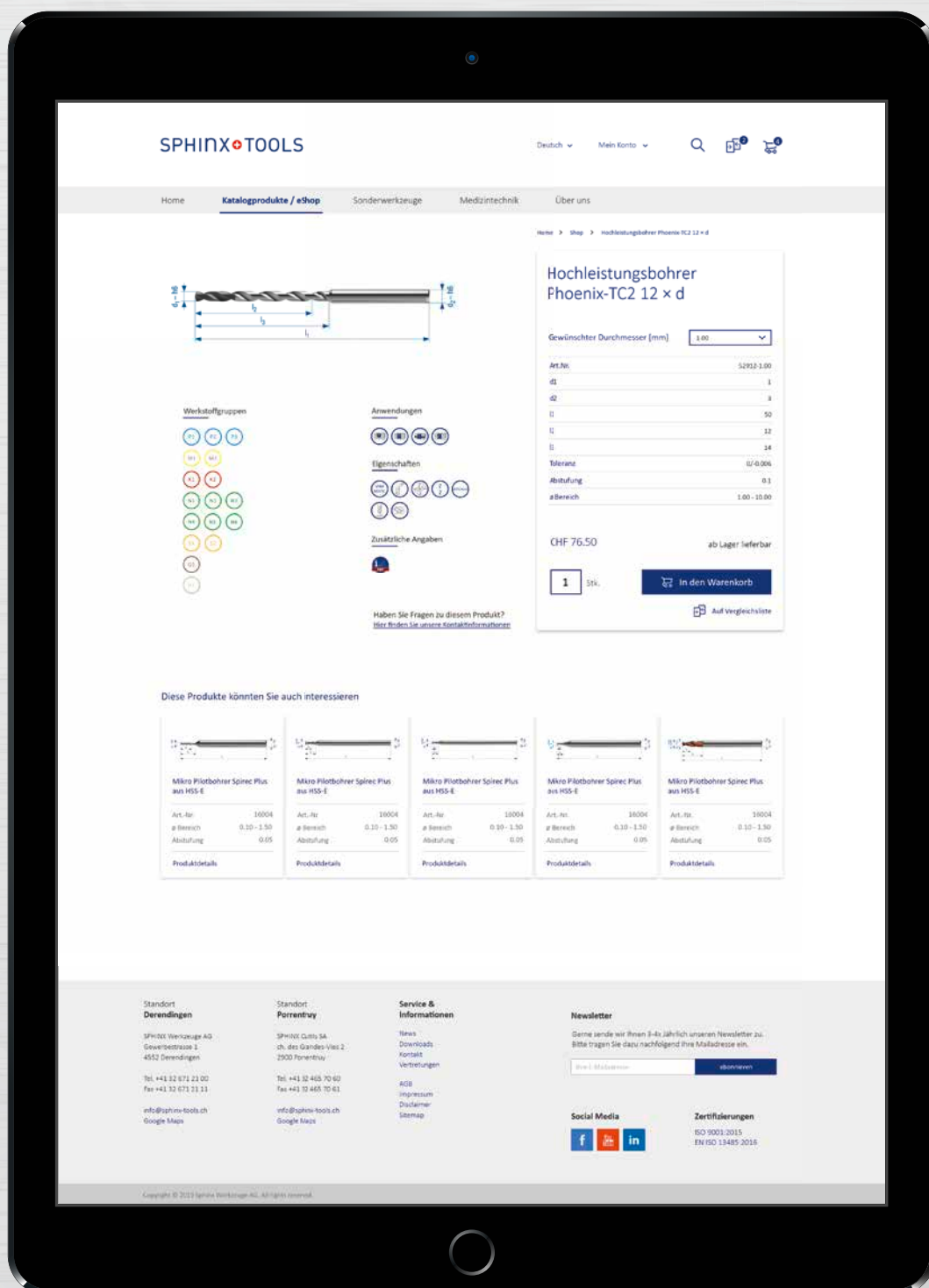


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La Sphinx Utensili SpA è un'azienda leader nella fabbricazione e vendita di utensili di precisione per la lavorazione a taglio.

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 costanti 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.





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

6

Fräsen
Fraisage
Fresare
Milling

70

Anwendungstechnik
Application de la technologie
Applicazione della tecnologia
Application technology

113

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× $\varnothing$	130°	20°	
	56033	0.03–2.99	0.01	2× $\varnothing$	130°	30°	
	56036	0.30–6.00	0.05	2× $\varnothing$	140°/90°	30°	
	16004	0.10–1.50	0.05	2–3× $\varnothing$	130°	20°	
Mikrobohrer Micro foret							
	50695	0.20–1.50	0.01	6× $\varnothing$	118°	30°	
	50699	0.05–2.00	0.01	6× $\varnothing$	118°	30°	

* 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				
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 × $\varnothing$	130°	35°	
	51201	0.20–3.00	0.01	6 × $\varnothing$	130°	35°	
	50621	0.15–3.00	0.01	12 × $\varnothing$	130°	25°	
	50622	0.20–3.00	0.01	12 × $\varnothing$	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 × $\varnothing$	129°	30°	
	50740	0.40–1.50	0.05	40 × $\varnothing$	126°	30°	
	50760	0.40–1.50	0.05	60 × $\varnothing$	126°	30°	
	50780	0.40–1.50	0.05	80 × $\varnothing$	126°	30°	

Hochleistungsbohrer Nirox Foret à grand rendement Nirox

	51609	0.30–3.00	0.05	9 × $\varnothing$	140°	28°	
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Hochleistungsbohrer Phoenix TC2 Foret à grand rendement Phoenix TC2

	52903	1.00–10.00	0.05	3 × $\varnothing$	140°	30°	
	52906	1.00–10.00	0.05	6 × $\varnothing$	140°	30°	
	52909	1.00–10.00	0.10	9 × $\varnothing$	140°	30°	
	52912	1.00–10.00	0.10	12 × $\varnothing$	137°	30°	
	52916	1.00–10.00	0.10	16 × $\varnothing$	137°	30°	
	52920	3.00–10.00	1.00	20 × $\varnothing$	137°	30°	
	52930	3.00–10.00	1.00	30 × $\varnothing$	137°	30°	

* 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	✓	✓	✓	✓	✓		•	 	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
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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 × $\varnothing$	140°	30°	
	50940	1.00–12.70	0.05	6 × $\varnothing$	140°	30°	
	50941	0.50–3.00	0.10	6 × $\varnothing$	140°	30°	
Hochleistungsbohrer Quadro Foret à grand rendement Quadro							
	52100	3.00–19.50	0.50	6 × $\varnothing$	140°	0°	
	52200	3.00–20.00	0.50	12 × $\varnothing$	140°	0°	
	52150	4.00–20.00	0.50	6 × $\varnothing$	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 × $\varnothing$	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 × $\varnothing$	140°	35°	
Reibahlen Alésoir							
	58000	0.987–6.018	0.01	–8 × $\varnothing$		10°	
	58500	0.987–6.018	0.01	–8 × $\varnothing$		10°	

* 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		

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

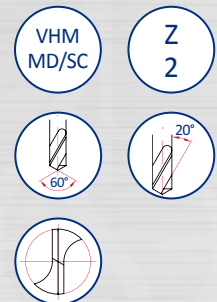
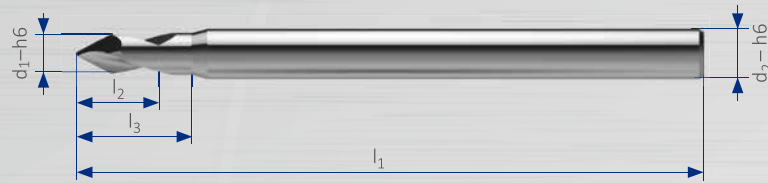
Alesatore

Reamer

VHM/MD/SC	✓	✓	✓	✓	•			 	67
VHM/MD/SC	✓	✓	✓	✓	•				68

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

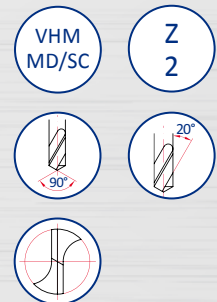
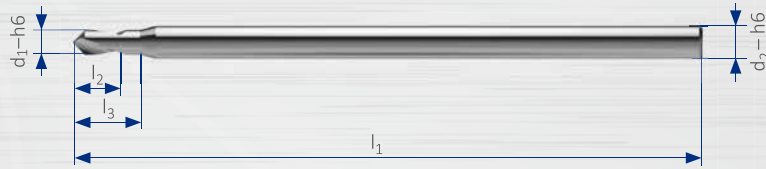
Art. 50806



d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm
0.50	1.50	2.00	38	3.00
0.60	1.50	2.00	38	3.00
0.70	1.50	2.00	38	3.00
0.80	2.00	2.50	38	3.00
0.90	2.00	2.50	38	3.00
1.00	2.00	2.50	38	3.00
1.10	2.50	3.50	38	3.00
1.20	2.50	3.50	38	3.00
1.30	2.50	3.50	38	3.00
1.40	3.00	4.00	38	3.00
1.50	3.00	4.00	38	3.00
1.60	3.00	4.00	38	3.00
1.70	4.00	5.00	38	3.00
1.80	4.00	5.00	38	3.00
1.90	4.00	5.00	38	3.00
2.00	5.00	6.00	38	3.00
2.10	5.00	6.00	38	3.00
2.20	5.00	6.00	38	3.00
2.30	6.00	7.00	38	3.00
2.40	6.00	7.00	38	3.00
2.50	6.00	7.00	38	3.00
2.60	7.00	8.00	38	3.00
2.70	7.00	8.00	38	3.00
2.80	7.00	8.00	38	3.00
2.90	7.00	8.00	38	3.00
3.00	9.50	9.50	38	3.00
4.00	10.50	10.50	40	4.00
5.00	16.00	16.00	50	5.00
6.00	16.00	16.00	50	6.00

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

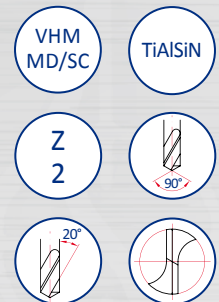
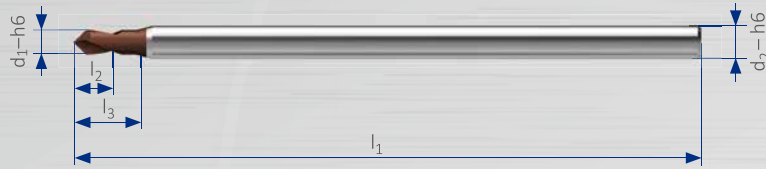
Art. 50809



d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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



d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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. 50810

P1-3

M1,2

K1,2

N1-8

O1



VHM
MD/SC

Z
2



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

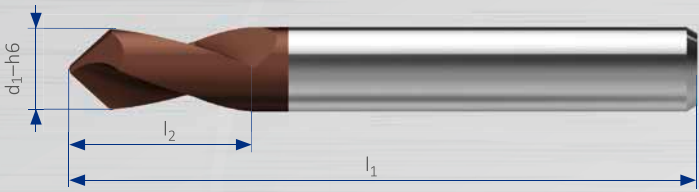
N1-8

S1

H1

O1,2



VHM MD/SC

TiAlSiN

Z 2

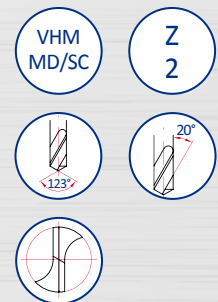





d_1 mm	l_2 mm	l_1 mm
2.00	8.50	25
3.00	9.50	32
4.00	10.50	40
5.00	16.00	50
6.00	16.00	50
8.00	20.00	60
10.00	22.00	70
12.00	22.00	70

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

Art. 50812



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

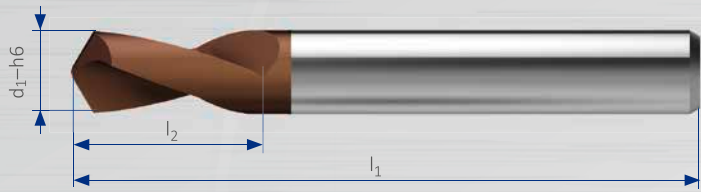
N1-8

S1

H1

O1,2



VHM MD/SC

TiAlSiN

Z 2





i

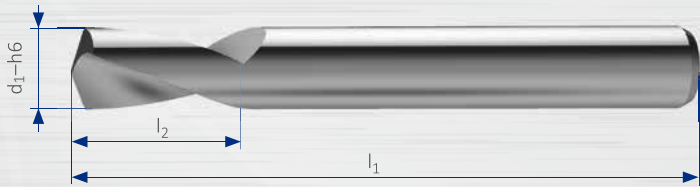
116

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

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
-
-
-



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

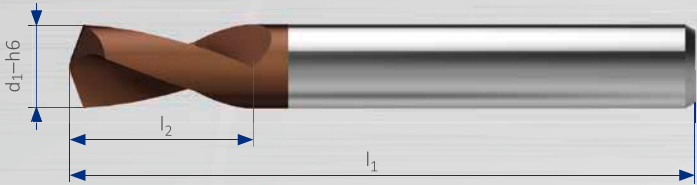
K1,2

N1-8

S1

H1

O1,2



VHM MD/SC

TiAlSiN

Z 2

i

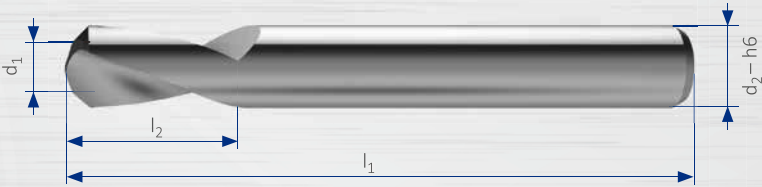
116

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

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
- 90° 142°
- 20°
- ISO symbol for spotting and chamfering



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

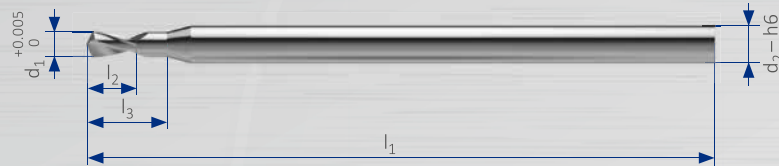
Pilotbohrer
Foret de préperçage
Punta per preforo
Pilot drill

