070	0.060–0.100
S2	Vc				
	f				
H1	Vc	30–50	30–50	30–50	30–50
	f	0.005–0.015	0.010–0.040	0.030–0.050	0.050–0.065
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc				
	f				
O2	Vc				
	f				
O3	Vc				
	f				

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Schnittdaten
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Parametri di lavoro
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Art. 50941

Mat.		ø 0.50–0.90	ø 1.00–1.90	ø 2.00–3.00
P1	v_c	50–70	70–100	70–100
	f	0.020–0.040	0.035–0.060	0.060–0.120
P2	v_c	40–60	60–80	60–80
	f	0.010–0.030	0.025–0.045	0.045–0.100
P3	v_c	30–50	50–70	50–70
	f	0.010–0.020	0.015–0.040	0.040–0.080
M1	v_c	20–35	30–45	30–45
	f	0.005–0.008	0.008–0.020	0.020–0.030
M2	v_c	20–30	25–35	25–35
	f	0.005–0.008	0.008–0.015	0.015–0.025
K1	v_c	50–100	100–150	100–150
	f	0.020–0.050	0.040–0.080	0.080–0.120
K2	v_c	50–90	90–130	90–130
	f	0.015–0.040	0.030–0.060	0.060–0.100
N1	v_c			
	f			
N2	v_c	60–120	120–150	120–150
	f	0.020–0.040	0.040–0.080	0.080–0.120
N3	v_c	80–120	130–170	130–170
	f	0.020–0.040	0.040–0.080	0.080–0.120
N4	v_c			
	f			
N5	v_c			
	f			
N6	v_c			
	f			
N7	v_c			
	f			
N8	v_c			
	f			
S1	v_c	30–40	30–40	30–40
	f	0.005–0.008	0.008–0.020	0.020–0.035
S2	v_c			
	f			
H1	v_c	10–20	15–30	15–30
	f	0.003–0.006	0.005–0.015	0.015–0.020
H2	v_c			
	f			
H3	v_c			
	f			
O1	v_c			
	f			
O2	v_c			
	f			
O3	v_c			
	f			

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					
P2	v_c					
	f					
P3	v_c					
	f					
M1	v_c					
	f					
M2	v_c					
	f					
K1	v_c	60–110	60–110	60–110	60–110	60–110
	f	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	0.020–0.050	0.040–0.160	0.140–0.250	0.220–0.350	0.320–0.400
N1	v_c					
	f					
N2	v_c	200–250	200–250	200–250	200–250	200–250
	f	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	0.040–0.060	0.050–0.150	0.140–0.260	0.250–0.400	0.380–0.600
N4	v_c					
	f					
N5	v_c	80–120	80–120	80–120	80–120	80–120
	f	0.040–0.060	0.050–0.150	0.140–0.250	0.230–0.330	0.300–0.400
N6	v_c					
	f					
N7	v_c					
	f					
N8	v_c					
	f					
S1	v_c					
	f					
S2	v_c					
	f					
H1	v_c					
	f					
H2	v_c					
	f					
H3	v_c					
	f					
O1	v_c	20–40	20–40	20–40	20–40	20–40
	f	0.030–0.050	0.040–0.100	0.080–0.150	0.130–0.180	0.160–0.200
O2	v_c					
	f					
O3	v_c					
	f					

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Schnittdaten
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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	Vc	90–120	90–120	90–120	90–120	90–120
	f	0.080–0.200	0.180–0.350	0.300–0.400	0.350–0.450	0.400–0.600
P2	Vc	80–150	80–150	80–150	80–150	80–150
	f	0.050–0.180	0.160–0.250	0.220–0.350	0.330–0.400	0.380–0.550
P3	Vc					
	f					
M1	Vc					
	f					
M2	Vc					
	f					
K1	Vc	200–250	200–250	200–250	200–250	200–250
	f	0.100–0.250	0.220–0.350	0.330–0.450	0.420–0.550	0.520–0.700
K2	Vc	160–200	160–200	160–200	160–200	160–200
	f	0.080–0.180	0.160–0.250	0.230–0.350	0.330–0.500	0.450–0.550
N1	Vc					
	f					
N2	Vc					
	f					
N3	Vc	250–300	250–300	250–300	250–300	250–300
	f	0.050–0.150	0.130–0.250	0.230–0.350	0.330–0.450	0.430–0.550
N4	Vc					
	f					
N5	Vc	80–120	80–120	80–120	80–120	80–120
	f	0.050–0.120	0.100–0.220	0.200–0.320	0.300–0.400	0.380–0.450
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc					
	f					
S2	Vc					
	f					
H1	Vc	70–100	70–100	70–100	70–100	70–100
	f	0.050–0.100	0.080–0.180	0.160–0.260	0.240–0.300	0.280–0.350
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

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	Vc	80–120	80–120	80–120	80–120	80–120
	f	0.060–0.150	0.120–0.250	0.220–0.350	0.320–0.450	0.400–0.500
P2	Vc	60–80	60–80	60–80	60–80	60–80
	f	0.050–0.120	0.100–0.220	0.200–0.300	0.280–0.360	0.340–0.450
P3	Vc	50–70	50–70	50–70	50–70	50–70
	f	0.040–0.100	0.090–0.180	0.160–0.260	0.240–0.320	0.300–0.380
M1	Vc	40–60	40–60	40–60	40–60	40–60
	f	0.030–0.080	0.070–0.150	0.140–0.180	0.170–0.250	0.230–0.320
M2	Vc	30–50	30–50	30–50	30–50	30–50
	f	0.030–0.080	0.070–0.130	0.120–0.160	0.150–0.220	0.200–0.300
K1	Vc	100–130	100–130	100–130	100–130	100–130
	f	0.100–0.250	0.230–0.350	0.320–0.450	0.400–0.500	0.450–0.600
K2	Vc	60–80	60–80	60–80	60–80	60–80
	f	0.060–0.200	0.180–0.280	0.250–0.350	0.320–0.450	0.420–0.500
N1	Vc					
	f					
N2	Vc	150–200	150–200	150–200	150–200	150–200
	f	0.100–0.270	0.250–0.350	0.330–0.400	0.380–0.480	0.460–0.550
N3	Vc	130–160	130–160	130–160	130–160	130–160
	f	0.100–0.250	0.220–0.320	0.300–0.380	0.360–0.450	0.420–0.500
N4	Vc					
	f					
N5	Vc					
	f					
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc	30–60	30–60	30–60	30–60	30–60
	f	0.005–0.040	0.030–0.070	0.060–0.110	0.100–0.150	0.140–0.180
S2	Vc					
	f					
H1	Vc	60–90	60–90	60–90	60–90	60–90
	f	0.050–0.120	0.100–0.220	0.200–0.300	0.280–0.360	0.340–0.400
H2	Vc	40–60	40–60	40–60	40–60	40–60
	f	0.030–0.070	0.060–0.130	0.110–0.180	0.160–0.240	0.200–0.260
H3	Vc	15–35	15–35	15–35	15–35	15–35
	f	0.005–0.030	0.020–0.050	0.040–0.070	0.060–0.100	0.080–0.120
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

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

Art. 50838

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

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Schnittdaten
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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	Vc	30–60	50–90	50–90	50–90	50–90
	f	0.010–0.020	0.018–0.040	0.038–0.065	0.060–0.090	0.085–0.120
P2	Vc	20–35	30–60	30–60	30–60	30–60
	f	0.008–0.018	0.016–0.035	0.033–0.055	0.050–0.075	0.070–0.100
P3	Vc					
	f					
M1	Vc					
	f					
M2	Vc					
	f					
K1	Vc	20–40	30–70	30–70	30–70	30–70
	f	0.010–0.025	0.023–0.045	0.042–0.075	0.072–0.110	0.100–0.150
K2	Vc	15–30	25–50	25–50	25–50	25–50
	f	0.010–0.020	0.018–0.040	0.038–0.065	0.060–0.090	0.085–0.120
N1	Vc					
	f					
N2	Vc	80–120	110–160	110–160	110–160	110–160
	f	0.010–0.030	0.028–0.080	0.075–0.120	0.110–0.160	0.150–0.200
N3	Vc	60–100	50–120	50–120	50–120	50–120
	f	0.010–0.030	0.028–0.080	0.075–0.120	0.110–0.160	0.150–0.200
N4	Vc					
	f					
N5	Vc	40–70	60–120	60–120	60–120	60–120
	f	0.010–0.025	0.023–0.045	0.042–0.075	0.072–0.110	0.100–0.150
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc					
	f					
S2	Vc					
	f					
H1	Vc					
	f					
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

Art. 50840

Mat.		ø 2.00–5.00	ø 5.10–8.00	ø 8.10–11.00	ø 11.10–14.00
P1	Vc	30–60	30–60	30–60	30–60
	f	0.020–0.050	0.045–0.090	0.080–0.150	0.130–0.200
P2	Vc	25–50	25–50	25–50	25–50
	f	0.015–0.045	0.040–0.080	0.075–0.120	0.100–0.150
P3	Vc				
	f				
M1	Vc	20–45	20–45	20–45	20–45
	f	0.150–0.040	0.035–0.070	0.065–0.100	0.090–0.130
M2	Vc	15–35	15–35	15–35	15–35
	f	0.010–0.035	0.030–0.060	0.055–0.085	0.080–0.110
K1	Vc	30–60	30–60	30–60	30–60
	f	0.020–0.050	0.450–0.090	0.080–0.150	0.130–0.200
K2	Vc	25–50	25–50	25–50	25–50
	f	0.015–0.045	0.040–0.080	0.075–0.120	0.100–0.150
N1	Vc	30–60	30–60	30–60	30–60
	f	0.020–0.050	0.045–0.090	0.080–0.150	0.130–0.200
N2	Vc	60–100	60–100	60–100	60–100
	f	0.030–0.080	0.070–0.150	0.140–0.220	0.200–0.300
N3	Vc	50–90	50–90	50–90	50–90
	f	0.025–0.070	0.060–0.130	0.120–0.190	0.180–0.250
N4	Vc	50–90	50–90	50–90	50–90
	f	0.030–0.090	0.080–0.150	0.130–0.200	0.180–0.300
N5	Vc				
	f				
N6	Vc				
	f				
N7	Vc				
	f				
N8	Vc				
	f				
S1	Vc				
	f				
S2	Vc				
	f				
H1	Vc				
	f				
H2	Vc				
	f				
H3	Vc				
	f				
O1	Vc				
	f				
O2	Vc				
	f				
O3	Vc				
	f				

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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	Vc	40–60	40–60	40–60	40–60	40–60
	f	0.015–0.040	0.035–0.080	0.075–0.170	0.160–0.230	0.200–0.300
P2	Vc	30–50	30–50	30–50	30–50	30–50
	f	0.010–0.035	0.030–0.075	0.070–0.155	0.150–0.210	0.190–0.250
P3	Vc					
	f					
M1	Vc	25–40	25–40	25–40	25–40	25–40
	f	0.010–0.030	0.025–0.070	0.060–0.100	0.090–0.140	0.120–0.200
M2	Vc					
	f					
K1	Vc	60–100	60–100	60–100	60–100	60–100
	f	0.020–0.050	0.040–0.090	0.080–0.180	0.160–0.280	0.250–0.350
K2	Vc	40–80	40–80	40–80	40–80	40–80
	f	0.015–0.040	0.035–0.080	0.700–0.170	0.150–0.230	0.210–0.300
N1	Vc					
	f					
N2	Vc	80–120	80–120	80–120	80–120	80–120
	f	0.020–0.060	0.050–0.120	0.100–0.230	0.210–0.340	0.330–0.450
N3	Vc	60–100	60–100	60–100	60–100	60–100
	f	0.020–0.060	0.050–0.120	0.100–0.230	0.210–0.340	0.330–0.450
N4	Vc					
	f					
N5	Vc					
	f					
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc	30–50	30–50	30–50	30–50	30–50
	f	0.010–0.030	0.025–0.070	0.060–0.130	0.100–0.160	0.150–0.200
S2	Vc					
	f					
H1	Vc					
	f					
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc	30–50	30–50	30–50	30–50	30–50
	f	0.013–0.035	0.035–0.045	0.045–0.060	0.060–0.080	0.080–0.100
O2	Vc					
	f					
O3	Vc					
	f					

Art. 55652

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

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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	Vc	20–30	20–30	20–30	20–30	20–30
	f	0.050–0.100	0.080–0.130	0.120–0.180	0.170–0.230	0.220–0.280
P2	Vc	15–25	15–25	15–25	15–25	15–25
	f	0.040–0.080	0.070–0.120	0.110–0.170	0.160–0.220	0.210–0.260
P3	Vc	10–20	10–20	10–20	10–20	10–20
	f	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
M1	Vc	10–20	10–20	10–20	10–20	10–20
	f	0.040–0.080	0.070–0.120	0.110–0.170	0.160–0.220	0.200–0.260
M2	Vc	10–15	10–15	10–15	10–15	10–15
	f	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
K1	Vc	20–30	20–30	20–30	20–30	20–30
	f	0.050–0.100	0.080–0.150	0.140–0.220	0.200–0.260	0.030–0.280
K2	Vc	15–25	15–25	15–25	15–25	15–25
	f	0.050–0.090	0.750–0.140	0.130–0.200	0.180–0.240	0.200–0.260
N1	Vc					
	f					
N2	Vc	30–40	30–40	30–40	30–40	30–40
	f	0.060–0.120	0.110–0.160	0.150–0.220	0.200–0.260	0.240–0.300
N3	Vc	25–35	25–35	25–35	25–35	25–35
	f	0.060–0.120	0.110–0.160	0.150–0.220	0.200–0.260	0.240–0.300
N4	Vc	15–25	15–25	15–25	15–25	15–25
	f	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
N5	Vc	30–40	30–40	30–40	30–40	30–40
	f	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
N6	Vc					
	f					
N7	Vc					
	f					
N8	Vc					
	f					
S1	Vc	10–15	10–15	10–15	10–15	10–15
	f	0.035–0.070	0.060–0.100	0.090–0.150	0.130–0.180	0.170–0.200
S2	Vc					
	f					
H1	Vc					
	f					
H2	Vc					
	f					
H3	Vc					
	f					
O1	Vc					
	f					
O2	Vc					
	f					
O3	Vc					
	f					

Art. 70030 – 70090 / 70130 – 70190

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

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Art. 72075 / 72150

Mat.		ø 0.10–0.30	ø 0.40–1.50	ø 1.50–3.0	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	0.5×d1	1×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	0.3×d1	1×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.001–0.004	0.003–0.200	0.015–0.035	0.2×d1	1×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.001–0.004	0.003–0.020	0.015–0.035	0.4×d1	1×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.001–0.004	0.003–0.016	0.014–0.028	0.25×d1	1×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	0.4×d1	1×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	0.9×d1	1×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.001–0.005	0.004–0.020	0.018–0.040	0.9×d1	1×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	0.5×d1	1×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	0.4×d1	1×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. 42000

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.50	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.30 x d1	1 x d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.15 x d1	1 x d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	0.10 x d1	1 x d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.10 x d1	1 x d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	0.10 x d1	1 x d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.40 x d1	1 x d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.20 x d1	1 x d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	0.40 x d1	1 x d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.25 x d1	1 x d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.25 x d1	1 x 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	0.40 x d1	1 x d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.20 x d1	1 x 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	0.20 x d1	1 x 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	0.20 x d1	1 x d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 72500/ 72800

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.50	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.30 × d1	1 × d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.15 × d1	1 × d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	0.10 × d1	1 × d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.10 × d1	1 × d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	0.10 × d1	1 × d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.40 × d1	1 × d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.20 × d1	1 × d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	0.40 × d1	1 × d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.25 × d1	1 × d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.25 × d1	1 × 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	0.40 × 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	0.20 × d1	1 × 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	0.20 × d1	1 × 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	0.20 × d1	1 × d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

Art. 73130

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.90	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.80 x d1	1 x d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.60 x d1	1 x d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	0.50 x d1	1 x d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.50 x d1	1 x d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	0.40 x d1	1 x d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.80 x d1	1 x d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.80 x d1	1 x d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	1.00 x d1	1 x d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1.00 x d1	1 x d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1.30 x d1	1 x 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	1.00 x d1	1 x d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.80 x d1	1 x 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	0.80 x d1	1 x 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					

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.
These are recommended values that depend on the condition of the machine, fixture, coolant etc., and they may have to be adapted yet.

Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 73200 / 73300

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.90	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.9×d1	1×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.8×d1	1×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.004–0.010	0.006–0.020	0.0015–0.035	0.7×d1	1×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.6×d1	1×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.004–0.008	0.005–0.016	0.014–0.028	0.5×d1	1×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	1.0×d1	1×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.004–0.010	0.006–0.020	0.015–0.035	0.9×d1	1×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.004–0.01	0.006–0.020	0.015–0035	0.9×d1	1×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.9×d1	1×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.005–0.010	0.008–0.020	0.018–0.040	0.9×d1	1×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	0.8×d1	1×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	0.7×d1	1×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. 73800

Mat.		ø 0.50–1.00	ø 1.00–2.00	ø 2.00–2.50	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.30 × d1	1 × d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.15 × d1	1 × d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.10 × d1	1 × d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.20 × d1	1 × d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.002–0.006	0.006–0.012	0.012–0.022	0.10 × d1	1 × d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.40 × d1	1 × d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.20 × d1	1 × d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.40 × d1	1 × d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.25 × d1	1 × d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.25 × d1	1 × d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.40 × d1	1 × d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.20 × d1	1 × d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.002–0.006	0.006–0.012	0.012–0.020	0.20 × d1	1 × 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					

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. 73725

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.90	a_p	a_e
P1	V_c	60–80	60–80	60–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.45 × d1	1 × d1
P2	V_c	50–70	50–70	50–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.25 × d1	1 × d1
P3	V_c	40–60	40–60	40–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.15 × d1	1 × d1
M1	V_c	30–50	30–50	30–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.35 × d1	1 × d1
M2	V_c	25–40	25–40	25–40		
	f_z	0.002–0.006	0.006–0.012	0.012–0.022	0.2 × d1	1 × d1
K1	V_c	40–70	40–70	40–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.8 × d1	1 × d1
K2	V_c	30–60	30–60	30–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.35 × d1	1 × d1
N1	V_c	70–100	70–100	70–100		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.8 × d1	1 × d1
N2	V_c	80–120	80–120	80–120		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.7 × d1	1 × d1
N3	V_c	60–100	60–100	60–100		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.7 × d1	1 × d1
N4	V_c					
	f_z					
N5	V_c	40–80	40–80	40–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.8 × d1	1 × d1
N6	V_c	25–50	25–50	25–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.45 × d1	1 × d1
N7	V_c					
	f_z					
N8	V_c					
	f_z					
S1	V_c	25–50	25–50	25–50		
	f_z	0.002–0.006	0.006–0.012	0.012–0.020	0.3 × d1	1 × 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_p	a_e
P1	V_c	80–120	80–120	80–120		
	f_z	0.002–0.005	0.003–0.015	0.005–0.030	0.8×d1	1×d1
P2	V_c	70–100	70–100	70–100		
	f_z	0.001–0.004	0.003–0.012	0.005–0.025	0.6×d1	1×d1
P3	V_c	40–70	40–70	40–70		
	f_z	0.001–0.003	0.002–0.012	0.003–0.018	0.5×d1	1×d1
M1	V_c	60–90	60–90	60–90		
	f_z	0.001–0.003	0.002–0.012	0.003–0.016	0.5×d1	1×d1
M2	V_c	30–60	30–60	30–60		
	f_z	0.001–0.003	0.002–0.010	0.003–0.013	0.4×d1	1×d1
K1	V_c	150–200	150–200	150–200		
	f_z	0.002–0.005	0.003–0.014	0.005–0.028	0.8×d1	1×d1
K2	V_c	60–100	60–100	60–100		
	f_z	0.001–0.006	0.003–0.012	0.005–0.023	0.8×d1	1×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	1×d1
N4	V_c	60–100	60–100	60–100		
	f_z	0.001–0.009	0.003–0.018	0.004–0.036	0.8×d1	1×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	0.8×d1	1×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	0.8×d1	1×d1
S2	V_c	20–40	20–40	20–40		
	f_z	0.001–0.002	0.001–0.004	0.002–0.008	0.2×d1	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	0.2×d1	1×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	1×d1
O2	V_c					
	f_z					
O3	V_c					
	f_z					

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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. 43305

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

Art. 74720

Mat.		ø 0.30–0.70	ø 0.70–1.50	ø 1.50–2.90	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.45 x d1	1 x d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.25 x d1	1 x d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.20 x d1	1 x d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.15 x d1	1 x d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.002–0.006	0.006–0.012	0.012–0.022	0.20 x d1	1 x d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.70 x d1	1 x d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.35 x d1	1 x d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.80 x d1	1 x d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.70 x d1	1 x d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.70 x d1	1 x d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.80 x d1	1 x d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.45 x d1	1 x d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.002–0.006	0.006–0.012	0.012–0.020	0.30 x d1	1 x 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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Art. 74740