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

i
117

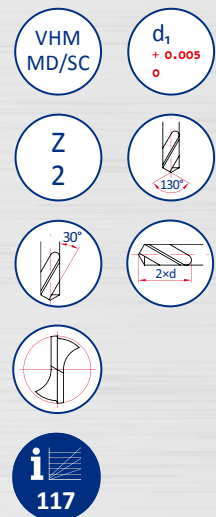
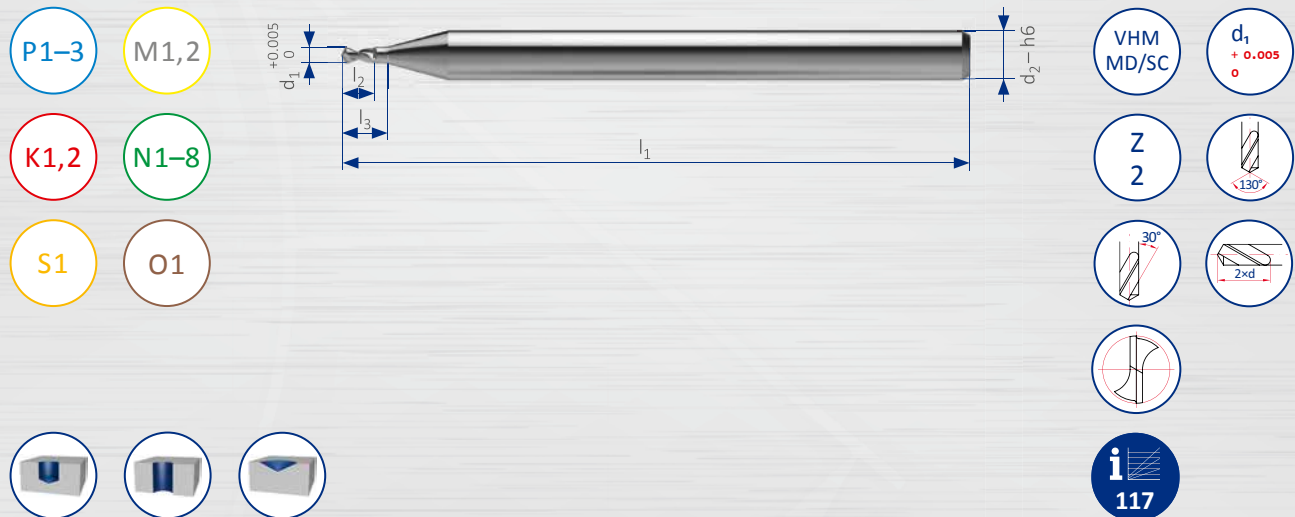
10



d1	l2	l3	l1	d2
mm	mm	mm	mm	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

Pilotbohrer
Foret de préperçage
Punta per preforo
Pilot drill

Art. 56033

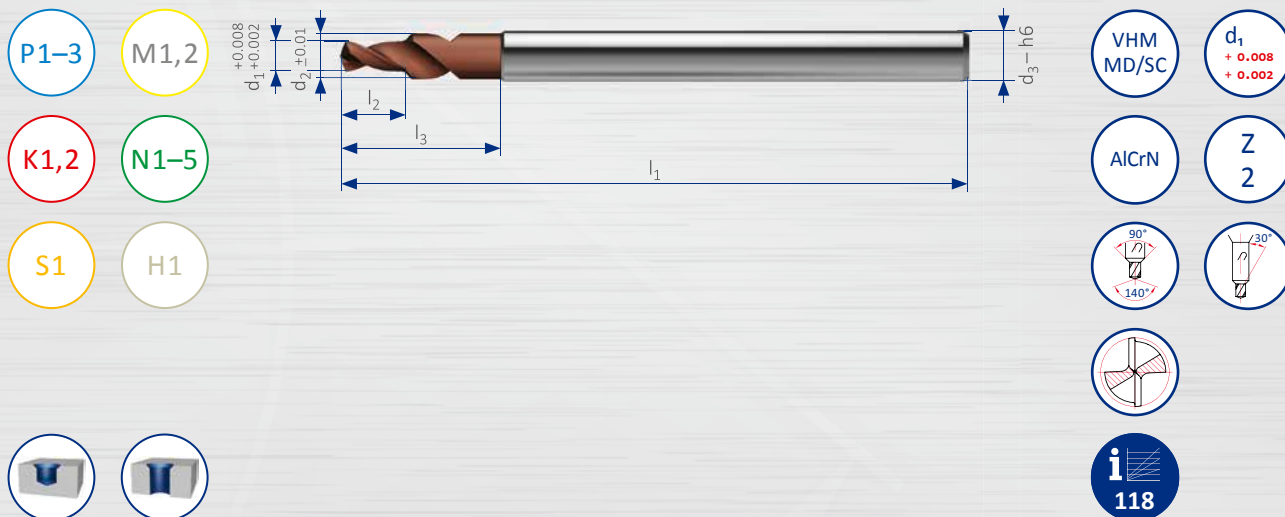


d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.03	0.15	0.30	38	3.00	0.41	0.82	1.60	38	3.00	0.79	1.58	2.30	38	3.00	1.17	2.34	3.80	38	3.00
0.04	0.15	0.30	38	3.00	0.42	0.84	1.60	38	3.00	0.80	1.60	2.30	38	3.00	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	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.55	3.10	5.10	38	3.00	1.93	3.86	5.90	38	3.00	2.31	4.62	6.70	38	3.00	2.69	5.38	7.40	38	3.00
1.56	3.12	5.20	38	3.00	1.94	3.88	5.90	38	3.00	2.32	4.64	6.70	38	3.00	2.70	5.40	7.40	38	3.00
1.57	3.14	5.20	38	3.00	1.95	3.90	5.90	38	3.00	2.33	4.66	6.70	38	3.00	2.71	5.42	7.50	38	3.00
1.58	3.16	5.20	38	3.00	1.96	3.92	6.00	38	3.00	2.34	4.68	6.70	38	3.00	2.72	5.44	7.50	38	3.00
1.59	3.18	5.20	38	3.00	1.97	3.94	6.00	38	3.00	2.35	4.70	6.70	38	3.00	2.73	5.46	7.50	38	3.00
1.60	3.20	5.20	38	3.00	1.98	3.96	6.00	38	3.00	2.36	4.72	6.80	38	3.00	2.74	5.48	7.50	38	3.00
1.61	3.22	5.30	38	3.00	1.99	3.98	6.00	38	3.00	2.37	4.74	6.80	38	3.00	2.75	5.50	7.50	38	3.00
1.62	3.24	5.30	38	3.00	2.00	4.00	6.00	38	3.00	2.38	4.76	6.80	38	3.00	2.76	5.52	7.60	38	3.00
1.63	3.26	5.30	38	3.00	2.01	4.02	6.10	38	3.00	2.39	4.78	6.80	38	3.00	2.77	5.54	7.60	38	3.00
1.64	3.28	5.30	38	3.00	2.02	4.04	6.10	38	3.00	2.40	4.80	6.80	38	3.00	2.78	5.56	7.60	38	3.00
1.65	3.30	5.30	38	3.00	2.03	4.06	6.10	38	3.00	2.41	4.82	6.90	38	3.00	2.79	5.58	7.60	38	3.00
1.66	3.32	5.40	38	3.00	2.04	4.08	6.10	38	3.00	2.42	4.84	6.90	38	3.00	2.80	5.60	7.60	38	3.00
1.67	3.34	5.40	38	3.00	2.05	4.10	6.10	38	3.00	2.43	4.86	6.90	38	3.00	2.81	5.62	7.70	38	3.00
1.68	3.36	5.40	38	3.00	2.06	4.12	6.20	38	3.00	2.44	4.88	6.90	38	3.00	2.82	5.64	7.70	38	3.00
1.69	3.38	5.40	38	3.00	2.07	4.14	6.20	38	3.00	2.45	4.90	6.90	38	3.00	2.83	5.66	7.70	38	3.00
1.70	3.40	5.40	38	3.00	2.08	4.16	6.20	38	3.00	2.46	4.92	7.00	38	3.00	2.84	5.68	7.70	38	3.00
1.71	3.42	5.50	38	3.00	2.09	4.18	6.20	38	3.00	2.47	4.94	7.00	38	3.00	2.85	5.70	7.70	38	3.00
1.72	3.44	5.50	38	3.00	2.10	4.20	6.20	38	3.00	2.48	4.96	7.00	38	3.00	2.86	5.72	7.80	38	3.00
1.73	3.46	5.50	38	3.00	2.11	4.22	6.30	38	3.00	2.49	4.98	7.00	38	3.00	2.87	5.74	7.80	38	3.00
1.74	3.48	5.50	38	3.00	2.12	4.24	6.30	38	3.00	2.50	5.00	7.00	38	3.00	2.88	5.76	7.80	38	3.00
1.75	3.50	5.50	38	3.00	2.13	4.26	6.30	38	3.00	2.51	5.02	7.10	38	3.00	2.89	5.78	7.80	38	3.00
1.76	3.52	5.60	38	3.00	2.14	4.28	6.30	38	3.00	2.52	5.04	7.10	38	3.00	2.90	5.80	7.80	38	3.00
1.77	3.54	5.60	38	3.00	2.15	4.30	6.30	38	3.00	2.53	5.06	7.10	38	3.00	2.91	5.82	7.90	38	3.00
1.78	3.56	5.60	38	3.00	2.16	4.32	6.40	38	3.00	2.54	5.08	7.10	38	3.00	2.92	5.84	7.90	38	3.00
1.79	3.58	5.60	38	3.00	2.17	4.34	6.40	38	3.00	2.55	5.10	7.10	38	3.00	2.93	5.86	7.90	38	3.00
1.80	3.60	5.60	38	3.00	2.18	4.36	6.40	38	3.00	2.56	5.12	7.20	38	3.00	2.94	5.88	7.90	38	3.00
1.81	3.62	5.70	38	3.00	2.19	4.38	6.40	38	3.00	2.57	5.14	7.20	38	3.00	2.95	5.90	7.90	38	3.00
1.82	3.64	5.70	38	3.00	2.20	4.40	6.40	38	3.00	2.58	5.16	7.20	38	3.00	2.96	5.92	8.00	38	3.00
1.83	3.66	5.70	38	3.00	2.21	4.42	6.50	38	3.00	2.59	5.18	7.20	38	3.00	2.97	5.94	8.00	38	3.00
1.84	3.68	5.70	38	3.00	2.22	4.44	6.50	38	3.00	2.60	5.20	7.20	38	3.00	2.98	5.96	8.00	38	3.00
1.85	3.70	5.70	38	3.00	2.23	4.46	6.50	38	3.00	2.61	5.22	7.30	38	3.00	2.99	5.98	8.00	38	3.00
1.86	3.72	5.80	38	3.00	2.24	4.48	6.50	38	3.00	2.62	5.24	7.30	38	3.00					
1.87	3.74	5.80	38	3.00	2.25	4.50	6.50	38	3.00	2.63	5.26	7.30	38	3.00					
1.88	3.76	5.80	38	3.00	2.26	4.52	6.60	38	3.00	2.64	5.28	7.30	38	3.00					
1.89	3.78	5.80	38	3.00	2.27	4.54	6.60	38	3.00	2.65	5.30	7.30	38	3.00					
1.90	3.80	5.80	38	3.00	2.28	4.56	6.60	38	3.00	2.66	5.32	7.40	38	3.00					
1.91	3.82	5.90	38	3.00	2.29	4.58	6.60	38	3.00	2.67	5.34	7.40	38	3.00					
1.92	3.84	5.90	38	3.00	2.30	4.60	6.60	38	3.00	2.68	5.36	7.40	38	3.00					

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

Art. 56036



d ₁	d ₂	l ₂	l ₃	l ₁	d ₃
mm	mm	mm	mm	mm	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

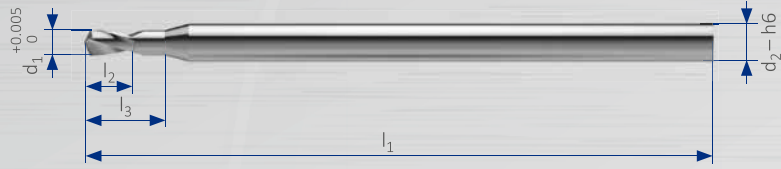
d ₁	d ₂	l ₂	l ₃	l ₁	d ₃
mm	mm	mm	mm	mm	mm
2.10	3.20	4.20	11.00	50	4.00
2.15	3.20	4.30	11.00	50	4.00
2.20	3.20	4.40	11.00	50	4.00
2.25	3.40	4.50	12.00	50	4.00
2.30	3.40	4.60	12.00	50	4.00
2.35	3.40	4.70	12.00	50	4.00
2.40	3.40	4.80	12.00	50	4.00
2.45	3.60	4.90	12.70	50	4.00
2.50	3.60	5.00	12.70	50	4.00
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

d ₁	d ₂	l ₂	l ₃	l ₁	d ₃
mm	mm	mm	mm	mm	mm
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

d ₁	d ₂	l ₂	l ₃	l ₁	d ₃
mm	mm	mm	mm	mm	mm
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

Pilot drill Spirec

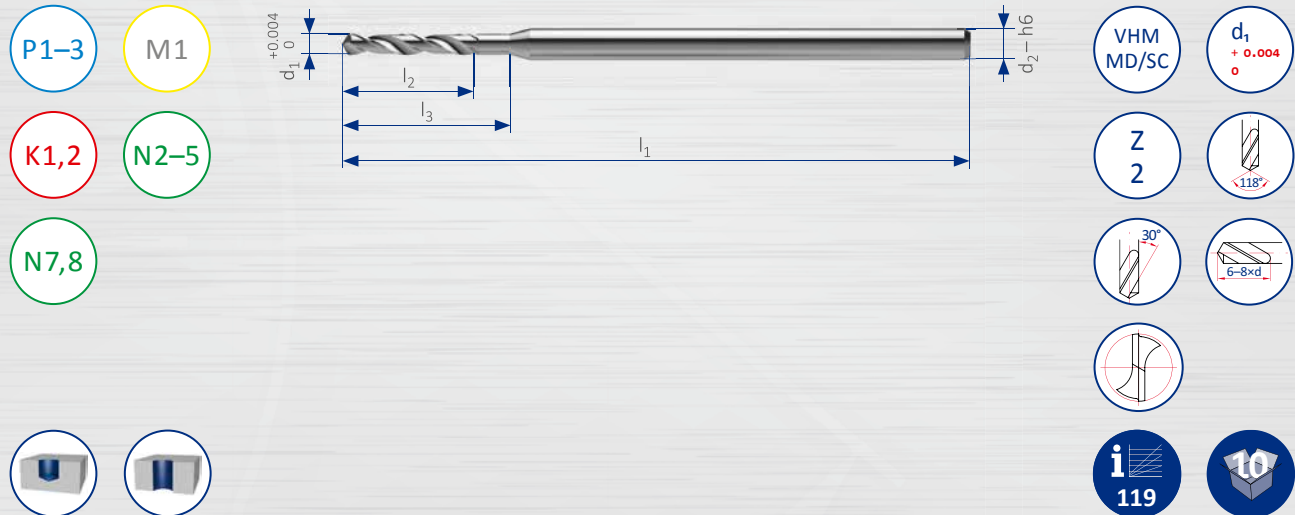
Art. 16004



d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm
0.10	0.40	0.60	25	1.50
0.15	0.40	0.60	25	1.50
0.20	0.60	0.90	25	1.50
0.25	0.60	0.90	25	1.50
0.30	0.90	1.20	25	1.50
0.35	0.90	1.20	25	1.50
0.40	0.90	1.60	25	1.50
0.45	0.90	1.60	25	1.50
0.50	1.00	1.80	25	1.50
0.55	1.00	1.80	25	1.50
0.60	1.20	2.00	25	1.50
0.65	1.20	2.00	25	1.50
0.70	1.50	2.50	25	1.50
0.75	1.50	2.50	25	1.50
0.80	1.50	2.50	25	1.50
0.85	1.50	2.50	25	1.50
0.90	1.60	2.60	25	1.50
0.95	1.60	2.60	25	1.50
1.00	2.00	3.20	25	1.50
1.05	2.00	3.20	25	1.50
1.10	2.30	3.50	25	1.50
1.15	2.30	3.50	25	1.50
1.20	2.30	3.50	25	1.50
1.25	2.30	3.50	25	1.50
1.30	2.70	4.20	25	1.50
1.35	2.70	4.20	25	1.50
1.40	2.70	4.20	25	1.50
1.45	2.70	4.20	25	1.50
1.50	3.00	4.20	25	1.50