Mat.		ø 0.40–0.70	ø 0.70–1.50	ø 1.50–2.90	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.40 x d1	1 x d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.20 x d1	1 x d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.12 x d1	1 x d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.30 x d1	1 x d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.002–0.006	0.006–0.012	0.012–0.022	0.15 x d1	1 x d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.65 x d1	1 x d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.30 x d1	1 x d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.65 x d1	1 x d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.5 x d1	1 x d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.5 x d1	1 x d1
N4	v_c					
	f_z					
N5	v_c	40–80	40–80	40–80		
	f_z	0.003–0.008	0.008–0.016	0.016–0.030	0.65 x d1	1 x d1
N6	v_c	25–50	25–50	25–50		
	f_z	0.002–0.007	0.007–0.014	0.014–0.026	0.40 x d1	1 x d1
N7	v_c					
	f_z					
N8	v_c					
	f_z					
S1	v_c	25–50	25–50	25–50		
	f_z	0.002–0.006	0.006–0.012	0.012–0.020	0.3 x d1	1 x 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. 74075 / 74150 / 74300

Mat.		ø 0.20–0.70	ø 0.70–1.50	ø 1.50–2.80	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	0.45×d1	1×d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	0.25×d1	1×d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.003–0.010	0.006–0.020	0.0015–0.035	0.15×d1	1×d1
M1	v_c	30–50	30–50	30–50		
	f_z	0.003–0.010	0.006–0.020	0.015–0.035	0.35×d1	1×d1
M2	v_c	25–40	25–40	25–40		
	f_z	0.003–0.008	0.005–0.016	0.014–0.028	0.2×d1	1×d1
K1	v_c	40–70	40–70	40–70		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	0.8×d1	1×d1
K2	v_c	30–60	30–60	30–60		
	f_z	0.003–0.010	0.006–0.020	0.015–0.035	0.35×d1	1×d1
N1	v_c	70–100	70–100	70–100		
	f_z	0.003–0.01	0.006–0.020	0.015–0035	0.8×d1	1×d1
N2	v_c	80–120	80–120	80–120		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	0.7×d1	1×d1
N3	v_c	60–100	60–100	60–100		
	f_z	0.004–0.010	0.008–0.020	0.018–0.040	0.7×d1	1×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	0.8×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	0.45×d1	1×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	0.3×d1	1×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	0.9×d1	1×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 40000

Mat.		ø 2.00–5.00	ø 6.00–12.00	a_p	a_e
P1	v_c	60–90	60–90		
	f_z	0.015–0.060	0.050–0.100	0.5×d1	1×d1
P2	v_c	50–80	50–80		
	f_z	0.015–0.060	0.050–0.100	0.3×d1	1×d1
P3	v_c				
	f_z				
M1	v_c				
	f_z				
M2	v_c				
	f_z				
K1	v_c	40–60	40–60		
	f_z	0.020–0.070	0.050–0.110	1×d1	1×d1
K2	v_c	30–50	30–50		
	f_z	0.015–0.060	0.050–0.100	0.4×d1	1×d1
N1	v_c	100–150	100–150		
	f_z	0.015–0.060	0.040–0.120	1×d1	1×d1
N2	v_c	200–250	200–250		
	f_z	0.020–0.070	0.050–0.120	1×d1	1×d1
N3	v_c	180–220	180–220		
	f_z	0.020–0.070	0.050–0.120	1×d1	1×d1
N4	v_c	50–100	50–100		
	f_z	0.015–0.050	0.030–0.080	0.5×d1	1×d1
N5	v_c	100–150	100–150		
	f_z	0.020–0.070	0.050–0.120	1×d1	1×d1
N6	v_c	30–60	30–60		
	f_z	0.015–0.050	0.040–0.100	0.7×d1	1×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				

Art. 40002

Mat.		ø 2.00–5.00	ø 6.00–12.00	a_p	a_e
P1	v_c	60–80	60–80		
	f_z	0.015–0.060	0.030–0.110	1×d1	1×d1
P2	v_c	50–70	50–70		
	f_z	0.015–0.060	0.030–0.110	0.6×d1	1×d1
P3	v_c	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.5×d1	1×d1
M1	v_c	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.5×d1	1×d1
M2	v_c				
	f_z				
K1	v_c	60–80	60–80		
	f_z	0.015–0.060	0.030–0.110	1×d1	1×d1
K2	v_c	50–70	60–80		
	f_z	0.015–0.060	0.030–0.100	0.6×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				
	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. 40004

Mat.		ø 2.00–5.00	ø 6.00–12.00	a_p	a_e
P1	v_c	60–80	60–80		
	f_z	0.020–0.060	0.030–0.110	0.5×d1	1×d1
P2	v_c	50–70	50–70		
	f_z	0.015–0.060	0.030–0.110	0.5×d1	1×d1
P3	v_c	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.4×d1	1×d1
M1	v_c	40–60	40–60		
	f_z	0.010–0.050	0.020–0.100	0.4×d1	1×d1
M2	v_c				
	f_z				
K1	v_c	60–80	60–80		
	f_z	0.020–0.060	0.030–0.110	0.80×d1	1×d1
K2	v_c	50–70	50–70		
	f_z	0.150–0.050	0.030–0.100	0.70×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				
	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. 47000 / 47500

Mat.		ø 2.00–5.00	ø 6.00–12.00	ø 13.00–20.00	a_p	a_e
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	0.5×d1	1×d1
N2	v_c	300–1000	300–1000	300–1000		
	f_z	0.030–0.060	0.060–0.140	0.140–0.250	0.5×d1	1×d1
N3	v_c	300–1000	300–1000	300–1000		
	f_z	0.030–0.060	0.060–0.140	0.140–0.250	0.5×d1	1×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	0.5×d1	1×d1
O2	v_c					
	f_z					
O3	v_c					
	f_z					

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Art. 76300

Mat.		ø 1.50–2.50	ø 2.50–4.00	ø 4.00–6.00	a_p	a_e
P1	v_c	60–80	60–80	60–80		
	f_z	0.010–0.020	0.020–0.040	0.040–0.060	1 × d1	1 × d1
P2	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.020–0.040	0.040–0.060	0.6 × d1	1 × d1
P3	v_c	40–60	40–60	40–60		
	f_z	0.008–0.015	0.015–0.035	0.035–0.050	0.5 × d1	1 × d1
M1	v_c	40–60	40–60	40–60		
	f_z	0.008–0.015	0.015–0.035	0.035–0.050	0.5 × d1	1 × d1
M2	v_c					
	f_z					
K1	v_c	60–80	60–80	60–80		
	f_z	0.010–0.020	0.020–0.040	0.040–0.060	1 × d1	1 × d1
K2	v_c	50–70	50–70	50–70		
	f_z	0.010–0.020	0.020–0.040	0.040–0.060	0.6 × 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					
	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. 73000

Mat.		ø 0.50–1.50	ø 2.00–3.00	ø 6.00–8.00
P1	v_c	70–120	70–120	70–120
	f_z	0.004–0.015	0.015–0.030	0.050–0.120
P2	v_c	60–100	60–100	60–100
	f_z	0.003–0.013	0.013–0.025	0.045–0.100
P3	v_c	40–80	40–80	40–80
	f_z	0.002–0.012	0.012–0.023	0.040–0.090
M1	v_c	40–80	40–80	40–80
	f_z	0.002–0.012	0.008–0.020	0.030–0.080
M2	v_c	30–70	30–70	30–70
	f_z	0.001–0.010	0.010–0.016	0.025–0.070
K1	v_c	120–150	100–150	100–150
	f_z	0.004–0.015	0.015–0.030	0.050–0.120
K2	v_c	100–130	100–130	100–130
	f_z	0.003–0.013	0.013–0.025	0.045–0.100
N1	v_c	150–200	150–200	150–200
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
N2	v_c	150–200	150–200	150–200
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
N3	v_c	150–200	150–200	150–200
	f_z	0.004–0.015	0.015–0.030	0.050–0.120
N4	v_c	150–200	150–200	150–200
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
N5	v_c	150–200	150–200	150–200
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
N6	v_c			
	f_z			
N7	v_c	80–120	80–120	80–120
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
N8	v_c	80–120	80–120	80–120
	f_z	0.005–0.018	0.018–0.035	0.060–0.150
S1	v_c	40–70	40–70	40–70
	f_z	0.002–0.012	0.012–0.023	0.040–0.090
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. 43400

Mat.		ø 1.00–2.00	ø 3.00–4.00	ø 5.00–6.00
P1	v_c	80–120	80–120	80–120
	f_z	0.020–0.030	0.030–0.040	0.040–0.050
P2	v_c	80–100	80–100	80–100
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
P3	v_c	50–80	50–80	50–80
	f_z	0.005–0.015	0.015–0.025	0.025–0.035
M1	v_c	60–100	60–100	60–100
	f_z	0.010–0.015	0.015–0.025	0.025–0.035
M2	v_c	40–70	40–70	40–70
	f_z	0.015–0.025	0.025–0.035	0.035–0.045
K1	v_c	100–150	100–150	100–150
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
K2	v_c	60–100	60–100	60–100
	f_z	0.005–0.015	0.015–0.025	0.025–0.035
N1	v_c	150–200	150–200	150–200
	f_z	0.020–0.030	0.030–0.040	0.040–0.050
N2	v_c	150–200	150–200	150–200
	f_z	0.020–0.030	0.030–0.050	0.050–0.060
N3	v_c	130–200	130–200	130–200
	f_z	0.020–0.030	0.030–0.050	0.050–0.060
N4	v_c	60–150	60–150	60–150
	f_z	0.015–0.025	0.025–0.035	0.035–0.045
N5	v_c	100–200	100–200	100–200
	f_z	0.015–0.025	0.025–0.035	0.035–0.045
N6	v_c	80–150	80–150	80–150
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
N7	v_c	80–150	80–150	80–150
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
N8	v_c	80–150	80–150	80–150
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
S1	v_c	40–70	40–70	40–70
	f_z	0.010–0.025	0.020–0.035	0.030–0.045
S2	v_c	20–40	20–40	20–40
	f_z	0.005–0.015	0.015–0.025	0.020–0.035
H1	v_c	20–45	25–40	25–40
	f_z	0.005–0.015	0.015–0.025	0.025–0.035
H2	v_c	20–30	15–25	15–25
	f_z	0.005–0.010	0.010–0.015	0.015–0.020
H3	v_c			
	f_z			
O1	v_c	100–150	70–110	70–110
	f_z	0.010–0.020	0.020–0.030	0.030–0.040
O2	v_c			
	f_z			
O3	v_c			
	f_z			

Art. 71330

Mat.		ø 0.20–1.00	ø 1.00–2.00	ø 2.00–3.00	a_p	a_e
P1	v_c	40–60	40–60	40–60		
	f_z	0.002–0.013	0.013–0.020	0.020–0.030	1×d	0.2×d
P2	v_c	30–50	30–50	30–50		
	f_z	0.002–0.012	0.012–0.018	0.018–0.025	1×d	0.2×d
P3	v_c					
	f_z					
M1	v_c	25–40	25–40	24–40		
	f_z	0.002–0.011	0.011–0.016	0.016–0.022	1×d	0.1×d
M2	v_c	20–35	20–35	20–35		
	f_z	0.002–0.010	0.010–0.015	0.015–0.020	1×d	0.1×d
K1	v_c	40–60	40–60	40–60		
	f_z	0.002–0.013	0.013–0.020	0.020–0.030	1×d	0.2×d
K2	v_c	35–55	35–55	35–55		
	f_z	0.002–0.012	0.012–0.018	0.018–0.025	1×d	0.2×d
N1	v_c					
	f_z					
N2	v_c	150–200	150–200	150–200		
	f_z	0.003–0.015	0.015–0.030	0.030–0.050	1×d	0.2×d
N3	v_c	150–200	150–200	150–200		
	f_z	0.002–0.013	0.013–0.020	0.020–0.030	1×d	0.1×d
N4	v_c					
	f_z					
N5	v_c	100–130	100–130	100–130		
	f_z	0.003–0.015	0.015–0.030	0.030–0.050	1×d	0.2×d
N6	v_c					
	f_z					
N7	v_c	120–150	120–150	120–150		
	f_z	0.003–0.015	0.015–0.030	0.030–0.050	1×d	0.2×d
N8	v_c	120–150	120–150	120–150		
	f_z	0.002–0.013	0.013–0.020	0.020–0.030	1×d	0.1×d
S1	v_c	30–50	30–50	30–50		
	f_z	0.002–0.012	0.012–0.018	0.018–0.025	1×d	0.2×d
S2	v_c					
	f_z					
H1	v_c					
	f_z					
H2	v_c					
	f_z					
H3	v_c					
	f_z					
O1	v_c	150–200	150–200	150–200		
	f_z	0.003–0.015	0.015–0.030	0.030–0.050	1×d	0.2×d
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.
These are recommended values that depend on the condition of the machine, fixture, coolant etc., and they may have to be adapted yet.

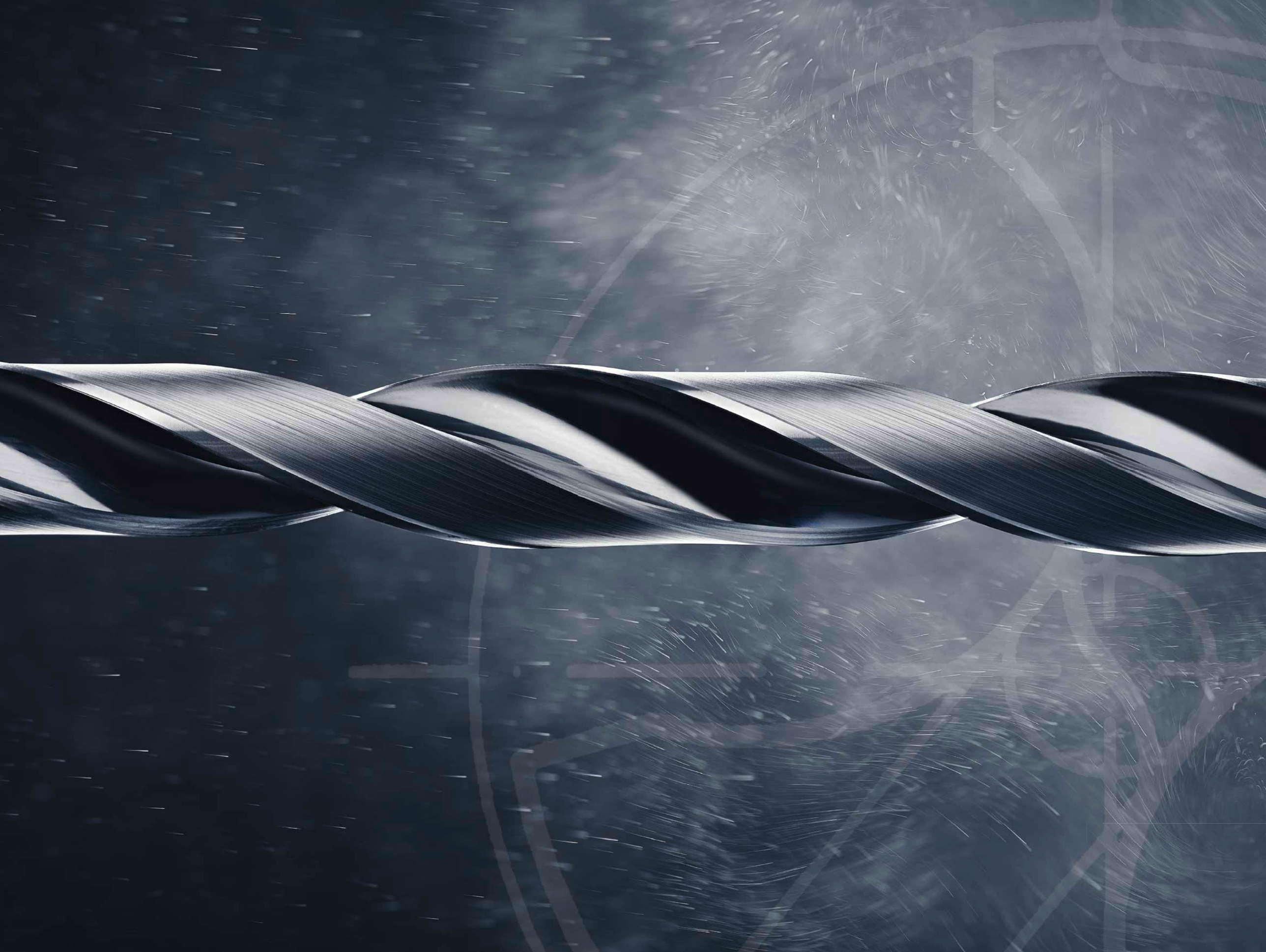
Anwendungen
Application
Applicazioni
Applications

	Sackloch Trou borgne	Foro cieco Blind hole
	Sackloch mit Senkung Trou borgne avec chanfrein	Foro cieco con smusso Blind hole with countersink
	Stufenbohrung Trou étagé	Foro a gradino Step hole
	Durchgangsbohrung Trou traversant	Foro passante Through hole
	Durchgang mit Senkung Trou traversant avec chanfrein	Foro con smusso Through hole with countersink
	Mehrere Schichten Perçage multiple	Multistrato Multi-composite material
	Querbohrung Perçage latéral	Foro trasversale Cross hole
	In Rundung Surface arrondie	Superfice a raggio Round surface
	In Schräge Surface inclinée	Superfice inclinata Inclined surface
	Gravierstichel flach Graveur avec plat	Bulino piatto Graver for groove, flat bottom
	Gravierstichel rund Graveur avec rayon	Bulino a raggio Graver for groove, full bottom radius
	Radius einstechen Rayon en plongée	Raggio a tuffo Plunge radius
	Radius längs Fraise de rayon longitudinal	Raggio longitudinale Straight radius
	Senkung 60° Centrage / Chanfrein 60°	Angolo 60° Countersink 60°
	Senkung 90° Centrage / Chanfrein 90°	Angolo 90° Countersink 90°
	Senkung 120° Centrage / Chanfrein 120°	Angolo 120° Countersink 120°

	Senkung 130° Centrage / Chanfrein 130°	Angolo 130° Countersink 130°
	Senkung 140° Centrage / Chanfrein 140°	Angolo 140° Countersink 140°
	Senkung 90° – 140° Double angle 90° – 140°	Angolo 90° – 140° Double angle countersink 90° – 140°
	Kantenbruch 60° Chanfrein 60°	Smusso 60° Chamfer 60°
	Kantenbruch 90° Chanfrein 90°	Smusso 90° Chamfer 90°
	Kantenbruch 120° Chanfrein 120°	Smusso 120° Chamfer 120°
	Innen- und Aussenkantenbruch / Chanfrein intérieur et extérieur	Smusso interno ed esterno / Internal and external chamfer
	Einstechen Plongée	Entrata a tuffo Plunge
	Nuten normal Transversal	Fresatura normale Straight groove milling
	Nuten schräg Fraisage angulaire	Fresatura inclinata Angular groove milling
	Schlichten Stirnseite Fraisage de finition latéral et frontal	Finitura frontale Front side finishing
	Schlichten mit Umfang Fraisage de finition latéral	Finitura laterale Side finishing
	Schruppen Stirnseite Fraisage ébauche	Sgrossatura frontale Front side roughing
	Zyklisch eckig Fraisage de poche	Fresatura angolare Angular milling
	Zyklisch rund Fraisage circulaire	Fresatura circolare Circular milling