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

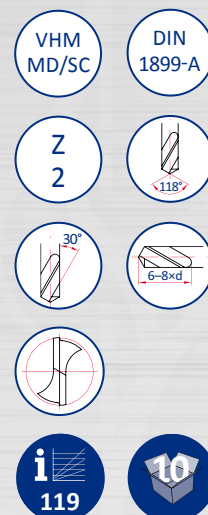
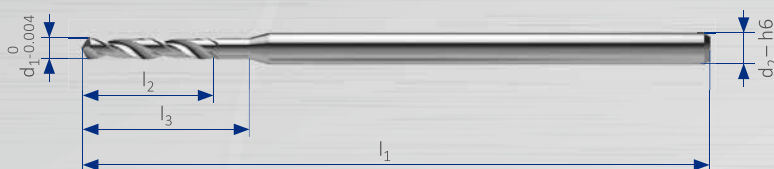
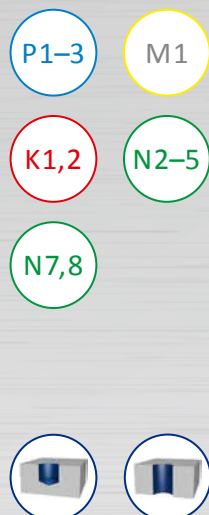
Art. 50695



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	30	1.00	0.58	3.60	4.50	30	1.00	0.96	6.50	8.00	30	1.50	1.34	9.20	11.20	30	1.50
0.21	1.50	1.80	30	1.00	0.59	3.60	4.50	30	1.00	0.97	6.50	8.00	30	1.50	1.35	9.20	11.20	30	1.50
0.22	1.50	1.80	30	1.00	0.60	3.60	4.50	30	1.00	0.98	6.50	8.00	30	1.50	1.36	9.20	11.20	30	1.50
0.23	1.50	1.80	30	1.00	0.61	3.90	5.00	30	1.00	0.99	6.50	8.00	30	1.50	1.37	9.20	11.20	30	1.50
0.24	1.50	1.80	30	1.00	0.62	3.90	5.00	30	1.00	1.00	6.50	8.00	30	1.50	1.38	9.20	11.20	30	1.50
0.25	1.90	2.20	30	1.00	0.63	3.90	5.00	30	1.00	1.01	6.50	8.00	30	1.50	1.39	9.20	11.20	30	1.50
0.26	1.90	2.20	30	1.00	0.64	3.90	5.00	30	1.00	1.02	6.50	8.00	30	1.50	1.40	9.20	11.20	30	1.50
0.27	1.90	2.20	30	1.00	0.65	3.90	5.00	30	1.00	1.03	6.50	8.00	30	1.50	1.41	9.20	11.20	30	1.50
0.28	1.90	2.20	30	1.00	0.66	3.90	5.00	30	1.00	1.04	6.50	8.00	30	1.50	1.42	9.20	11.20	30	1.50
0.29	1.90	2.20	30	1.00	0.67	3.90	5.00	30	1.00	1.05	6.50	8.00	30	1.50	1.43	9.20	11.20	30	1.50
0.30	1.90	2.20	30	1.00	0.68	4.50	5.60	30	1.00	1.06	7.30	9.00	30	1.50	1.44	9.20	11.20	30	1.50
0.31	2.40	2.80	30	1.00	0.69	4.50	5.60	30	1.00	1.07	7.30	9.00	30	1.50	1.45	9.20	11.20	30	1.50
0.32	2.40	2.80	30	1.00	0.70	4.50	5.60	30	1.00	1.08	7.30	9.00	30	1.50	1.46	9.20	11.20	30	1.50
0.33	2.40	2.80	30	1.00	0.71	4.50	5.60	30	1.00	1.09	7.30	9.00	30	1.50	1.47	9.20	11.20	30	1.50
0.34	2.40	2.80	30	1.00	0.72	4.50	5.60	30	1.00	1.10	7.30	9.00	30	1.50	1.48	9.20	11.20	30	1.50
0.35	2.40	2.80	30	1.00	0.73	4.50	5.60	30	1.00	1.11	7.30	9.00	30	1.50	1.49	9.20	11.20	30	1.50
0.36	2.40	2.80	30	1.00	0.74	4.50	5.60	30	1.00	1.12	7.30	9.00	30	1.50	1.50	9.20	11.20	30	1.50
0.37	2.40	2.80	30	1.00	0.75	4.50	5.60	30	1.00	1.13	7.30	9.00	30	1.50					
0.38	2.40	2.80	30	1.00	0.76	5.00	6.30	30	1.00	1.14	7.30	9.00	30	1.50					
0.39	2.70	3.60	30	1.00	0.77	5.00	6.30	30	1.00	1.15	7.30	9.00	30	1.50					
0.40	2.70	3.60	30	1.00	0.78	5.00	6.30	30	1.00	1.16	8.20	10.00	30	1.50					
0.41	2.70	3.60	30	1.00	0.79	5.00	6.30	30	1.00	1.17	8.20	10.00	30	1.50					
0.42	2.70	3.60	30	1.00	0.80	5.00	6.30	30	1.50	1.18	8.20	10.00	30	1.50					
0.43	2.70	3.60	30	1.00	0.81	5.00	6.30	30	1.50	1.19	8.20	10.00	30	1.50					
0.44	2.70	3.60	30	1.00	0.82	5.00	6.30	30	1.50	1.20	8.20	10.00	30	1.50					
0.45	2.70	3.60	30	1.00	0.83	5.00	6.30	30	1.50	1.21	8.20	10.00	30	1.50					
0.46	2.70	3.60	30	1.00	0.84	5.00	6.30	30	1.50	1.22	8.20	10.00	30	1.50					
0.47	2.70	3.60	30	1.00	0.85	5.00	6.30	30	1.50	1.23	8.20	10.00	30	1.50					
0.48	2.70	3.60	30	1.00	0.86	5.70	7.10	30	1.50	1.24	8.20	10.00	30	1.50					
0.49	3.20	4.00	30	1.00	0.87	5.70	7.10	30	1.50	1.25	8.20	10.00	30	1.50					
0.50	3.20	4.00	30	1.00	0.88	5.70	7.10	30	1.50	1.26	8.20	10.00	30	1.50					
0.51	3.20	4.00	30	1.00	0.89	5.70	7.10	30	1.50	1.27	8.20	10.00	30	1.50					
0.52	3.20	4.00	30	1.00	0.90	5.70	7.10	30	1.50	1.28	8.20	10.00	30	1.50					
0.53	3.20	4.00	30	1.00	0.91	5.70	7.10	30	1.50	1.29	8.20	10.00	30	1.50					
0.54	3.60	4.50	30	1.00	0.92	5.70	7.10	30	1.50	1.30	8.20	10.00	30	1.50					
0.55	3.60	4.50	30	1.00	0.93	5.70	7.10	30	1.50	1.31	9.20	11.20	30	1.50					
0.56	3.60	4.50	30	1.00	0.94	5.70	7.10	30	1.50	1.32	9.20	11.20	30	1.50					
0.57	3.60	4.50	30	1.00	0.95	5.70	7.10	30	1.50	1.33	9.20	11.20	30	1.50					

Mikrobohrer Spirec
Micro foret Spirec
Micro punta Spirec
Micro drill Spirec

Art. 50699



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	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



d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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

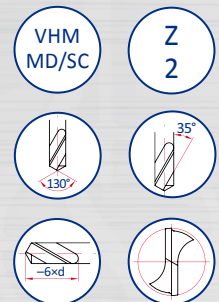
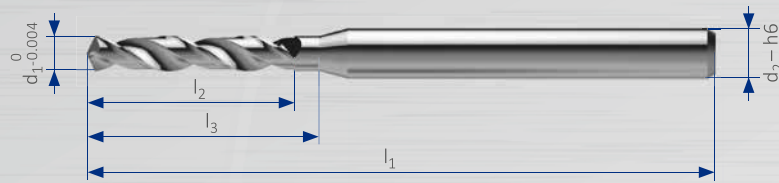
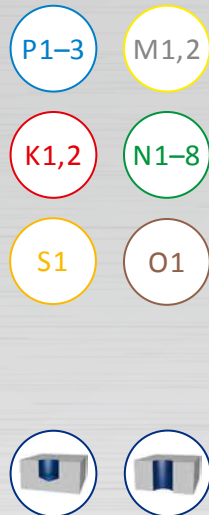
d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm
1.69	11.20	13.40	38	2.00
1.70	11.20	13.40	38	2.00
1.71	11.20	13.40	38	2.00
1.72	11.20	13.40	38	2.00
1.73	11.20	13.40	38	2.00
1.74	11.20	13.40	38	2.00
1.75	11.20	13.40	38	2.00
1.76	11.20	13.40	38	2.00
1.77	11.20	13.40	38	2.00
1.78	11.20	13.40	38	2.00
1.79	11.20	13.40	38	2.00
1.80	11.20	13.40	38	2.00

d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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



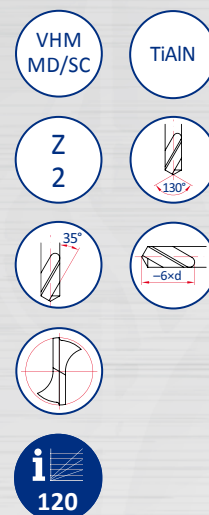
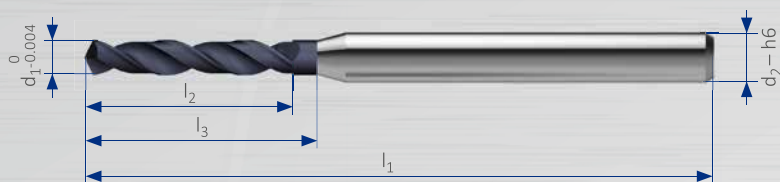
d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.03	0.25	0.35	38	3.00	0.41	2.70	3.60	38	3.00	0.79	5.00	6.30	38	3.00	1.17	8.20	10.00	38	3.00
0.04	0.30	0.40	38	3.00	0.42	2.70	3.60	38	3.00	0.80	5.00	6.30	38	3.00	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



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

Mikrobohrer
Micro foret
Micro punta
Micro drill

Art. 51201

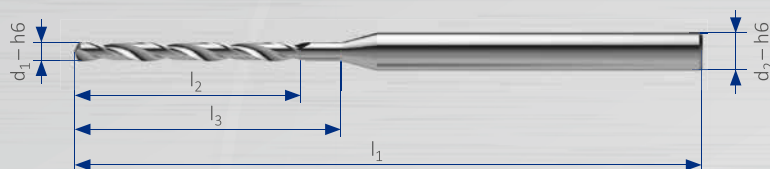


d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.20	1.50	1.80	38	3.00	0.58	3.60	4.50	38	3.00	0.96	6.50	8.00	38	3.00	1.34	9.20	11.20	38	3.00
0.21	1.50	1.80	38	3.00	0.59	3.60	4.50	38	3.00	0.97	6.50	8.00	38	3.00	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



Mikrobohrer
Micro foret
Micro punta
Micro drill

Art. 50621



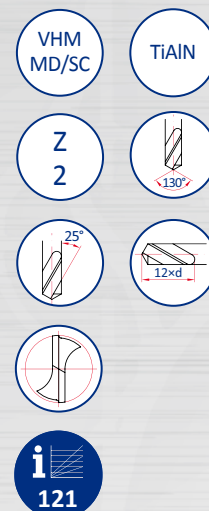
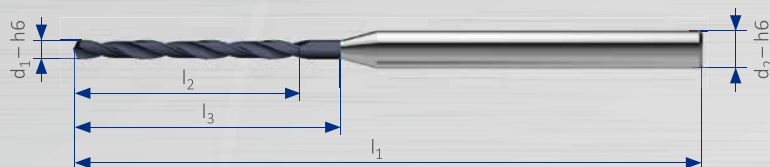
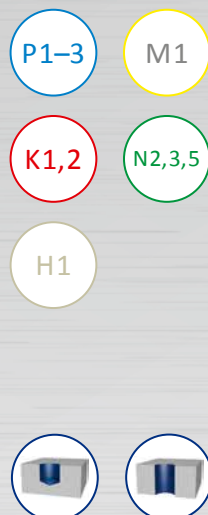
d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.15	2.50	3.50	38	3.00	0.53	6.40	7.50	38	3.00	0.91	10.90	12.50	38	3.00	1.29	15.50	18.00	50	3.00
0.16	2.50	3.50	38	3.00	0.54	6.50	7.50	38	3.00	0.92	11.10	13.00	38	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



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
1.67	20.10	23.00	50	3.00	2.01	24.10	27.50	60	3.00	2.35	28.20	31.50	65	3.00	2.69	32.30	36.00	65	3.00
1.68	20.20	23.00	50	3.00	2.02	24.20	27.50	60	3.00	2.36	28.30	31.50	65	3.00	2.70	32.40	36.50	65	3.00
1.69	20.30	23.00	50	3.00	2.03	24.40	27.50	60	3.00	2.37	28.40	32.00	65	3.00	2.71	32.50	36.50	65	3.00
1.70	20.40	23.50	50	3.00	2.04	24.50	27.50	60	3.00	2.38	28.60	32.00	65	3.00	2.72	32.60	36.50	65	3.00
1.71	20.50	23.50	50	3.00	2.05	24.60	28.00	60	3.00	2.39	28.70	32.00	65	3.00	2.73	32.80	36.50	65	3.00
1.72	20.70	23.50	50	3.00	2.06	24.70	28.00	60	3.00	2.40	28.80	32.00	65	3.00	2.74	32.90	37.00	65	3.00
1.73	20.80	23.50	50	3.00	2.07	24.80	28.00	60	3.00	2.41	28.90	33.00	65	3.00	2.75	33.00	37.00	65	3.00
1.74	20.90	24.00	50	3.00	2.08	25.00	28.00	60	3.00	2.42	29.00	33.00	65	3.00	2.76	33.10	37.00	65	3.00
1.75	21.00	24.00	50	3.00	2.09	25.10	28.50	60	3.00	2.43	29.20	33.00	65	3.00	2.77	33.20	37.00	65	3.00
1.76	21.10	24.00	50	3.00	2.10	25.20	28.50	60	3.00	2.44	29.30	33.00	65	3.00	2.78	33.40	37.50	65	3.00
1.77	21.30	24.00	50	3.00	2.11	25.30	28.50	60	3.00	2.45	29.40	33.00	65	3.00	2.79	33.50	37.50	65	3.00
1.78	21.40	24.50	50	3.00	2.12	25.40	28.50	60	3.00	2.46	29.50	33.50	65	3.00	2.80	33.60	37.50	65	3.00
1.79	21.50	24.50	50	3.00	2.13	25.60	29.00	60	3.00	2.47	29.60	33.50	65	3.00	2.81	33.70	37.50	65	3.00
1.80	21.60	25.00	50	3.00	2.14	25.70	29.00	60	3.00	2.48	29.80	33.50	65	3.00	2.82	33.80	38.00	65	3.00
1.81	21.70	25.00	50	3.00	2.15	25.80	29.00	60	3.00	2.49	29.90	33.50	65	3.00	2.83	34.00	38.00	65	3.00
1.82	21.90	25.00	50	3.00	2.16	25.90	29.00	60	3.00	2.50	30.00	34.00	65	3.00	2.84	34.10	38.00	65	3.00
1.83	22.00	25.00	50	3.00	2.17	26.10	29.50	60	3.00	2.51	30.10	34.00	65	3.00	2.85	34.20	38.00	65	3.00
1.84	22.10	25.50	50	3.00	2.18	26.20	29.50	60	3.00	2.52	30.20	34.00	65	3.00	2.86	34.30	38.50	65	3.00
1.85	22.20	25.50	50	3.00	2.19	26.30	29.50	60	3.00	2.53	30.40	34.00	65	3.00	2.87	34.40	38.50	65	3.00
1.86	22.30	25.50	50	3.00	2.20	26.40	29.50	60	3.00	2.54	30.50	34.50	65	3.00	2.88	34.60	38.50	65	3.00
1.87	22.50	25.50	50	3.00	2.21	26.50	30.00	60	3.00	2.55	30.60	34.50	65	3.00	2.89	34.70	38.50	65	3.00
1.88	22.60	26.00	50	3.00	2.22	26.70	30.00	60	3.00	2.56	30.70	34.50	65	3.00	2.90	34.80	39.00	65	3.00
1.89	22.70	26.00	50	3.00	2.23	26.80	30.00	60	3.00	2.57	30.80	34.50	65	3.00	2.91	34.90	39.00	65	3.00
1.90	22.80	26.00	50	3.00	2.24	26.90	30.00	60	3.00	2.58	31.00	35.00	65	3.00	2.92	35.00	39.00	65	3.00
1.91	22.90	26.00	50	3.00	2.25	27.00	30.50	60	3.00	2.59	31.10	35.00	65	3.00	2.93	35.20	39.00	65	3.00
1.92	23.10	26.50	50	3.00	2.26	27.10	30.50	60	3.00	2.60	31.20	35.00	65	3.00	2.94	35.30	39.50	65	3.00
1.93	23.20	26.50	50	3.00	2.27	27.20	30.50	60	3.00	2.61	31.30	35.00	65	3.00	2.95	35.40	39.50	65	3.00
1.94	23.30	26.50	50	3.00	2.28	27.40	30.50	60	3.00	2.62	31.40	35.50	65	3.00	2.96	35.50	39.50	65	3.00
1.95	23.40	26.50	50	3.00	2.29	27.50	31.00	60	3.00	2.63	31.60	35.50	65	3.00	2.97	35.60	39.50	65	3.00
1.96	23.50	27.00	50	3.00	2.30	27.60	31.00	60	3.00	2.64	31.70	35.50	65	3.00	2.98	35.80	40.00	65	3.00
1.97	23.70	27.00	50	3.00	2.31	27.70	31.00	65	3.00	2.65	31.80	35.50	65	3.00	2.99	35.90	40.00	65	3.00
1.98	23.80	27.00	50	3.00	2.32	27.80	31.00	65	3.00	2.66	31.90	36.00	65	3.00	3.00	36.00	40.00	65	3.00
1.99	23.90	27.00	50	3.00	2.33	28.00	31.50	65	3.00	2.67	32.00	36.00	65	3.00					
2.00	24.00	27.00	50	3.00	2.34	28.10	31.50	65	3.00	2.68	32.20	36.00	65	3.00					

Mikrobohrer
Micro foret
Micro punta
Micro drill

Art. 50622



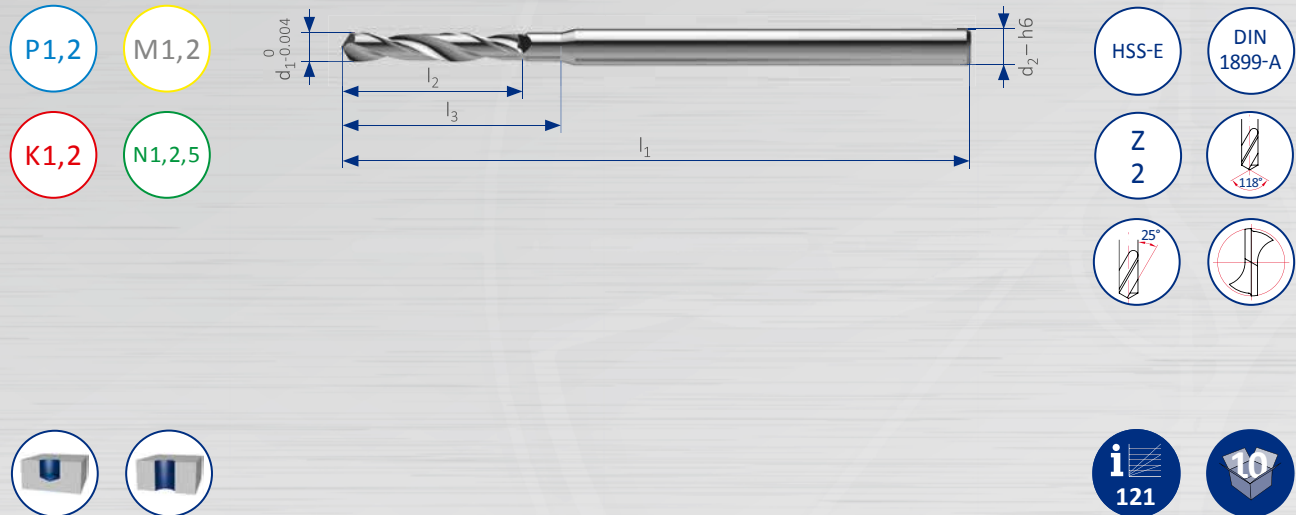
d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm
0.20	2.40	3.50	38	3.00	0.58	7.00	8.00	38	3.00	0.96	11.50	13.50	38	3.00	1.34	16.10	18.50	50	3.00
0.21	2.50	3.50	38	3.00	0.59	7.10	8.00	38	3.00	0.97	11.70	13.50	38	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



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

Mikrobohrer Spirec
Micro foret Spirec
Micro punta Spirec
Micro drill Spirec

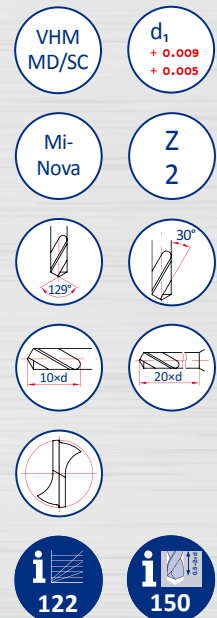
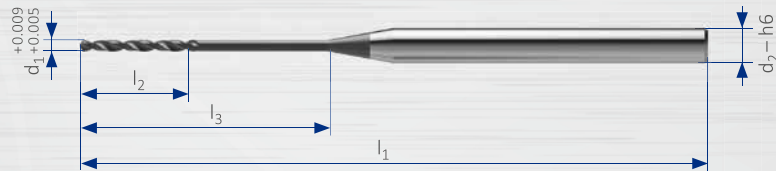
Art. 12604



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	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	1.90	11.70	14.00	38	2.00
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	1.95	11.70	14.00	38	2.00
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	1.984	11.70	14.00	38	2.00
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	2.00	12.70	15.00	43	2.50
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	2.05	12.70	15.00	43	2.50
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	2.10	12.70	15.00	43	2.50
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	2.15	12.70	15.00	43	2.50
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	2.20	13.70	17.00	43	2.50
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	2.25	13.70	17.00	43	2.50
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	2.30	13.70	17.00	43	2.50
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	2.35	13.70	17.00	43	2.50
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	2.381	13.70	17.00	43	2.50
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	2.40	14.70	18.00	43	2.50
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	2.45	14.70	18.00	43	2.50
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	2.50	14.70	18.00	46	3.00
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	2.55	15.70	19.00	46	3.00
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	2.60	15.70	19.00	46	3.00
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	2.65	16.70	20.00	46	3.00
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	2.70	16.70	20.00	46	3.00
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	2.75	17.70	21.00	46	3.00
0.25	1.90	2.20	25	1.00	0.63	3.90	5.00	25	1.00	1.05	6.50	8.00	25	1.50	2.778	17.70	21.00	46	3.00
0.26	1.90	2.20	25	1.00	0.64	3.90	5.00	25	1.00	1.10	7.30	9.00	25	1.50	2.80	17.70	21.00	46	3.00
0.27	1.90	2.20	25	1.00	0.65	3.90	5.00	25	1.00	1.15	7.30	9.00	25	1.50	2.85	18.70	22.00	46	3.00
0.28	1.90	2.20	25	1.00	0.66	3.90	5.00	25	1.00	1.20	8.20	10.00	25	1.50	2.90	18.70	22.00	46	3.00
0.29	1.90	2.20	25	1.00	0.67	3.90	5.00	25	1.00	1.25	8.20	10.00	25	1.50	2.95	19.70	23.00	46	3.00
0.30	1.90	2.20	25	1.00	0.68	4.50	5.60	25	1.00	1.30	8.20	10.00	25	1.50	3.00	19.70	23.00	46	3.00
0.31	2.40	2.80	25	1.00	0.69	4.50	5.60	25	1.00	1.35	9.20	11.20	25	1.50	3.175	19.70	23.00	46	3.175
0.32	2.40	2.80	25	1.00	0.70	4.50	5.60	25	1.00	1.40	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	1.45	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	1.50	10.90	12.90	38	2.00					
0.35	2.40	2.80	25	1.00	0.73	4.50	5.60	25	1.00	1.55	11.20	13.40	38	2.00					
0.36	2.40	2.80	25	1.00	0.74	4.50	5.60	25	1.00	1.587	11.20	13.40	38	2.00					
0.37	2.40	2.80	25	1.00	0.75	4.50	5.60	25	1.00	1.60	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	1.65	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	1.70	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	1.75	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	1.80	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	1.85	11.20	13.40	38	2.00					

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

Art. 50720



d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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

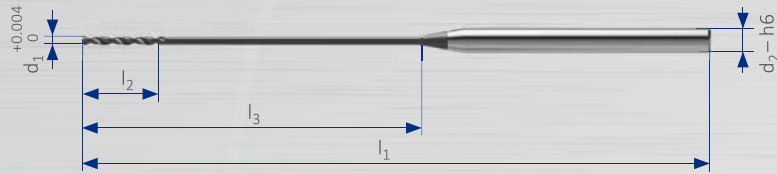
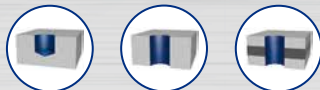
Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50740

P1-3 M1,2

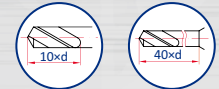
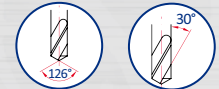
K1,2 N1-6

S1 O1



VHM MD/SC d_1
+0.004
0

Mi-Nova Z
2



i 122

i 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

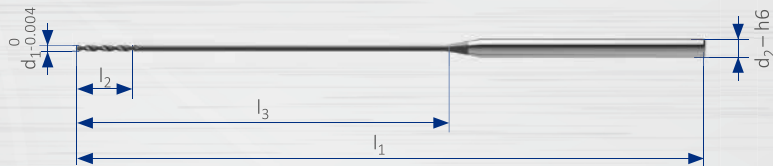
Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50760

P1-3 M1,2

K1,2 N1-6

S1 O1



VHM
MD/SC

Mi-
Nova

Z
2



i
122

i
151

d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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

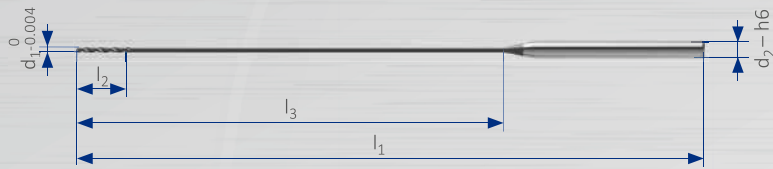
Mikro-Tieflochbohrer
Micro foret de perçage profond
Micro punta per foro profondo
Micro deep hole drill

Art. 50780

P1-3 M1,2

K1,2 N1-6

S1 O1



VHM
MD/SC

Mi-
Nova

Z
2



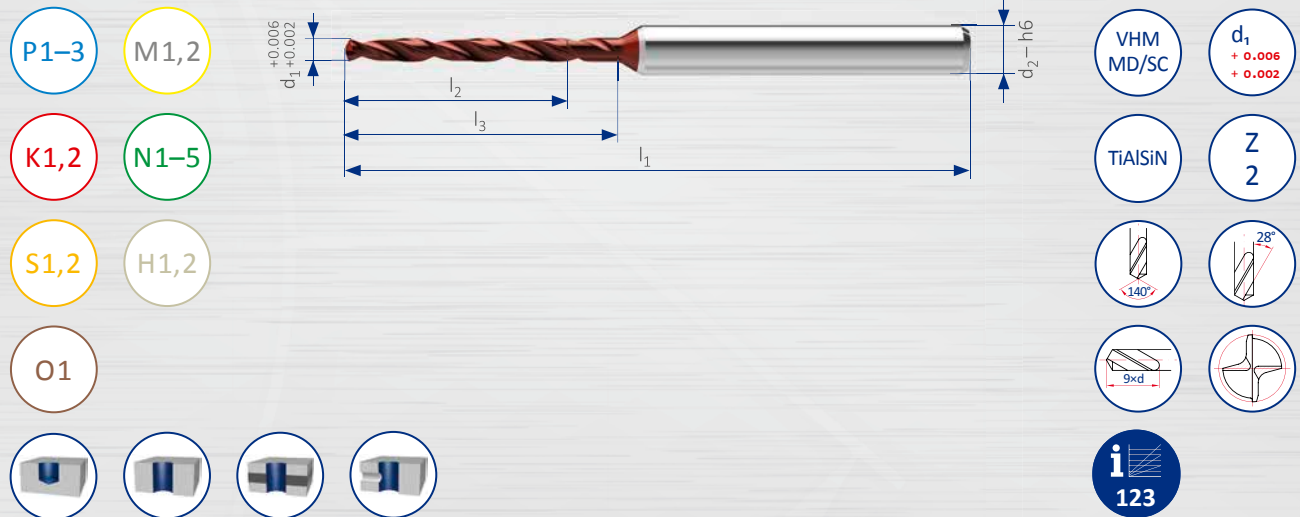
i
122

i
151

d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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