Werkstoffgruppen
Groupe des matériaux
Gruppi di materiali
Workpiece materials

	Festigkeit (N / mm²), Härte Force (N / mm²), dureté	Resistenza (N / mm²), durezza Strength (N / mm²), hardness	Beispiel Esempio Exemple Example		Material Matière	Materiale Material
P1	bis / jusqu'à 700 N / mm²	sino / up to 700 N / mm²	1.0037, 1.0050, 1.0060, 1.0718	P1	Unlegierte Stähle, Stahlguss Aciers non-alliés	Acciai non legati Unalloyed steels, steel casting
P2	bis / jusqu'à 1000 N / mm²	sino / up to 1000 N / mm²	1.1191, 1.2067, 1.3505, 1.4021, 1.4104, 1.7131, 1.7225, 1.8509	P2	Legierte Stähle Aciers alliés	Acciai legati Alloyed steels
P3	bis / jusqu'à 1400 N / mm²	sino / up to 1400 N / mm²	1.2344, 1.2721, 1.3243, 1.6582, 1.8519	P3	Hochlegierte Stähle Aciers ht.-alliés	Acciai alto legati High alloyed / high-grade steels
M1			1.4003, 1.4006, 1.4016, 1.4034, 1.4312, 1.4548	M1	Nichtrostender Stahl ferritische / martensitische Aciers inox martensitiques	Acciaio inossidabile ferritico / martensitico Ferritic / martensitic stainless steels
M2			1.4301, 1.4306, 1.4401, 1.4404, 1.4435, 1.4571	M2	Nichtrostender Stahl austenitisch Aciers inox austénitiques	Acciaio inossidabile austenitico Austenitic stainless steels
K1			0.6010, 0.6015, 0.6020, 0.6025, 0.6030, 0.6035, 0.6040	K1	Grauguss Fonte grise	Ghisa grigia Grey cast iron
K2			0.8035, 0.8040, 0.8135, 0.8155, 0.8165, 0.8170	K2	Gusseisen mit Kugelgraphit ferritisch, perrlitisch Fonte sphéroïdale	Ghisa sferoidale ferritica, perlitica Spheroidal / ductile cast iron
N1	bis / jusqu'à 350 N / mm²	sino / up to 350 N / mm²	3.0255, 3.3315, 3.4345	N1	Alu-Knetlegierungen Aluminium malléable	Alluminio estruso Malleable alu alloy
N2	bis / jusqu'à 300 N / mm²	sino / up to 300 N / mm²	3.1371, 3.2371, 3.2373, 3.2581	N2	Alu-Gusslegierung <10% Si Aluminium <10% Si	Leghe d'alluminio per getto <10% Si Cast alu alloy <10% Si
N3	bis / jusqu'à 450 N / mm²	sino / up to 450 N / mm²	3.2582, 3.2583	N3	Alu-Gusslegierung >10% Si Aluminium >10% Si	Leghe d'alluminio per getto >10% Si Cast alu alloy >10% Si
N4			3.5101, 3.5103, 3.5106, 3.5161, 3.5200, 3.5312, 3.5470, 3.5612, 3.5632, 3.5812	N4	Magnesiumlegierungen Alliages au magnésium	Leghe di magnesio Magnesium, magnesium alloys
N5			2.0240, 2.0265, 2.0321, 2.0592, 2.0596, 2.0966, 2.0975, 2.1050, 2.1052, 2.1293	N5	Kupfer und Kupferlegierungen kurzspanend Alliages CuNi-Laiton	Rame e leghe di rame, trucioli corti Copper nickel alloys, brass
N6			2.1090, 2.1096, 2.1176, 2.1182, 2.1188	N6	Kupfer und Kupferlegierungen langspanend Alliages CuBe-Cuivre	Rame e leghe di rame, trucioli lunghi Copper, forging copper alloys
N7				N7	Silber Argent	Argento Silver
N8				N8	Gold Or	Oro Gold
S1	über / au-dessus 450 N / mm²	oltre / over 450 N / mm²	3.7025, 3.7124, 3.7164, 3.7165	S1	Titan, Titanlegierungen Titane	Titanio, leghe di titanio Titanium, titanium alloys
S2			2.4360, 2.4375, 2.4630, 2.4642, 2.4668, 2.4669, 2.4856, 2.4858	S2	Warmfeste Legierungen Ni- oder Co-Basis Super alliage NiCo	Super leghe a base Ni / Co Ni / Co based super alloys
H1				H1	Gehärtete Stähle, 50 – 55 HRC Ac. trempé 50 – 55 HRC	Acciai temperati, 50 – 55 HRC Hardened steels 50 – 55 HRC
H2				H2	Gehärtete Stähle, 55 – 60 HRC Ac. trempé 55 – 60 HRC	Acciai temperati, 55 – 60 HRC Hardened steels 55 – 60 HRC
H3				H3	Gehärtete Stähle, > 60 HRC Ac. trempé > 60 HRC	Acciai temperati, > 60 HRC Hardened steels > 60 HRC
O1			PMMA, Plexiglass, Acrylic glass, Polymethylmetacrylate, Polycarbonate	O1	Thermoplaste, Duroplaste ohne abrasive Füllstoffe Plastiques	Termoplastici e termoindurenti Thermoplast, thermosetting plastics
O2			EP, Epoxid, Epoxy, Bakelite, Pertinax	O2	Kunststoffe faserverstärkt Fibres synthétiques	Plastiche rinforzate con fibre Fiber-reinforced plastics
O3				O3	Graphit Graphite	Grafite Graphite



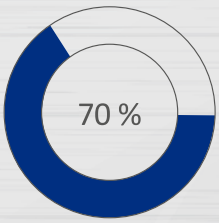
Beschichtungsempfehlung
Proposition de revêtement
Raccomandazione del rivestimento
Recommendation for coating

Alle unbeschichteten Werkzeuge bieten wir auch mit Beschichtung an.
Kontaktieren Sie uns, wir empfehlen Ihnen gerne die optimale Beschichtung für Ihre Anwendung.

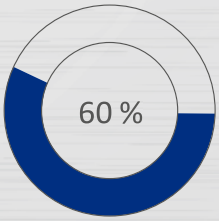
Tous les outils non revêtus sont également disponibles avec revêtement.
Contactez-nous, nous vous recommanderons volontiers le revêtement optimal pour votre application.

Tutti gli articoli non rivestiti gli offriamo anche con rivestimento.
Contattateci, noi vi raccomandiamo con piacere il rivestimento adatto per la vostra applicazione.

All the non-coated tools can also be offered with coating.
Please contact us to recommend the optimum coat for your application.

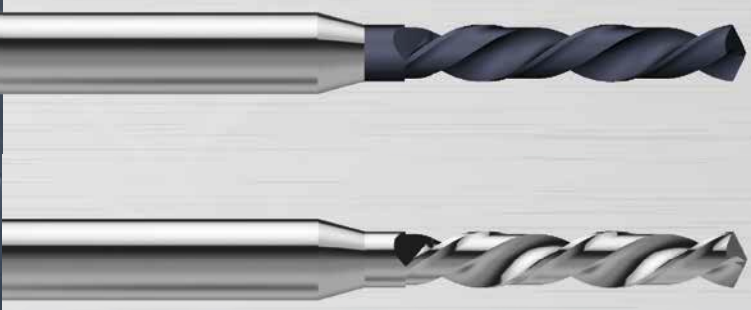


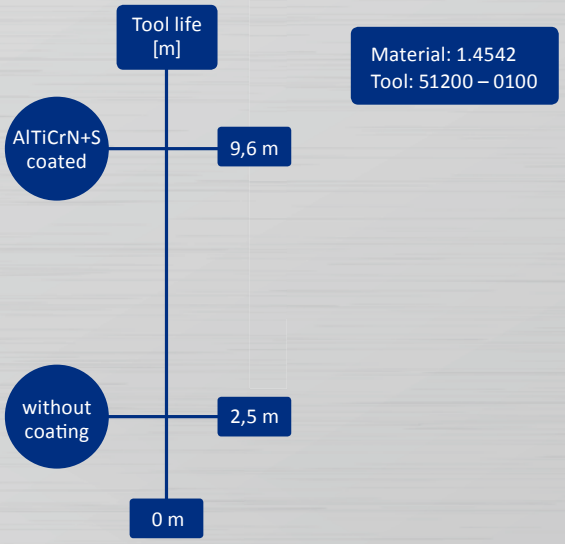
... macht die Wahl der Beschichtung im Bezug auf Ihre Anwendung aus!
... faites le choix du revêtement en fonction de votre application!
... fa la scelta del rivestimento in relazione alla vostra applicazione!
... representing the choice of the coat in relation to your application!



... Kosteneinsparung aufgrund längerer Werkzeugstandzeit!
... réduction des coûts grâce à une amélioration de la durée de vie des outils!
... di risparmio a causa della durata di vita del'utensile!
... cost saving as a result of a longer tool-life!

Bis zu 100 % mehr Performance!
Jusqu'à 100 % de performance en plus!
Fino al 100 % di performance!
Up to 100 % higher performance!

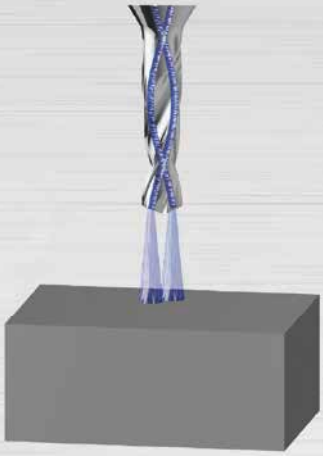




Bearbeitungsverfahren allgemein
Procédé d'usinage général
Procedura d'usinaggio in generale
General machining process

Kühlung
Refroidissement
Lubrificazione
Cooling

Innenkühlung
Refroidissement intérieur
Lubrificazione interna
Internal coolant



Aussenkühlung
Refroidissement extérieur
Lubrificazione esterna
External coolant

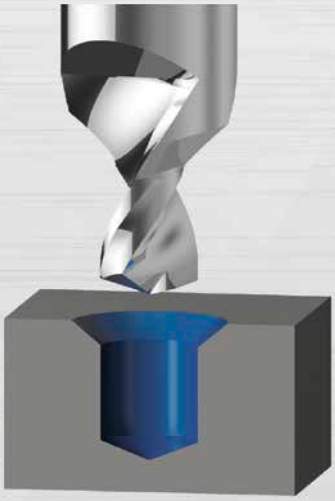
Durchmesser Diamètre Diametro Diameter	Druck / Pression / Pressione / Pressure			
	bar		psi	
	< 6xd	> 6xd	< 6xd	> 6xd
1.00 – 3.00	30	60	435	870
3.00 – 6.00	20	30	290	435
6.00 – 10.00	10	20	145	290

Bearbeitungsverfahren allgemein
Procédé d’usinage général
Procedura d’usinaggio in generale
General machining process

Anbohrerstrategie Eintritt und Bohreraustritt
Stratégie de perçage entrée et sortie du foret
Strategia di foratura con entrata ed uscita della punta
Spot drilling strategy drill entering and exit

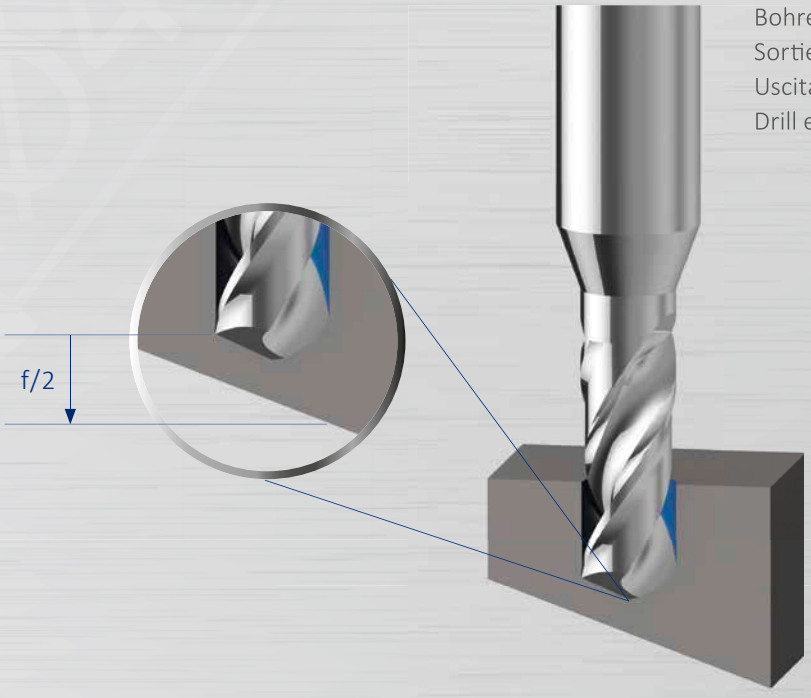
Zentrieren
Centrer
Centrare
Centering

Pilotloch
Trou pilote
Preforo
Pilothole



Fräsen einer Fläche
Fraiser une surface
Fresatura di una superficie
Milling a flat