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

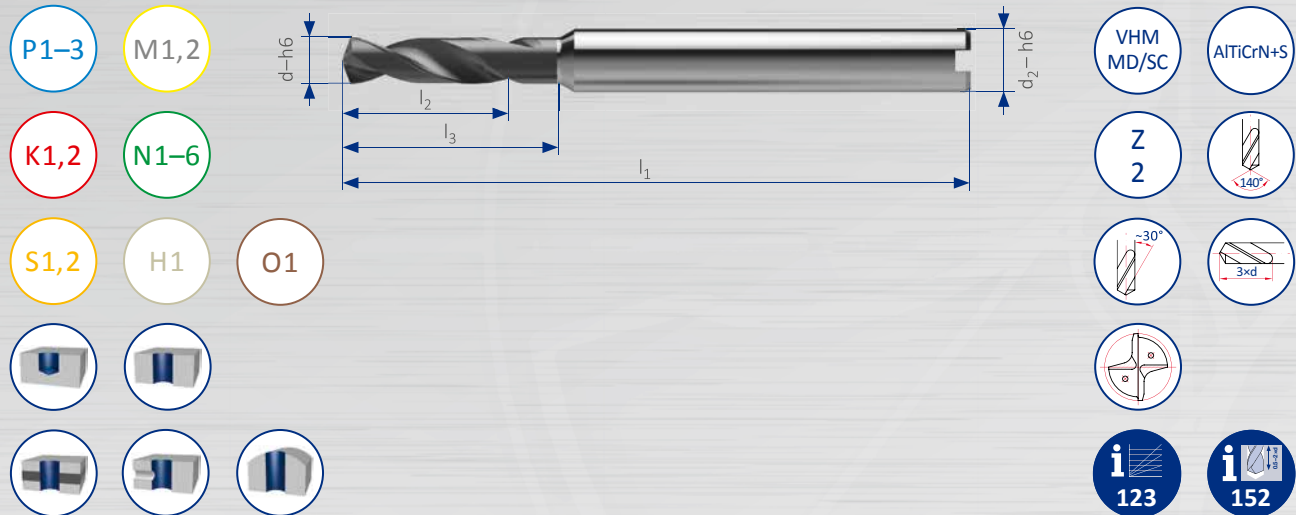
Art. 51609



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
0.30	2.70	3.30	38	3.00	2.20	19.80	24.20	50	3.00
0.35	3.20	3.90	38	3.00	2.25	20.30	24.80	50	3.00
0.40	3.60	4.40	38	3.00	2.30	20.70	25.30	50	3.00
0.45	4.10	5.00	38	3.00	2.35	21.20	25.90	50	3.00
0.50	4.50	5.50	38	3.00	2.40	21.60	26.40	50	3.00
0.55	5.00	6.10	38	3.00	2.45	22.10	27.00	50	3.00
0.60	5.40	6.60	38	3.00	2.50	22.50	27.50	55	3.00
0.65	5.90	7.20	38	3.00	2.55	23.00	28.10	55	3.00
0.70	6.30	7.70	38	3.00	2.60	23.40	28.60	55	3.00
0.75	6.80	8.30	38	3.00	2.65	23.90	29.20	55	3.00
0.80	7.20	8.80	38	3.00	2.70	24.30	29.70	55	3.00
0.85	7.70	9.40	38	3.00	2.75	24.80	30.30	55	3.00
0.90	8.10	9.90	38	3.00	2.80	25.20	30.80	55	3.00
0.95	8.60	10.50	38	3.00	2.85	25.70	31.40	55	3.00
1.00	9.00	11.00	38	3.00	2.90	26.10	31.90	55	3.00
1.05	9.50	11.60	38	3.00	2.95	26.60	32.50	55	3.00
1.10	9.90	12.10	38	3.00	3.00	27.00	33.00	55	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					

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

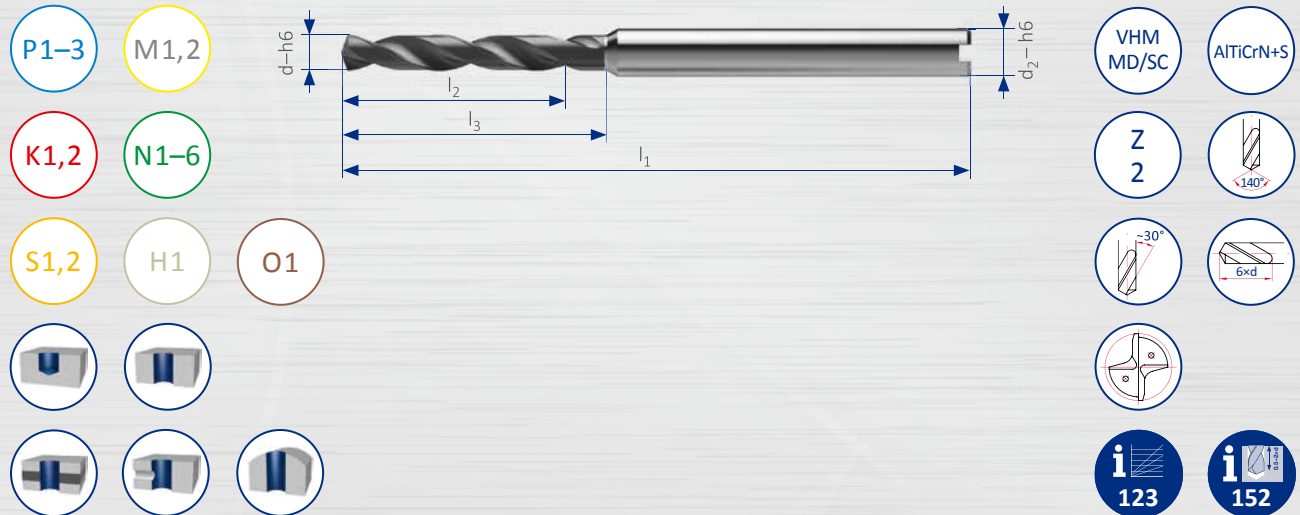
Art. 52903



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.00	3.00	5.00	38	3.00	2.90	8.70	12.00	50	3.00	4.80	14.40	22.50	60	6.00	7.40	22.20	32.00	72	8.00	
1.05	3.15	5.25	38	3.00	2.95	8.85	12.00	50	3.00	4.85	14.55	22.50	60	6.00	7.50	22.50	32.50	72	8.00	
1.10	3.30	5.50	38	3.00	3.00	9.00	12.50	50	3.00	4.90	14.70	22.50	60	6.00	7.60	22.80	32.50	72	8.00	
1.15	3.45	5.50	38	3.00	3.05	9.15	12.50	55	6.00	4.95	14.85	23.00	60	6.00	7.70	23.10	33.50	72	8.00	
1.20	3.60	5.50	38	3.00	3.10	9.30	13.50	55	6.00	5.00	15.00	23.00	60	6.00	7.80	23.40	33.50	72	8.00	
1.25	3.75	6.00	38	3.00	3.15	9.45	13.50	55	6.00	5.05	15.15	23.00	64	6.00	7.90	23.70	34.00	72	8.00	
1.30	3.90	6.00	38	3.00	3.20	9.60	13.50	55	6.00	5.10	15.30	23.50	64	6.00	8.00	24.00	34.00	72	8.00	
1.35	4.05	6.00	38	3.00	3.25	9.75	13.50	55	6.00	5.15	15.45	23.50	64	6.00	8.50	25.50	36.50	79	10.00	
1.40	4.20	6.50	38	3.00	3.30	9.90	13.50	55	6.00	5.20	15.60	23.50	64	6.00	9.00	27.00	38.00	79	10.00	
1.45	4.35	6.50	38	3.00	3.35	10.05	14.00	55	6.00	5.25	15.75	23.50	64	6.00	9.50	28.50	40.00	85	10.00	
1.50	4.50	6.50	38	3.00	3.40	10.20	14.00	55	6.00	5.30	15.90	24.00	64	6.00	10.00	30.00	42.00	85	10.00	
1.55	4.65	7.50	38	3.00	3.45	10.35	14.00	55	6.00	5.35	16.05	24.00	64	6.00						
1.60	4.80	7.50	38	3.00	3.50	10.50	14.50	55	6.00	5.40	16.20	24.00	64	6.00						
1.65	4.95	8.00	38	3.00	3.55	10.65	14.50	55	6.00	5.45	16.35	24.00	64	6.00						
1.70	5.10	8.00	38	3.00	3.60	10.80	15.00	55	6.00	5.50	16.50	24.50	64	6.00						
1.75	5.25	8.00	38	3.00	3.65	10.95	15.00	55	6.00	5.55	16.65	24.50	64	6.00						
1.80	5.40	8.50	38	3.00	3.70	11.10	15.00	55	6.00	5.60	16.80	24.50	64	6.00						
1.85	5.55	8.50	38	3.00	3.75	11.25	15.00	55	6.00	5.65	16.95	24.50	64	6.00						
1.90	5.70	8.50	38	3.00	3.80	11.40	15.50	55	6.00	5.70	17.10	25.50	64	6.00						
1.95	5.85	9.00	38	3.00	3.85	11.55	15.50	55	6.00	5.75	17.25	25.50	64	6.00						
2.00	6.00	9.00	38	3.00	3.90	11.70	15.50	55	6.00	5.80	17.40	25.50	64	6.00						
2.05	6.15	9.00	38	3.00	3.95	11.85	15.50	55	6.00	5.85	17.55	25.50	64	6.00						
2.10	6.30	9.50	38	3.00	4.00	12.00	15.50	55	6.00	5.90	17.70	26.00	64	6.00						
2.15	6.45	9.50	38	3.00	4.05	12.15	16.50	60	6.00	5.95	17.85	26.00	64	6.00						
2.20	6.60	9.50	38	3.00	4.10	12.30	18.50	60	6.00	6.00	18.00	27.00	64	6.00						
2.25	6.75	10.00	38	3.00	4.15	12.45	18.50	60	6.00	6.10	18.30	27.50	68	8.00						
2.30	6.90	10.00	38	3.00	4.20	12.60	18.50	60	6.00	6.20	18.60	27.50	68	8.00						
2.35	7.05	10.00	38	3.00	4.25	12.75	18.50	60	6.00	6.30	18.90	28.00	68	8.00						
2.40	7.20	10.00	38	3.00	4.30	12.90	19.00	60	6.00	6.40	19.20	28.00	68	8.00						
2.45	7.35	10.00	38	3.00	4.35	13.05	19.00	60	6.00	6.50	19.50	28.50	68	8.00						
2.50	7.50	10.50	50	3.00	4.40	13.20	19.00	60	6.00	6.60	19.80	29.00	68	8.00						
2.55	7.65	11.00	50	3.00	4.45	13.35	20.50	60	6.00	6.70	20.10	29.50	68	8.00						
2.60	7.80	11.00	50	3.00	4.50	13.50	20.50	60	6.00	6.80	20.40	29.50	68	8.00						
2.65	7.95	11.00	50	3.00	4.55	13.65	20.50	60	6.00	6.90	20.70	30.00	68	8.00						
2.70	8.10	11.50	50	3.00	4.60	13.80	22.00	60	6.00	7.00	21.00	31.00	68	8.00						
2.75	8.25	11.50	50	3.00	4.65	13.95	22.00	60	6.00	7.10	21.30	31.50	72	8.00						
2.80	8.40	11.50	50	3.00	4.70	14.10	22.00	60	6.00	7.20	21.60	31.50	72	8.00						
2.85	8.55	12.00	50	3.00	4.75	14.25	22.00	60	6.00	7.30	21.90	32.00	72	8.00						

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

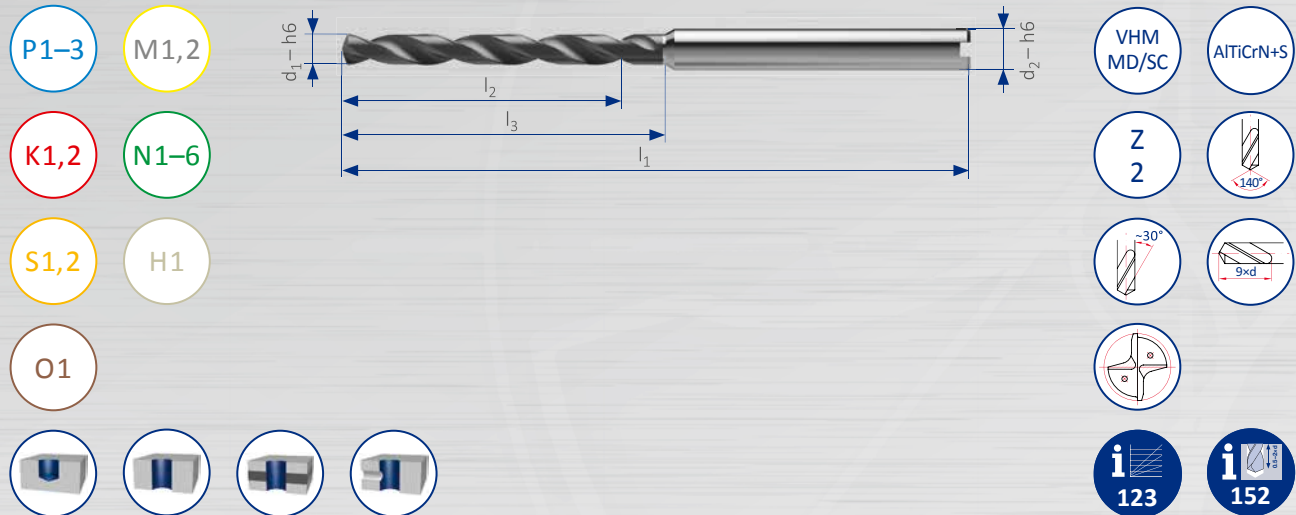
Art. 52906



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.00	6.00	8.00	38	3.00	2.90	17.40	20.40	50	3.00	4.63	27.90	36.00	79	6.00	6.50	39.00	48.00	89	8.00	
1.05	6.30	8.30	38	3.00	2.95	17.70	20.70	50	3.00	4.65	27.90	36.00	79	6.00	6.60	39.60	48.50	89	8.00	
1.10	6.60	8.60	38	3.00	3.00	18.00	21.00	50	3.00	4.67	28.10	36.00	79	6.00	6.70	40.20	49.00	89	8.00	
1.15	6.90	8.90	38	3.00	3.05	18.30	22.30	66	6.00	4.69	28.20	36.00	79	6.00	6.80	40.80	50.00	89	8.00	
1.20	7.20	9.20	38	3.00	3.10	18.60	22.60	66	6.00	4.70	28.20	36.00	79	6.00	6.90	41.40	50.50	89	8.00	
1.25	7.50	9.50	38	3.00	3.15	18.90	22.90	66	6.00	4.75	28.50	37.00	79	6.00	7.00	42.00	52.00	89	8.00	
1.30	7.80	9.80	38	3.00	3.20	19.20	23.20	66	6.00	4.80	28.80	37.00	79	6.00	7.10	42.60	52.50	95	8.00	
1.35	8.10	10.10	38	3.00	3.25	19.50	23.50	66	6.00	4.85	29.10	37.50	79	6.00	7.20	43.20	53.50	95	8.00	
1.40	8.40	10.40	38	3.00	3.30	19.80	23.80	66	6.00	4.90	29.40	37.50	79	6.00	7.30	43.80	54.00	95	8.00	
1.45	8.70	10.70	38	3.00	3.35	20.10	24.10	66	6.00	4.95	29.70	38.00	79	6.00	7.40	44.40	54.50	95	8.00	
1.50	9.00	11.00	38	3.00	3.40	20.40	24.40	66	6.00	5.00	30.00	38.00	79	6.00	7.50	45.00	55.00	95	8.00	
1.55	9.30	11.30	38	3.00	3.45	20.70	24.70	66	6.00	5.05	30.30	38.50	79	6.00	7.60	45.60	55.50	95	8.00	
1.60	9.60	12.60	38	3.00	3.50	21.00	25.00	66	6.00	5.10	30.60	38.50	79	6.00	7.70	46.20	56.00	95	8.00	
1.65	9.90	12.90	38	3.00	3.55	21.30	25.30	66	6.00	5.15	30.90	39.00	79	6.00	7.80	46.80	57.00	95	8.00	
1.70	10.20	13.20	38	3.00	3.60	21.60	25.60	66	6.00	5.20	31.20	39.00	79	6.00	7.90	47.40	57.50	95	8.00	
1.75	10.50	13.50	38	3.00	3.65	21.90	25.90	66	6.00	5.25	31.50	40.00	79	6.00	8.00	48.00	58.00	95	8.00	
1.80	10.80	13.80	38	3.00	3.68	22.20	26.20	66	6.00	5.30	31.80	40.00	79	6.00	8.50	51.00	62.00	106	10.00	
1.85	11.10	14.10	38	3.00	3.70	22.20	26.20	66	6.00	5.35	32.10	40.50	79	6.00	9.00	54.00	65.00	106	10.00	
1.90	11.40	14.40	38	3.00	3.72	22.40	26.40	66	6.00	5.40	32.40	40.50	79	6.00	9.50	57.00	68.00	113	10.00	
1.95	11.70	14.70	38	3.00	3.74	22.50	26.50	66	6.00	5.45	32.70	41.00	79	6.00	10.00	60.00	72.00	113	10.00	
2.00	12.00	15.00	50	3.00	3.75	22.50	26.50	66	6.00	5.50	33.00	41.00	79	6.00						
2.05	12.30	15.30	50	3.00	3.80	22.80	26.80	66	6.00	5.53	33.30	41.50	81	6.00						
2.10	12.60	15.60	50	3.00	3.85	23.10	27.10	66	6.00	5.55	33.30	41.50	81	6.00						
2.15	12.90	15.90	50	3.00	3.90	23.40	27.40	66	6.00	5.57	33.50	41.50	81	6.00						
2.20	13.20	16.20	50	3.00	3.95	23.70	27.70	66	6.00	5.59	33.60	41.50	81	6.00						
2.25	13.50	16.50	50	3.00	4.00	24.00	28.00	66	6.00	5.60	33.60	41.50	81	6.00						
2.30	13.80	16.80	50	3.00	4.05	24.30	30.20	79	6.00	5.65	33.90	42.00	81	6.00						
2.35	14.10	17.10	50	3.00	4.10	24.60	30.50	79	6.00	5.70	34.20	42.00	81	6.00						
2.40	14.40	17.40	50	3.00	4.15	24.90	30.80	79	6.00	5.75	34.50	43.00	81	6.00						
2.45	14.70	17.70	50	3.00	4.20	25.20	31.00	79	6.00	5.80	34.80	43.00	81	6.00						
2.50	15.00	18.00	50	3.00	4.25	25.50	31.50	79	6.00	5.85	35.10	43.50	81	6.00						
2.55	15.30	18.30	50	3.00	4.30	25.80	32.00	79	6.00	5.90	35.40	43.50	81	6.00						
2.60	15.60	18.60	50	3.00	4.35	26.10	32.50	79	6.00	5.95	35.70	44.00	81	6.00						
2.65	15.90	18.90	50	3.00	4.40	26.40	32.50	79	6.00	6.00	36.00	44.00	81	6.00						
2.70	16.20	19.20	50	3.00	4.45	26.70	33.00	79	6.00	6.10	36.60	45.50	89	8.00						
2.75	16.50	19.50	50	3.00	4.50	27.00	33.00	79	6.00	6.20	37.20	46.00	89	8.00						
2.80	16.80	19.80	50	3.00	4.55	27.30	35.50	79	6.00	6.30	37.80	47.00	89	8.00						
2.85	17.10	20.10	50	3.00	4.60	27.60	35.50	79	6.00	6.40	38.40	47.50	89	8.00						

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

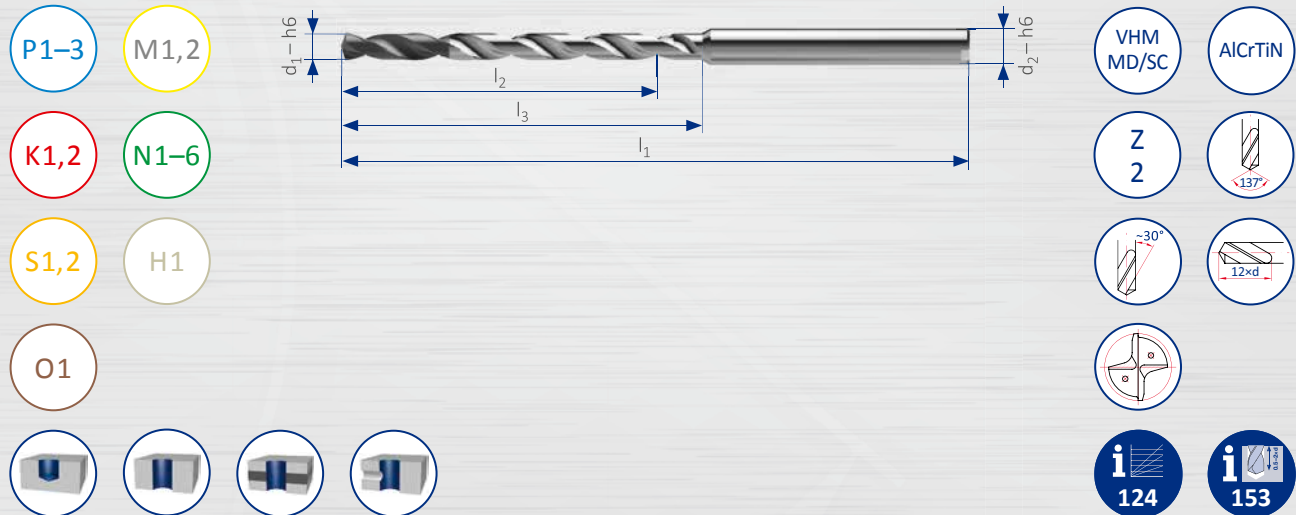
Art. 52909



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.00	9.00	11.00	51	3.00	4.80	43.20	51.00	91	6.00
1.10	9.90	12.00	51	3.00	4.90	44.10	52.00	91	6.00
1.20	10.80	13.00	51	3.00	5.00	45.00	53.00	91	6.00
1.30	11.70	14.00	51	3.00	5.10	45.90	54.00	100	6.00
1.40	12.60	15.00	51	3.00	5.20	46.80	55.00	100	6.00
1.50	13.50	16.50	51	3.00	5.30	47.70	56.00	100	6.00
1.60	14.40	17.50	51	3.00	5.40	48.60	57.00	100	6.00
1.70	15.30	18.50	51	3.00	5.50	49.50	57.50	100	6.00
1.80	16.20	19.00	51	3.00	5.60	50.40	58.50	100	6.00
1.90	17.10	20.00	51	3.00	5.70	51.30	59.50	100	6.00
2.00	18.00	21.00	51	3.00	5.80	52.20	60.00	100	6.00
2.10	18.90	22.00	61	3.00	5.90	53.10	61.00	100	6.00
2.20	19.80	23.00	61	3.00	6.00	54.00	62.00	100	6.00
2.30	20.70	24.00	61	3.00	6.10	54.90	64.00	111	8.00
2.40	21.60	24.50	61	3.00	6.20	55.80	65.00	111	8.00
2.50	22.50	25.50	61	3.00	6.30	56.70	66.00	111	8.00
2.60	23.40	26.50	61	3.00	6.40	57.60	66.50	111	8.00
2.70	24.30	27.50	61	3.00	6.50	58.50	67.50	111	8.00
2.80	25.20	28.00	61	3.00	6.60	59.40	68.50	111	8.00
2.90	26.10	29.00	61	3.00	6.70	60.30	69.50	111	8.00
3.00	27.00	31.00	61	3.00	6.80	61.20	70.00	111	8.00
3.10	27.90	32.00	79	6.00	6.90	62.10	71.00	111	8.00
3.20	28.80	33.00	79	6.00	7.00	63.00	73.00	111	8.00
3.30	29.70	34.00	79	6.00	7.10	63.90	74.00	120	8.00
3.40	30.60	35.00	79	6.00	7.20	64.80	75.00	120	8.00
3.50	31.50	36.50	79	6.00	7.30	65.70	76.00	120	8.00
3.60	32.40	37.50	79	6.00	7.40	66.60	76.50	120	8.00
3.70	33.30	38.50	79	6.00	7.50	67.50	77.50	120	8.00
3.80	34.20	39.00	79	6.00	7.60	68.40	78.50	120	8.00
3.90	35.10	40.00	79	6.00	7.70	69.30	79.50	120	8.00
4.00	36.00	41.00	79	6.00	7.80	70.20	80.00	120	8.00
4.10	36.90	43.00	91	6.00	7.90	71.00	81.00	120	8.00
4.20	37.80	44.00	91	6.00	8.00	72.00	82.00	120	8.00
4.30	38.70	45.00	91	6.00	8.50	76.50	87.50	134	10.00
4.40	39.60	45.50	91	6.00	9.00	81.00	92.00	134	10.00
4.50	40.50	46.50	91	6.00	9.50	85.50	96.50	144	10.00
4.60	41.40	49.50	91	6.00	10.00	90.00	102.00	144	10.00
4.70	42.30	50.50	91	6.00					

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

Art. 52912



d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.00	12.00	14.00	50	3.00	4.80	57.60	65.50	105	6.00
1.10	13.20	15.50	50	3.00	4.90	58.80	67.00	105	6.00
1.20	14.40	16.50	50	3.00	5.00	60.00	68.00	105	6.00
1.30	15.60	17.50	50	3.00	5.10	61.20	69.50	118	6.00
1.40	16.80	19.00	50	3.00	5.20	62.40	70.50	118	6.00
1.50	18.00	21.00	50	3.00	5.30	63.60	71.50	118	6.00
1.60	19.20	22.50	50	3.00	5.40	64.80	73.00	118	6.00
1.70	20.40	23.50	50	3.00	5.50	66.00	74.00	118	6.00
1.80	21.60	24.50	50	3.00	5.60	67.20	75.50	118	6.00
1.90	22.80	26.00	55	3.00	5.70	68.40	76.50	118	6.00
2.00	24.00	27.00	55	3.00	5.80	69.60	77.50	118	6.00
2.10	25.20	28.50	55	3.00	5.90	70.80	79.00	118	6.00
2.20	26.40	29.50	55	3.00	6.00	72.00	80.00	118	6.00
2.30	27.60	30.50	55	3.00	6.10	73.20	82.50	136	8.00
2.40	28.80	32.00	55	3.00	6.20	74.40	83.50	136	8.00
2.50	30.00	33.00	60	3.00	6.30	75.60	84.50	136	8.00
2.60	31.20	34.50	60	3.00	6.40	76.80	86.00	136	8.00
2.70	32.40	35.50	60	3.00	6.50	78.00	87.50	136	8.00
2.80	33.60	36.50	60	3.00	6.60	79.20	88.50	136	8.00
2.90	34.80	38.00	60	3.00	6.70	80.40	89.50	136	8.00
3.00	36.00	40.00	60	3.00	6.80	81.60	90.50	136	8.00
3.10	37.20	41.50	80	6.00	6.90	82.80	92.00	136	8.00
3.20	38.40	42.50	80	6.00	7.00	84.00	94.00	136	8.00
3.30	39.60	43.50	80	6.00	7.10	85.20	95.50	148	8.00
3.40	40.80	45.00	85	6.00	7.20	86.40	96.50	148	8.00
3.50	42.00	47.00	85	6.00	7.30	87.60	97.50	148	8.00
3.60	43.20	48.50	85	6.00	7.40	88.80	99.00	148	8.00
3.70	44.40	49.50	90	6.00	7.50	90.00	100.00	148	8.00
3.80	45.60	50.50	90	6.00	7.60	91.20	101.50	148	8.00
3.90	46.80	52.00	90	6.00	7.70	92.40	102.50	148	8.00
4.00	48.00	53.00	90	6.00	7.80	93.60	103.50	148	8.00
4.10	49.20	55.50	105	6.00	7.90	94.80	105.00	148	8.00
4.20	50.40	56.50	105	6.00	8.00	96.00	106.00	148	8.00
4.30	51.60	57.50	105	6.00	8.50	102.00	113.00	162	10.00
4.40	52.80	59.00	105	6.00	9.00	108.00	119.00	162	10.00
4.50	54.00	60.00	105	6.00	9.50	114.00	125.00	175	10.00
4.60	55.20	63.50	105	6.00	10.00	120.00	132.00	175	10.00
4.70	56.40	64.50	105	6.00					

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

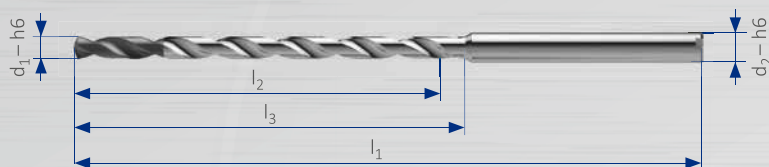
Art. 52916

P1-3 M1,2

K1,2 N1-6

S1,2 H1

O1



VHM
MD/SC

AlCrTiN

Z
2



i
124

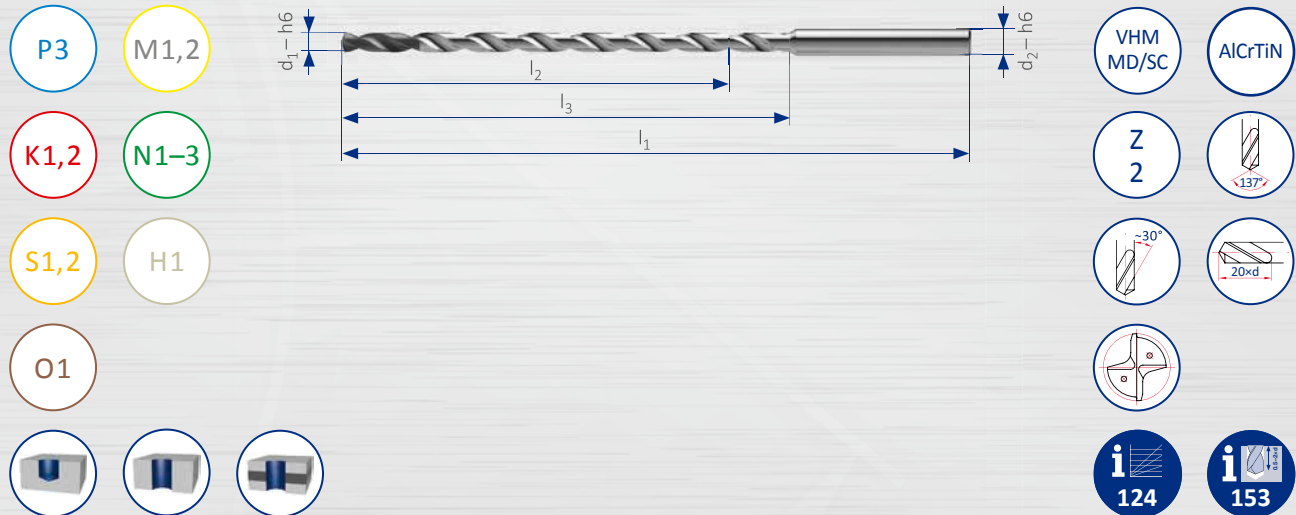
i
153

d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm
4.80	76.80	85.00	126	6.00
4.90	78.40	86.50	126	6.00
5.00	80.00	88.00	126	6.00
5.10	81.60	89.50	142	6.00
5.20	83.20	91.00	142	6.00
5.30	84.80	93.00	142	6.00
5.40	86.40	94.50	142	6.00
5.50	88.00	96.00	142	6.00
5.60	89.60	97.50	142	6.00
5.70	91.20	99.00	142	6.00
5.80	92.80	101.00	142	6.00
5.90	94.40	102.50	142	6.00
6.00	96.00	104.00	142	6.00
6.10	97.60	106.50	160	8.00
6.20	99.20	108.00	160	8.00
6.30	100.80	110.00	160	8.00
6.40	102.40	111.50	160	8.00
6.50	104.00	113.00	160	8.00
6.60	105.60	114.50	160	8.00
6.70	107.20	116.00	160	8.00
6.80	108.80	118.00	160	8.00
6.90	110.40	119.50	160	8.00
7.00	112.00	122.00	160	8.00
7.10	113.60	123.50	176	8.00
7.20	115.20	125.00	176	8.00
7.30	116.80	127.00	176	8.00
7.40	118.40	128.50	176	8.00
7.50	120.00	130.00	176	8.00
7.60	121.60	131.50	176	8.00
7.70	123.20	133.00	176	8.00
7.80	124.80	135.00	176	8.00
7.90	126.40	136.50	176	8.00
8.00	128.00	138.00	176	8.00
8.50	136.00	147.00	197	10.00
9.00	144.00	155.00	197	10.00
9.50	152.00	163.00	214	10.00
10.00	160.00	172.00	214	10.00