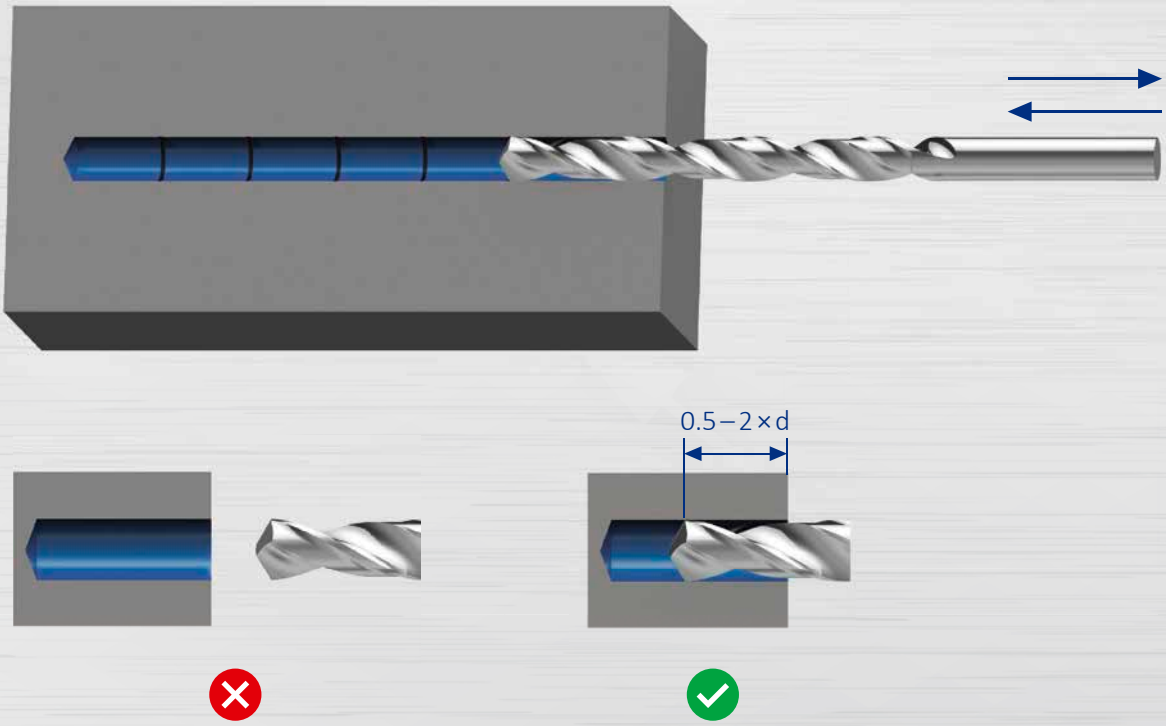
Bohreraustritt in schräger Fläche
Sortie du foret d’une surface inclinée
Uscita della punta in superfice inclinata
Drill exit in an inclined surface



Bearbeitungsverfahren allgemein
Procédé d’usinage général
Procedura d’usinaggio in generale
General machining process

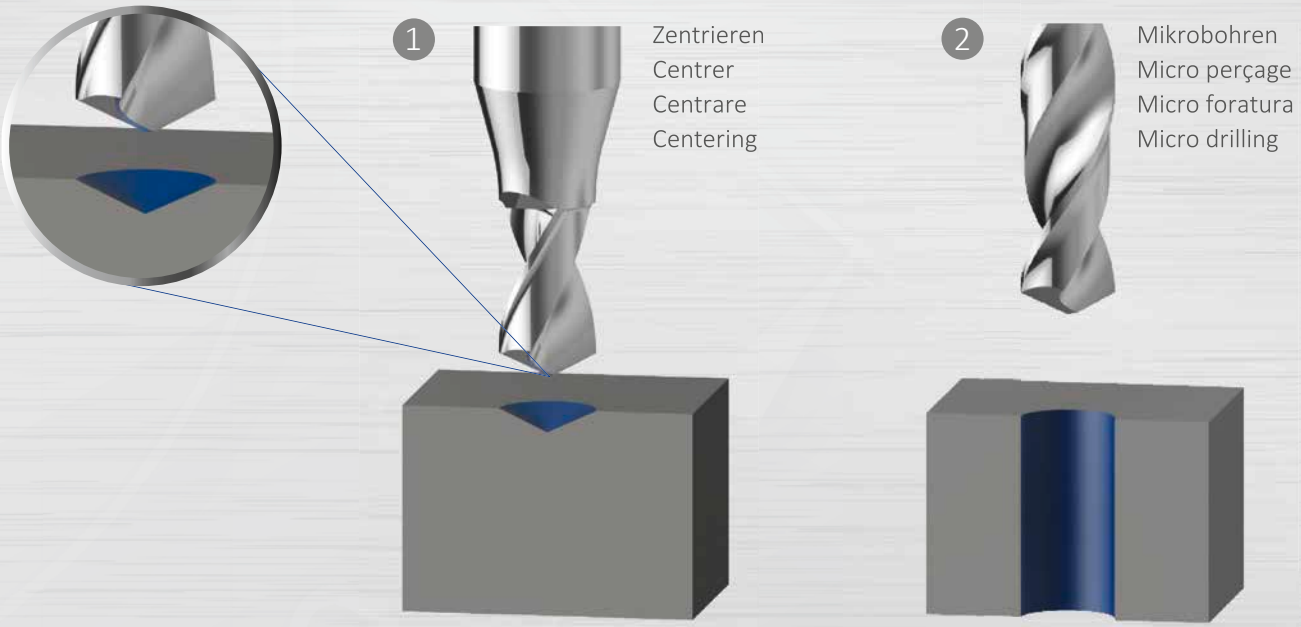
Folgewerkzeug
Outil progressif
Utensile seguente
Subsequent tool

Entspänenzyklus
Cycle de débourrage
Ciclo evacuazione trucioli
Pecking cycle

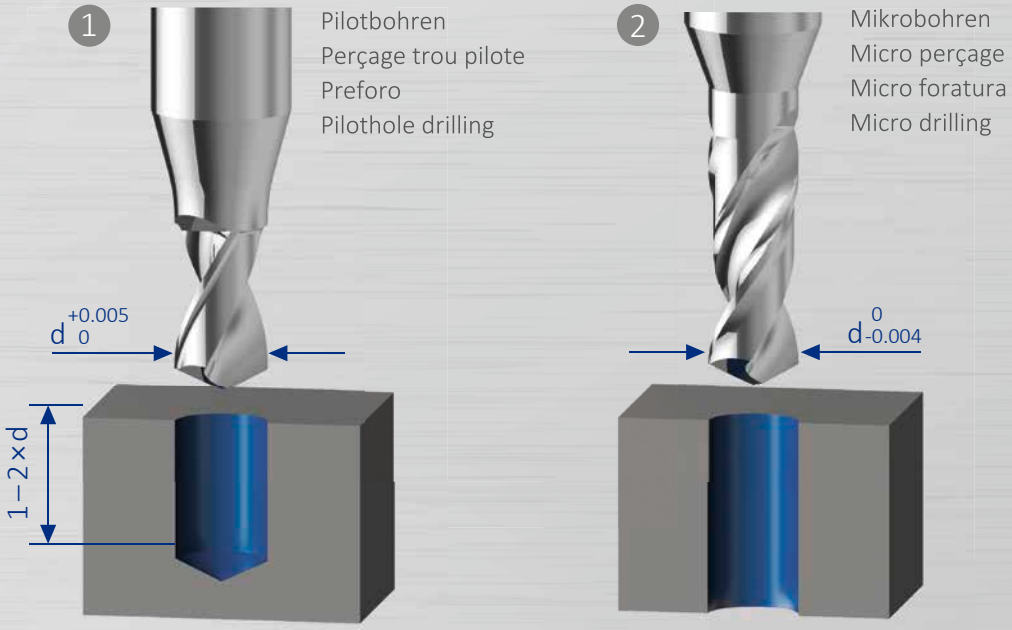


Bearbeitungsverfahren Mikrobohren
Procédé d’usinage pour micro perçage
Procedura d’usinaggio per micro foratura
Machining process for micro drilling

Zentrieren ≤ 6 × d
Centrer ≤ 6 × d
Centrare ≤ 6 × d
Centering ≤ 6 × d



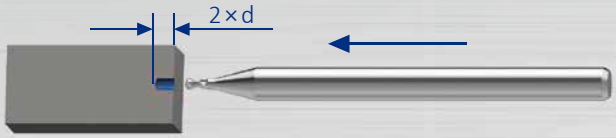
Pilotbohren ≥ 6 × d
Perçage trou pilote ≥ 6 × d
Preforo ≥ 6 × d
Pilothole drilling ≥ 6 × d



Bearbeitungsverfahren Mikrobohren
Procédé d'usinage pour micro perçage
Procedura d'usinaggio per micro foratura
Machining process for micro drilling

Mikro-Tieflochbohren Art. 50720
Micro perçage profond Art. 50720
Micro foratura profonda Art. 50720
Micro deep hole drilling Art. 50720

1



Art. 56033 ø +0.01

2

n = max. 500 min^{-1} | vf = 25 % – 50 %

3

vc = 100 % | vf = 100 %

0.5 – 2 × d

vc = 100 % | vf = 200 % – 500 %

vc = 100 % | vf = 100 %

4

vc = 100 % | vf = 200 % – 500 %

5

n = max. 500 min^{-1} | vf = max.

Bearbeitungsverfahren Mikrobohren
Procédé d’usinage pour micro perçage
Procedura d’usinaggio per micro foratura
Machining process for micro drilling

Mikro-Tieflochbohren Art. 50740 / 50760 / 50780
Micro perçage profond Art. 50740 / 50760 / 50780
Micro foratura profonda Art. 50740 / 50760 / 50780
Micro deep hole drilling Art. 50740 / 50760 / 50780

1

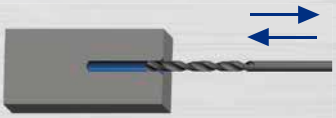
Art. 56036

2

n = max. 500 min^{-1} | vf = 25 % – 50 %

3

vc = 100 % | vf = 100 %



0.5 – 2 × d

vc = 100 % | vf = 200 % – 500 %

vc = 100 % | vf = 100%

4

vc = 100 % | vf = 200 % – 500 %

5

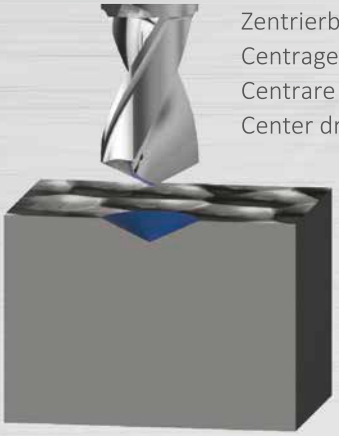
n = max. 500 min^{-1} | vf = max.