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

Art. 52920



d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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

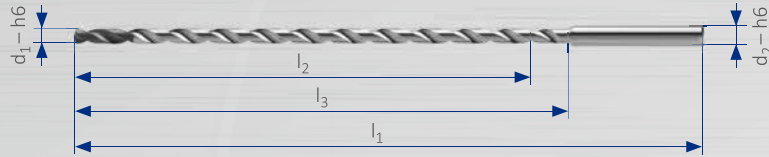
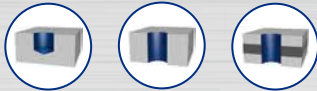
Art. 52930

P3 M1,2

K1,2 N1-3

S1,2 H1

O1



VHM
MD/SC

AlCrTiN

Z
2



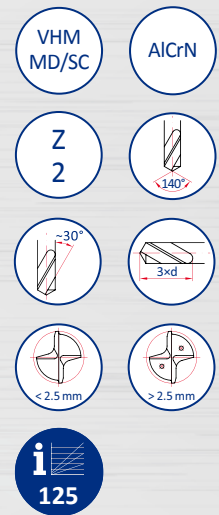
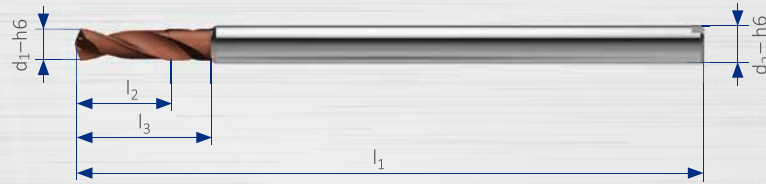
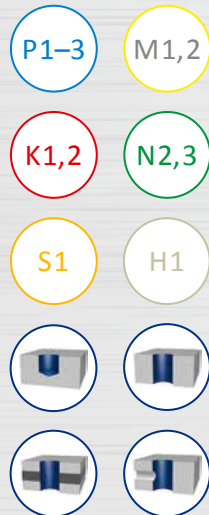
i
124

i
153

d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm
3.00	90.00	99.00	138	6.00
3.30	99.00	108.00	146	6.00
4.00	120.00	134.00	172	6.00
4.20	126.00	140.00	178	6.00
5.00	150.00	167.00	205	6.00
6.00	180.00	198.00	236	6.00
6.80	204.00	224.00	264	8.00
7.00	210.00	231.00	271	8.00
8.00	240.00	262.00	302	8.00
8.50	255.00	280.00	325	10.00
9.00	270.00	297.00	342	10.00
10.00	285.00	300.00	345	10.00

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

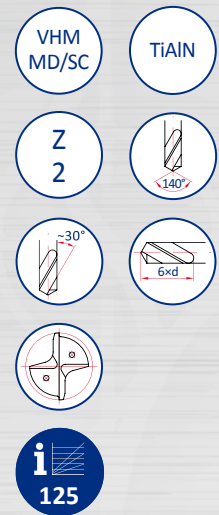
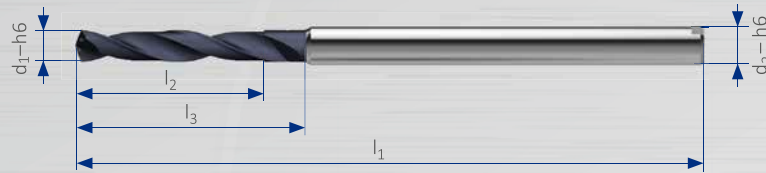
Art. 50938



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

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

Art. 50940



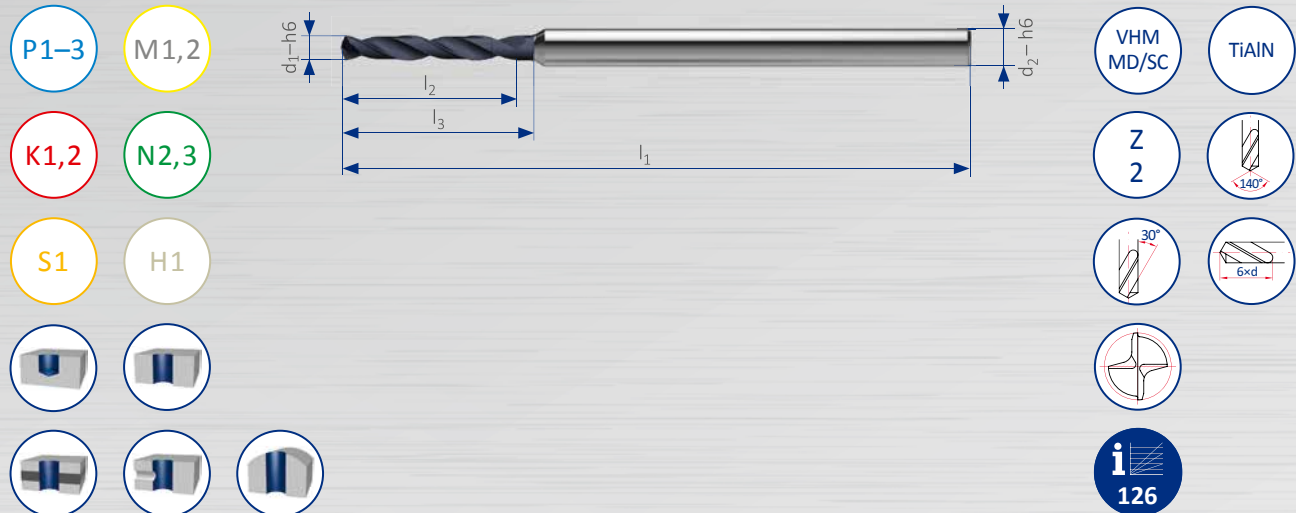
d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm
1.00	6.00	8.00	38	3.00	2.90	17.40	20.40	50	3.00	4.80	28.80	37.00	79	6.00	7.40	44.40	54.50	95	8.00
1.05	6.30	8.30	38	3.00	2.95	17.70	20.70	50	3.00	4.85	29.10	37.50	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



d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	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

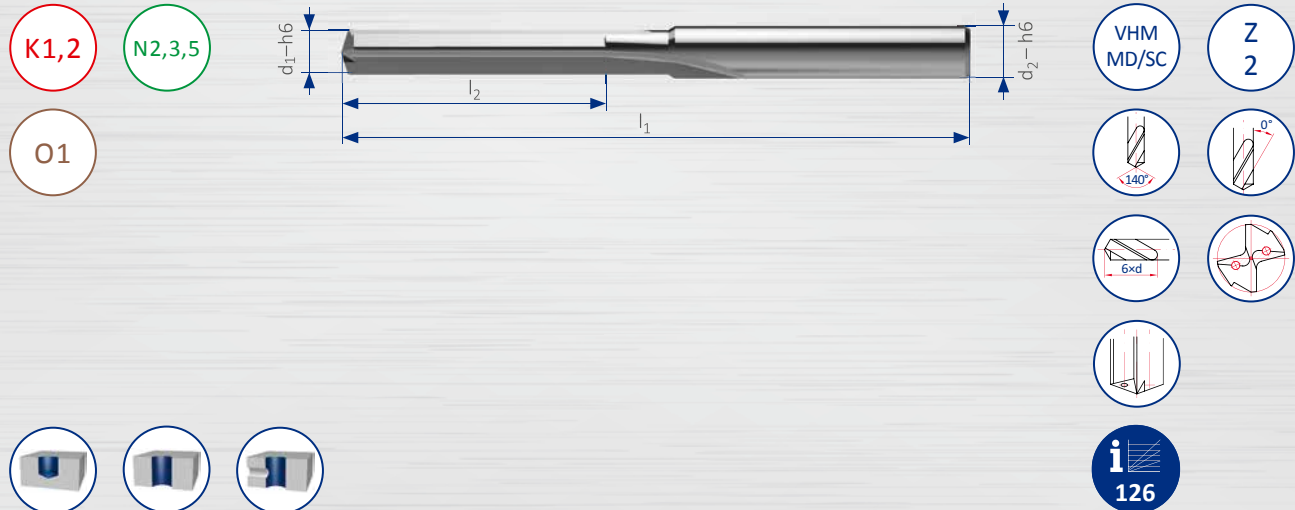
Art. 50941



d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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

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

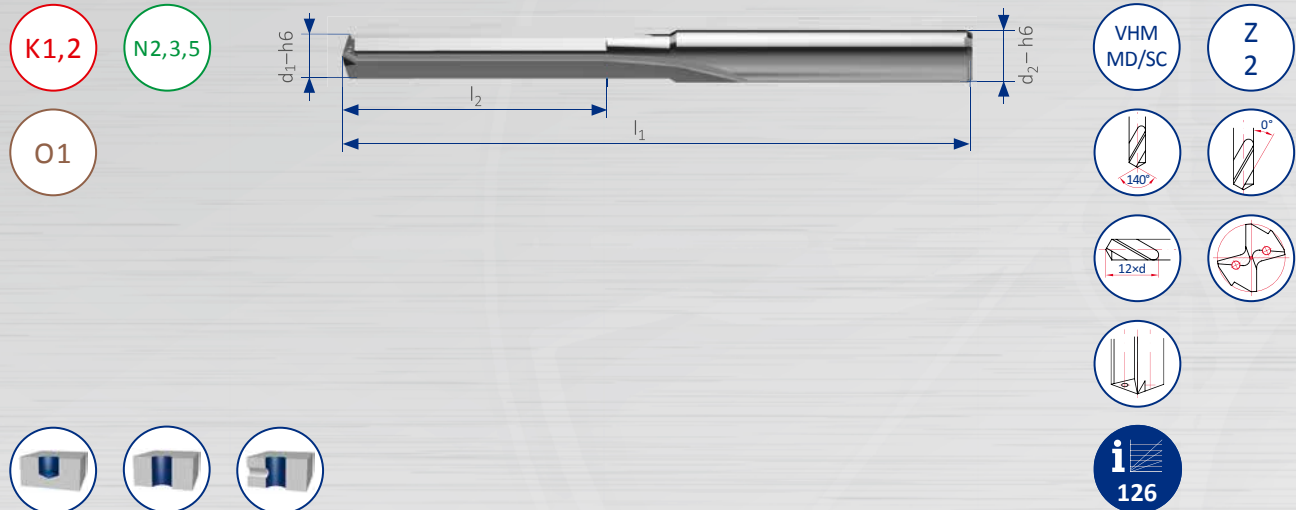
Art. 52100



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



d_1 mm	l_2 mm	l_1 mm	d_2 mm	d_1 mm	l_2 mm	l_1 mm	d_2 mm
3.00	36.00	106	6.00	17.00	204.00	300	18.00
3.20	39.00	106	6.00	17.50	210.00	300	18.00
3.30	40.00	106	6.00	18.00	216.00	300	18.00
3.50	42.00	106	6.00	18.50	222.00	327	20.00
4.00	48.00	106	6.00	19.00	228.00	327	20.00
4.20	51.00	118	6.00	19.50	234.00	327	20.00
4.50	54.00	118	6.00	20.00	240.00	327	20.00
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				

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

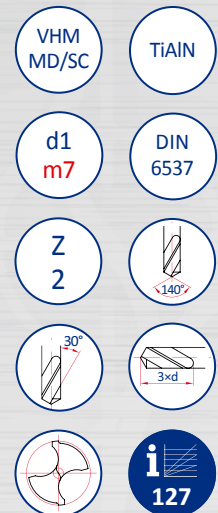
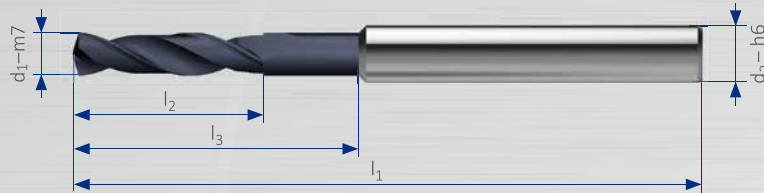
Art. 52150



d ₁	l ₂	l ₁	d ₂
mm	mm	mm	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 elicoidal Fastcut
Twist drill Fastcut

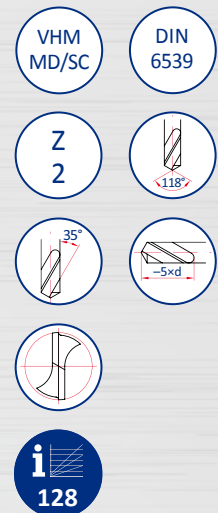
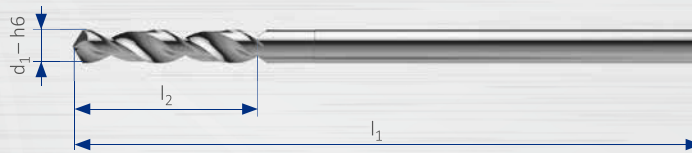
Art. 50950



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

Spiralbohrer Posicut
Foret hélicoïdal Posicut
Punta elicoidal Posicut
Twist drill Posicut

Art. 50830



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			

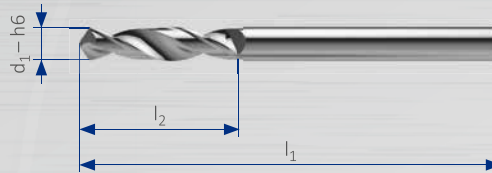
Spiralbohrer Spirec
Foret hélicoïdal Spirec
Punta elicoidal Spirec
Twist drill Spirec

Art. 50838

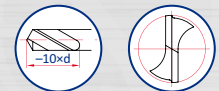
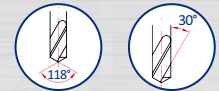
P1-3 M1,2

K1,2 N1-6

S1 O1



VHM MD/SC Z 2



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 elicoidal Spicut
Twist drill Spicut

Art. 50820

P1,2

K1,2

N2,3,5



VHM
MD/SC

DIN
338

Z
2



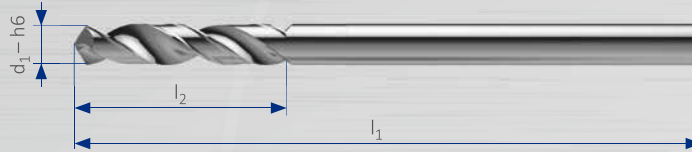
i
129



d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm	d_1 mm	l_2 mm	l_1 mm
0.70	8	28	4.50	45	80	8.30	73	117
0.80	9	30	4.60	45	80	8.40	73	117
0.90	10	32	4.70	45	80	8.50	73	117
1.00	11	34	4.80	50	86	8.60	78	125
1.10	13	36	4.90	50	86	8.70	78	125
1.20	15	38	5.00	50	86	8.80	78	125
1.30	15	38	5.10	50	86	8.90	78	125
1.40	17	40	5.20	50	86	9.00	78	125
1.50	17	40	5.30	50	86	9.10	78	125
1.60	19	43	5.40	55	93	9.20	78	125
1.70	19	43	5.50	55	93	9.30	78	125
1.80	21	46	5.60	55	93	9.40	78	125
1.90	21	46	5.70	55	93	9.50	78	125
2.00	23	49	5.80	55	93	9.60	84	133
2.10	23	49	5.90	55	93	9.70	84	133
2.20	26	53	6.00	55	93	9.80	84	133
2.30	26	53	6.10	61	101	9.90	84	133
2.40	29	57	6.20	61	101	10.00	84	133
2.50	29	57	6.30	61	101	10.20	84	133
2.60	29	57	6.40	61	101	10.50	84	133
2.70	31	61	6.50	61	101	11.00	91	142
2.80	31	61	6.60	61	101	11.50	91	142
2.90	31	61	6.70	61	101	12.00	98	151
3.00	31	61	6.80	67	109	12.50	98	151
3.10	34	65	6.90	67	109	13.00	98	151
3.20	34	65	7.00	67	109	13.50	105	160
3.30	34	65	7.10	67	109	14.00	105	160
3.40	37	70	7.20	67	109			
3.50	37	70	7.30	67	109			
3.60	37	70	7.40	67	109			
3.70	37	70	7.50	67	109			
3.80	41	75	7.60	73	117			
3.90	41	75	7.70	73	117			
4.00	41	75	7.80	73	117			
4.10	41	75	7.90	73	117			
4.20	41	75	8.00	73	117			
4.30	45	80	8.10	73	117			
4.40	45	80	8.20	73	117			