Bearbeitungsverfahren Hochleistungsbohren
Procédé d’usinage à grand rendement
Procedura d’usinaggio per foratura ad alto rendimento
Machining process for high performance drilling

Zentrierung ≤ 9 × d
Centrer ≤ 9 × d
Centrare ≤ 9 × d
Centering ≤ 9 × d

Ohne Zentrierung
Sans centrage
Senza centrino
Without centering

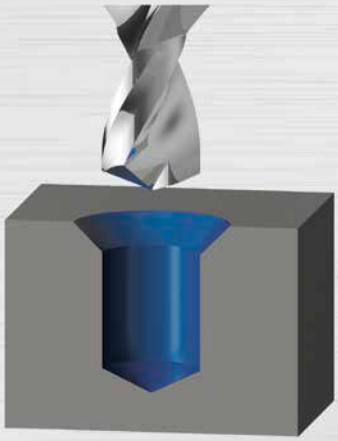
Saubere Eintrittsfläche
Surface plate
Superfice liscia
Smooth entering surface



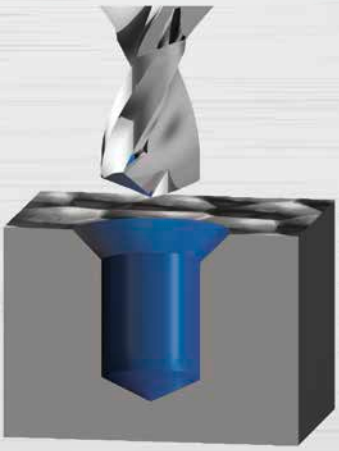
Zentrierbohren
Centrage
Centrare
Center drilling

Raue oder unebene Eintrittsfläche
Surface rugueuse ou inégale
Superfice grezza
Rough or uneven entering surface

Pilotbohrung > 9 × d
Perçage trou pilote > 9 × d
Preforo > 9 × d
Pilothole drilling > 9 × d



Saubere Eintrittsfläche
Surface plate
Superfice liscia
Smooth entering surface

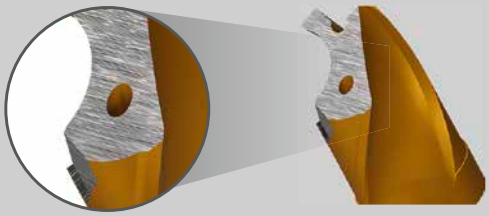
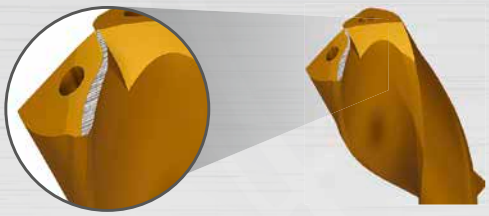
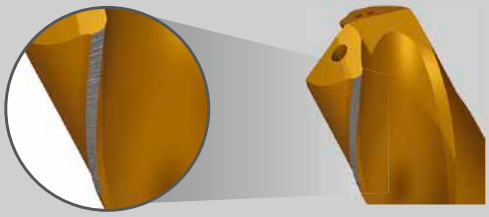
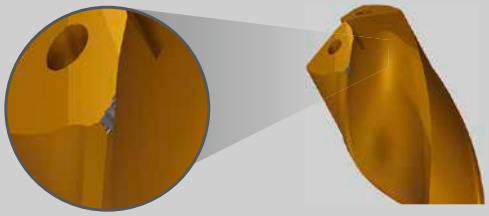


Raue oder unebene Eintrittsfläche
Surface rugueuse ou inégale
Superfice grezza
Rough or uneven entering surface

Bearbeitungsverfahren Hochleistungsbohren
Procédé d'usinage à grand rendement
Procedura d'usinaggio per foratura ad alto rendimento
Machining process for high performance drilling

Bohrstrategie > 9 × d
Stratégie de perçage > 9 × d
Strategia di foratura > 9 × d
Drilling strategy > 9 × d

Störungsbehebung bei Werkzeugverschleiss
Correction pour éviter l'usure des outils
Eliminazione danni per causa di usura
Troubleshooting in case of tool wear

Verschleissart Type d'usure Genere di usura Type of wear		Schnittbedingungen / Conditions de coupe /	
		Schnittgeschwindigkeit Vitesse de coupe Velocità di taglio Cutting speed	Vorschub Avance Avanzamento Feed rate
Bohrerbruch Rupture du foret Rottura della punta Drill breakage		⚠	↓
Freiflächenverschleiss Usure de l'arrête de coupe Spoglia usurata Flank wear		↓	↑
Führungsfasenverschleiss Usure du filet Filo di guida usurato Wear on margin		↓	●
Ausbrüche Querschneide Usure de l'âme Spigolo scheggiato Chipping on chisel edge		⚠	↑
Eckenausbrüche Coin ébréché Angolo scheggiato Chipping on corner		⚠	↓
Verschleiss Hauptschneide Arrête de coupe ébréchée Usura tagliente principale Wear on main cutting edge		↑	↑

↑ erhöhen / augmenter
aumentare / increase

⚠ überprüfen / vérifier
controllare / verify

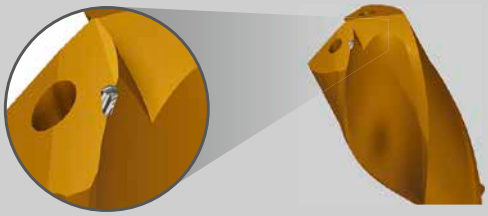
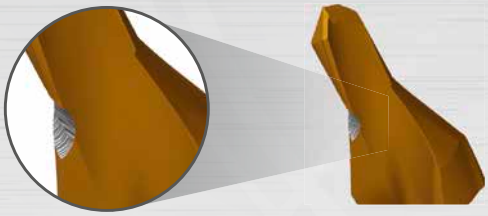
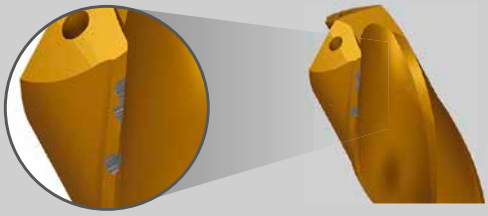
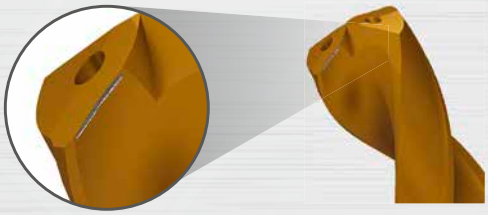
↓ verringern / réduire
ridurre / reduce

● nicht relevant / pas pertinent
non rilevante / not relevant

Condizioni di taglio / Cutting conditions

Vorschub beim Eintritt Avance à l'entrée Avanzamento a l'entrata Entry feed rate	Vorschub beim Austritt Avance à la sortie Avanzamento a l'uscita Exit feed rate	Vorbearbeitung (Zentrieren, Pilotbohren) Préparation (Centrage, Préperçage) Prelavorazione (Centrare, Preforare) Pre-machining (Centering, Pilot hole drilling)	Entspänen Débourrage Evacuazione trucioli Pecking cycle
↓	↓	⚠	⚠
↑	⚠	●	●
●	●	⚠	⚠
↑	↓	⚠	●
↓	↓	⚠	⚠
⚠	⚠	⚠	●

Störungsbehebung bei Werkzeugverschleiss
Correction pour éviter l'usure des outils
Eliminazione danni per causa di usura
Troubleshooting in case of tool wear

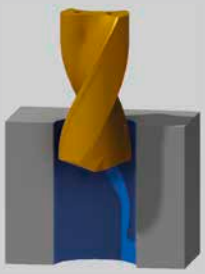
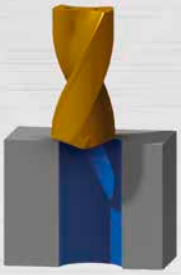
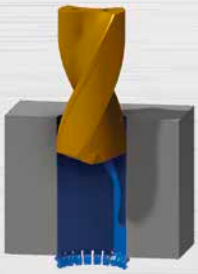
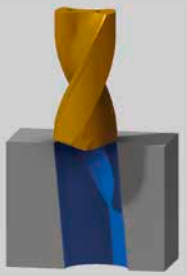
Verschleissart Type d'usure Genere di usura Type of wear		Schnittbedingungen / Conditions de coupe /	
		Schnittgeschwindigkeit Vitesse de coupe Velocità di taglio Cutting speed	Vorschub Avance Avanzamento Feed rate
Ausbruch Hauptschneide Cassure arrête de coupe Tagliente principale scheggiato Chipping main cutting edge		⚠	⬇
Ausbruch Stufe Cassure à l'étage Gradino scheggiato Chipping on step transition		⚠	⬇
Ausbrüche Führungsfase Ebréchure sur la filet Filo di guida scheggiato Chipping on margin		●	⚠
Aufbauschneide Usure sous l'arrête de coupe Sovrastruttura di materiale sul tagliente Built-up edge		⬆	⚠

⬆ erhöhen / augmenter aumentare / increase	⚠ überprüfen / vérifier controllare / verify
⬇ verringern / réduire ridurre / reduce	● nicht relevant / pas pertinent non rilevante / not relevant

Condizioni di taglio / Cutting conditions

Vorschub beim Eintritt Avance à l'entrée Avanzamento a l'entrata Entry feed rate	Vorschub beim Austritt Avance à la sortie Avanzamento a l'uscita Exit feed rate	Vorbearbeitung (Zentrieren, Pilotbohren) Préparation (Centrage, Préperçage) Prelavorazione (Centrare, Preforare) Pre-machining (Centering, Pilot hole drilling)	Entspänen Débourrage Evacuazione trucioli Pecking cycle
⬇	⬇	⚠	⚠
⬇	⬇	⚠	⚠
⚠	⚠	⚠	⚠
●	⚠	●	●

Störungsbehebung bei Abweichung am Werkstück
Correction en cas de déviation de la pièce usinée
Eliminazione danni in causa di deviazione del pezzo da lavorare
Troubleshooting in case of deviation at the workpiece

Verschleissart Type d'usure Genere di usura Type of wear		Schnittbedingungen / Conditions de coupe /	
		Schnittgeschwindigkeit Vitesse de coupe Velocità di taglio Cutting speed	Vorschub Avance Avanzamento Feed rate
Durchmesser zu gross Diamètre trop grand Diametro troppo grande Diameter too large		↓	↑
Versatz aus der Mitte Décentrage du trou Fuori centro Misalignment from the center		●	↓
Schlechte Oberflächenqualität Mauvaise qualité de surface Scarsa qualità superfice Poor surface quality		↑	↓
Gratbildung Bohrungsaustritt Bavure à la sortie du trou Bave all'uscita del foro Burr formation at bore exit		⚠	●
Verlauf der Bohrung Déviation du trou Foro deviato Bore runout		⚠	↑

↑ erhöhen / augmenter
aumentare / increase

⚠ überprüfen / vérifier
controllare / verify

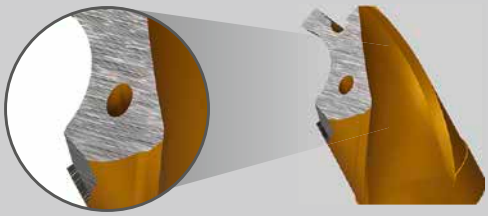
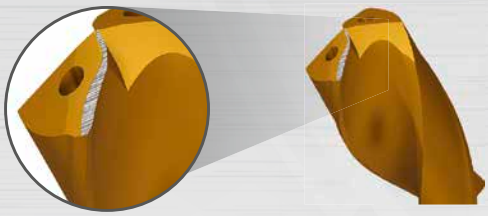
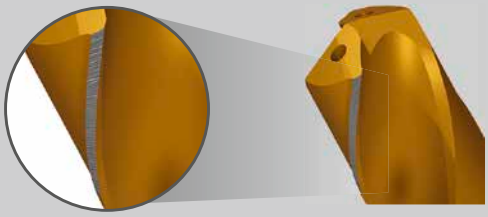
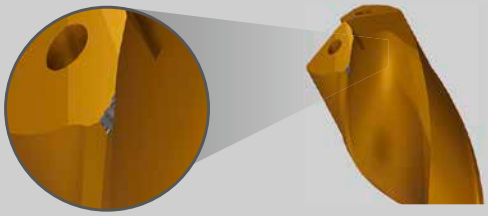
↓ verringern / réduire
ridurre / reduce

● nicht relevant / pas pertinent
non rilevante / not relevant

Condizioni di taglio / Cutting conditions

	Vorschub beim Eintritt Avance à l'entrée Avanzamento a l'entrata Entry feed rate	Vorschub beim Austritt Avance à la sortie Avanzamento a l'uscita Exit feed rate	Vorbearbeitung (Zentrieren, Pilotbohren) Préparation (Centrage, Préperçage) Prelavorazione (Centrare, Preforare) Pre-machining (Centering, Pilot hole drilling)	Entspänen Débourrage Evacuazione trucioli Pecking cycle
	↑	⚠	⚠	⚠
	↓	⚠	⚠	●
	●	●	⚠	⚠
	●	↓	●	●
	⚠	●	⚠	⚠

Störungsbehebung bei Werkzeugverschleiss
Correction pour éviter l'usure des outils
Eliminazione danni per causa di usura
Troubleshooting in case of tool wear

Verschleissart Type d'usure Genere di usura Type of wear		Kühlschmierstoff / Lubrifiant Lubrificante / Coolant	
		Kühlschmierstoffkonzentration Concentration du lubrifiant Concentrato lubrificante Concentration of coolant	Kühlschmierstoffmenge Quantité de lubrifiant Quantità lubrificante Rate of coolant
Bohrerbruch Rupture du foret Rottura della punta Drill breakage		•	↑
Freiflächenverschleiss Usure de l'arrête de coupe Spoglia usurata Flank wear		↑	↑
Führungsfasenverschleiss Usure du filet Filo di guida usurato Wear on margin		↑	↑
Ausbrüche Querschneide Usure de l'âme Spigolo scheggiato Chipping on chisel edge		•	↑
Eckenausbrüche Coin ébréché Angolo scheggiato Chipping on corner		•	↑
Verschleiss Hauptschneide Arrête de coupe ébréchée Usura tagliente principale Wear on main cutting edge		↑	↑

↑ erhöhen / augmenter
aumentare / increase

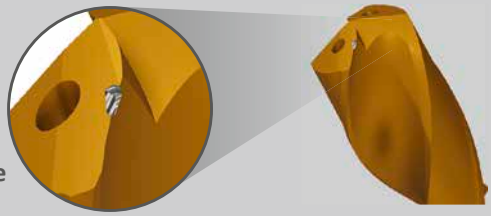
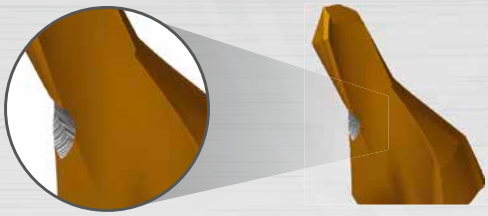
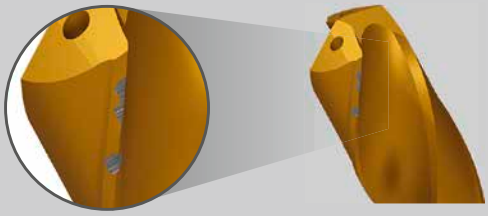
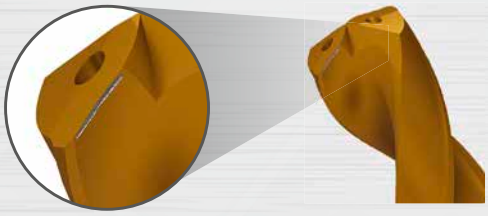
⚠ überprüfen / vérifier
controllare / verify

↓ verringern / réduire
ridurre / reduce

● nicht relevant / pas pertinent
non rilevante / not relevant

	Maschine und Einbau des Werkzeuges / Machine et installation des outils Macchina e montaggio del utensile / Machine and fitting of the tool			
Kühlschmierstoffdruck Pression du lubrifiant Pressione lubrificante Coolant pressure	Rundlaufgenauigkeit Concentricité Precisione concentricità Concentricity	Kürzere Auskraglänge Longueur minimal acceptable Estremità codolo Shorter projecting length	Werkstückspannung Serrage de l'outil Fissaggio del pezzo Workpiece clamping	Maschinenstabilität Stabilité de la machine Stabilità macchina Stability of the machine
↑	⚠	⚠	⚠	⚠
↑	⚠	⚠	⚠	⚠
↑	⚠	●	⚠	⚠
↑	⚠	⚠	⚠	⚠
↑	⚠	⚠	⚠	⚠
↑	⚠	⚠	⚠	⚠

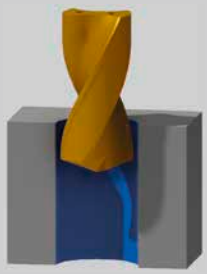
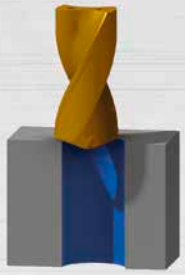
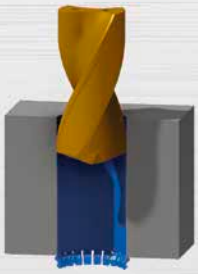
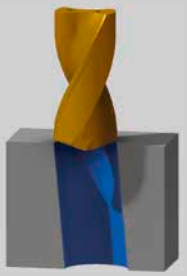
Störungsbehebung bei Werkzeugverschleiss
Correction pour éviter l'usure des outils
Eliminazione danni per causa di usura
Troubleshooting in case of tool wear

Verschleissart Type d'usure Genere di usura Type of wear	Kühlschmierstoff / Lubrifiant Lubrificante / Coolant	
	Kühlschmierstoffkonzentration Concentration du lubrifiant Concentrato lubrificante Concentration of coolant	Kühlschmierstoffmenge Quantité de lubrifiant Quantità lubrificante Rate of coolant
Ausbruch Hauptschneide Cassure arrête de coupe Tagliente principale scheggiato Chipping main cutting edge 	●	●
Ausbruch Stufe Cassure à l'étage Gradino scheggiato Chipping on step transition 	●	●
Ausbrüche Führungsfase Ebréchure sur la filet Filo di guida scheggiato Chipping on margin 	●	●
Aufbauschneide Usure sous l'arrête de coupe Sovrastruttura di materiale sul tagliente Built-up edge 	↑	↑

⬆	erhöhen / augmenter aumentare / increase
⚠	überprüfen / vérifier controllare / verify
⬇	verringern / réduire ridurre / reduce
●	nicht relevant / pas pertinent non rilevante / not relevant

	Maschine und Einbau des Werkzeuges / Machine et installation des outils Macchina e montaggio del utensile / Machine and fitting of the tool			
Kühlschmierstoffdruck Pression du lubrifiant Pressione lubrificante Coolant pressure	**Rundlaufgenauigkeit Concentricité Precisione concentricità Concentricity**	**Kürzere Auskraglänge Longueur minimal acceptable Estremità codolo Shorter projecting length**	**Werkstückspannung Serrage de l'outil Fissaggio del pezzo Workpiece clamping**	**Maschinenstabilität Stabilité de la machine Stabilità macchina Stability of the machine**
●	⚠	⚠	⚠	⚠
●	⚠	⚠	⚠	⚠
●	●	●	⚠	⚠
⬆	⚠	●	●	●

Störungsbehebung bei Abweichung am Werkstück
Correction en cas de déviation de la pièce usinée
Eliminazione danni in causa di deviazione del pezzo da lavorare
Troubleshooting in case of deviation at the workpiece

Verschleissart Type d'usure Genere di usura Type of wear		Kühlschmierstoff / Lubrifiant Lubrificante / Coolant	
		Kühlschmierstoffkonzentration Concentration du lubrifiant Concentrato lubrificante Concentration of coolant	Kühlschmierstoffmenge Quantité de lubrifiant Quantità lubrificante Rate of coolant
Durchmesser zu gross Diamètre trop grand Diametro troppo grande Diameter too large		↓	⚠
Versatz aus der Mitte Décentrage du trou Fuori centro Misalignment from the center		●	●
Schlechte Oberflächenqualität Mauvaise qualité de surface Scarsa qualità superfice Poor surface quality		↑	↑
Gratbildung Bohrungsaustritt Bavure à la sortie du trou Bave all'uscita del foro Burr formation at bore exit		●	●
Verlauf der Bohrung Déviation du trou Foro deviato Bore runout		●	⚠

⬆	erhöhen / augmenter aumentare / increase
⬇	verringern / réduire ridurre / reduce
⚠	überprüfen / vérifier controllare / verify
●	nicht relevant / pas pertinent non rilevante / not relevant

	Maschine und Einbau des Werkzeuges / Machine et installation des outils Macchina e montaggio del utensile / Machine and fitting of the tool			
Kühlschmierstoffdruck Pression du lubrifiant Pressione lubrificante Coolant pressure	Rundlaufgenauigkeit Concentricité Precisione concentricità Concentricity	Kürzere Auskraglänge Longueur minimal acceptable Estremità codolo Shorter projecting length	Werkstückspannung Serrage de l'outil Fissaggio del pezzo Workpiece clamping	Maschinenstabilität Stabilité de la machine Stabilità macchina Stability of the machine
⚠	⚠	⚠	⚠	⚠
●	⚠	⚠	⚠	●
⬆	⚠	⚠	⚠	⚠
●	●	●	⚠	●
⚠	●	⚠	⚠	⚠

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.