Bohrreibahle Asycut
Foret alésoir Asycut
Punta alesatore Asycut
Drill reamer Asycut

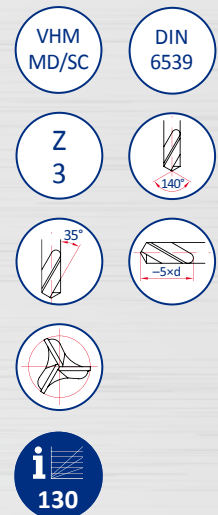
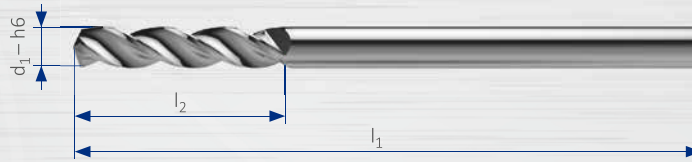
Art. 50840



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
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			
3.50	19.50	52	7.30	33.00	74			
3.60	19.50	52	7.40	33.00	74			
3.70	19.50	52	7.50	33.00	74			
3.80	21.50	55	7.60	36.00	79			
3.90	21.50	55	7.70	36.00	79			
4.00	21.50	55	7.80	36.00	79			
4.10	21.50	55	7.90	36.00	79			
4.20	21.50	55	8.00	36.00	79			
4.30	23.00	58	8.10	36.00	79			
4.40	23.00	58	8.20	36.00	79			
4.50	23.00	58	8.30	36.00	79			
4.60	23.00	58	8.40	36.00	79			
4.70	23.00	58	8.50	36.00	79			
4.80	25.00	62	8.60	39.00	84			
4.90	25.00	62	8.70	39.00	84			
5.00	25.00	62	8.80	39.00	84			
5.10	25.00	62	8.90	39.00	84			
5.20	25.00	62	9.00	39.00	84			
5.30	25.00	62	9.10	39.00	84			
5.40	27.00	66	9.20	39.00	84			
5.50	27.00	66	9.30	39.00	84			
5.60	27.00	66	9.40	39.00	84			
5.70	27.00	66	9.50	39.00	84			

Bohrreibahle Tricut
Foret alésoir Tricut
Punta alesatore Tricut
Drill reamer Tricut

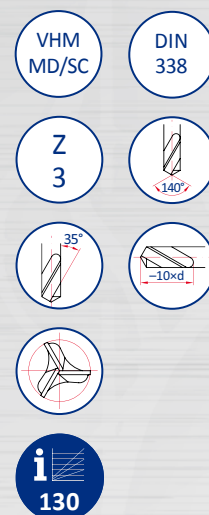
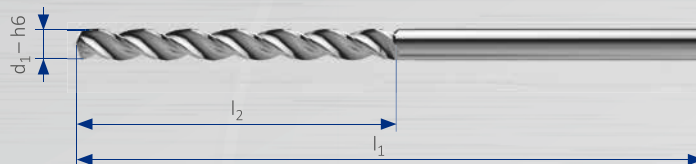
Art. 55654



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	6.0	26	4.60	22.5	58	7.938	5/16"	34.0	79
1.10	6.5	28	4.70	22.5	58	8.00		34.0	79
1.20	7.5	30	4.763	3/16"	24.5	8.10		34.0	79
1.30	7.5	30	4.80		24.5	8.20		34.0	79
1.40	8.5	32	4.90		24.5	8.30		34.0	79
1.50	8.5	32	5.00		24.5	8.40		34.0	79
1.60	9.5	34	5.10		24.5	8.50		34.0	79
1.70	9.5	34	5.20		24.5	8.60		36.5	84
1.80	10.5	36	5.30		24.5	8.70		36.5	84
1.90	10.5	36	5.40		26.0	8.80		36.5	84
2.00	11.5	38	5.50		26.0	8.90		36.5	84
2.10	11.5	38	5.556	7/32"	26.0	9.00		36.5	84
2.20	12.5	40	5.60		26.0	9.10		36.5	84
2.30	12.5	40	5.70		26.0	9.20		36.5	84
2.40	13.5	43	5.80		26.0	9.30		36.5	84
2.50	13.5	43	5.90		26.0	9.40		36.5	84
2.60	13.5	43	6.00		26.0	9.50		36.5	84
2.70	15.5	46	6.10		28.5	9.525	3/8"	39.0	89
2.80	15.5	46	6.20		28.5	9.60		39.0	89
2.90	15.5	46	6.30		28.5	9.70		39.0	89
3.00	15.5	46	6.350	1/4"	28.5	9.80		39.0	89
3.10	17.0	49	6.40		28.5	9.90		39.0	89
3.175	1/8"	17.0	6.50		28.5	10.00		39.0	89
3.20	17.0	49	6.60		28.5	10.20		39.0	89
3.30	17.0	49	6.70		28.5	10.50		39.0	89
3.40	19.0	52	6.80		31.0	11.00		43.0	95
3.50	19.0	52	6.90		31.0	11.113	7/16"	43.0	95
3.60	19.0	52	7.00		31.0	11.50		43.0	95
3.70	19.0	52	7.10		31.0	12.00		47.0	102
3.80	21.0	55	7.144	9/32"	31.0	12.50		47.0	102
3.90	21.0	55	7.20		31.0	12.700	1/2"	47.0	102
3.969	5/32"	21.0	7.30		31.0	13.00		47.0	102
4.00	21.0	55	7.40		31.0	13.50		50.0	107
4.10	21.0	55	7.50		31.0	14.00		50.0	107
4.20	21.0	55	7.60		34.0				
4.30	22.5	58	7.70		34.0				
4.40	22.5	58	7.80		34.0				
4.50	22.5	58	7.90		34.0				

Bohrreibahle Tricut
Foret alésoir Tricut
Punta alesatore Tricut
Drill reamer Tricut

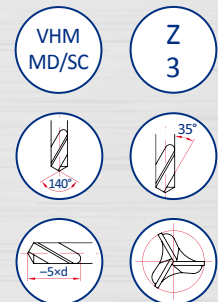
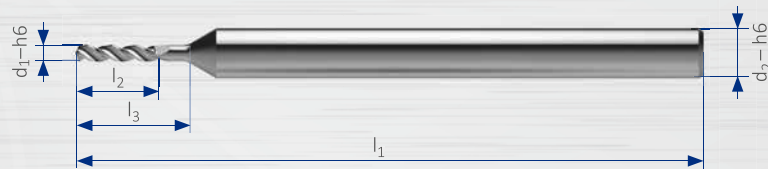
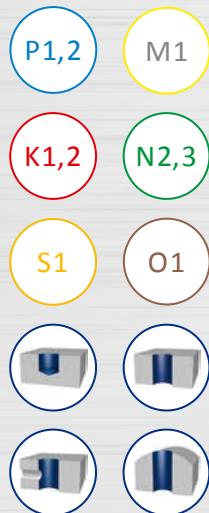
Art. 55338



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

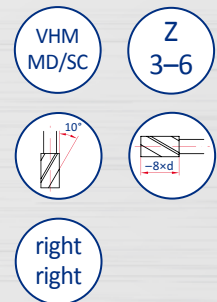
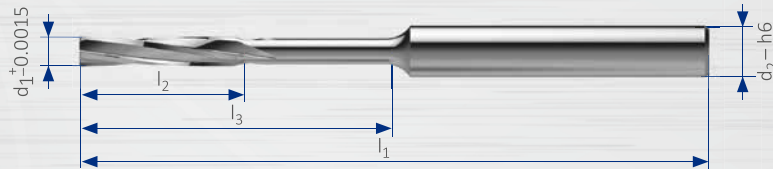


d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂	d ₁	l ₂	l ₃	l ₁	d ₂
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.20	1.00	1.50	38	3.00	0.58	2.90	3.40	38	3.00	0.96	4.80	5.30	38	3.00	1.34	6.70	9.50	38	3.00
0.21	1.05	1.50	38	3.00	0.59	2.95	3.40	38	3.00	0.97	4.85	5.30	38	3.00	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



	ø	d ₁	l ₂	l ₃	l ₁	d ₂	z
		mm	mm	mm	mm	mm	
	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	l ₂	l ₃	l ₁	d ₂	z
		mm	mm	mm	mm	mm	
	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**

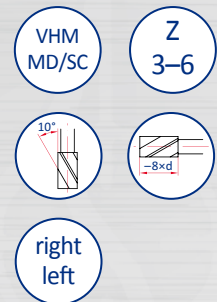
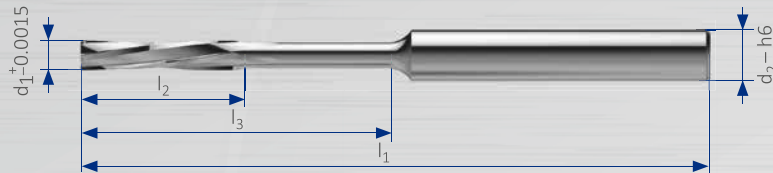
**Diamètre intermédiaire
sur demande**

**Diametri intermediari
su richiesta**

**Diameter intermediate
on request**

Reibahle
Alésoir
Alesatore
Reamer

Art. 58500



ϕ	d_1	l_2	l_3	l_1	d_2	z
mm	mm	mm	mm	mm	mm	
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

ϕ	d_1	l_2	l_3	l_1	d_2	z
mm	mm	mm	mm	mm	mm	
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**



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 × $\varnothing$		30°	2	
	72150	0.10–2.00	0.10	1.5 × $\varnothing$		30°	2	
	42000	0.10–3.00	0.05	3 × $\varnothing$		30°	2	
	72500	0.30–2.50	0.10	5 × $\varnothing$		30°	2	
	72800	0.40–2.50	0.10	8 × $\varnothing$		30°	2	
	73130	0.30–3.00	0.10	1.3 × $\varnothing$		30°	3	
	73200	0.30–2.90	0.10	2 × $\varnothing$		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			
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

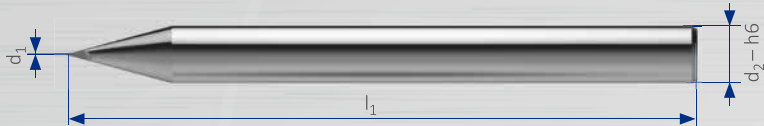
- ✓ hervorragend/excellent/ottimamente/outstanding
- geeignet/approprié/adatto/suitable

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
- 30°
- 0°
- ↓
- ↺

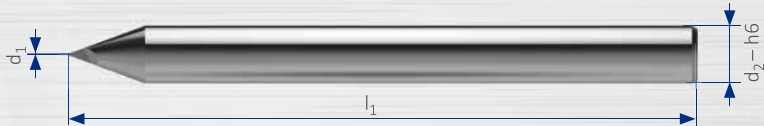


d ₁ mm	α °	l ₁ mm	d ₂ mm
0.02	30	33	3.00
0.03	30	33	3.00
0.04	30	33	3.00
0.05	30	33	3.00
0.06	30	33	3.00
0.07	30	33	3.00
0.08	30	33	3.00
0.09	30	33	3.00
0.10	30	33	3.00
0.12	30	33	3.00
0.15	30	33	3.00

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
- 40°
- 0°
- ↓
- ↺

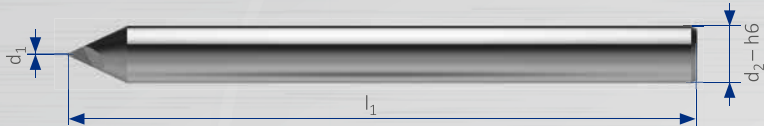


d ₁ mm	α °	l ₁ mm	d ₂ mm
0.02	40	33	3.00
0.03	40	33	3.00
0.04	40	33	3.00
0.05	40	33	3.00
0.06	40	33	3.00
0.07	40	33	3.00
0.08	40	33	3.00
0.09	40	33	3.00
0.10	40	33	3.00
0.12	40	33	3.00
0.15	40	33	3.00

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
- 50°
- 0°
- ↓
- ↺

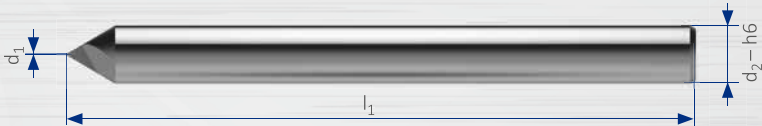


d ₁ mm	α °	l ₁ mm	d ₂ mm
0.02	50	33	3.00
0.03	50	33	3.00
0.04	50	33	3.00
0.05	50	33	3.00
0.06	50	33	3.00
0.07	50	33	3.00
0.08	50	33	3.00
0.09	50	33	3.00
0.10	50	33	3.00
0.12	50	33	3.00
0.15	50	33	3.00

Gravierfräser
 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
- 60°
- 0°
- ↓
- ↺

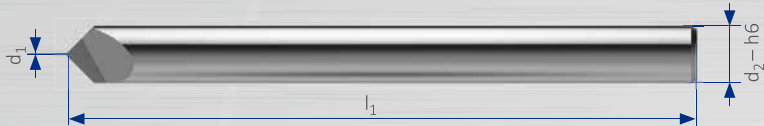


d_1 mm	α °	l_1 mm	d_2 mm
0.02	60	33	3.00
0.03	60	33	3.00
0.04	60	33	3.00
0.05	60	33	3.00
0.06	60	33	3.00
0.07	60	33	3.00
0.08	60	33	3.00
0.09	60	33	3.00
0.10	60	33	3.00
0.12	60	33	3.00
0.15	60	33	3.00

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
- 90°
- 0°
- ↓
- ↻

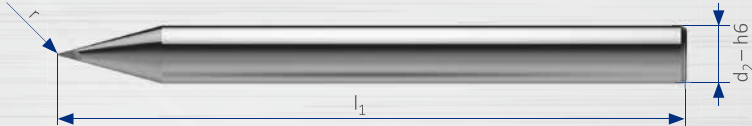


d ₁ mm	α °	l ₁ mm	d ₂ mm
0.02	90	33	3.00
0.03	90	33	3.00
0.04	90	33	3.00
0.05	90	33	3.00
0.06	90	33	3.00
0.07	90	33	3.00
0.08	90	33	3.00
0.09	90	33	3.00
0.10	90	33	3.00
0.12	90	33	3.00
0.15	90	33	3.00

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
- 30°
- 0°
- ↓
- ↺

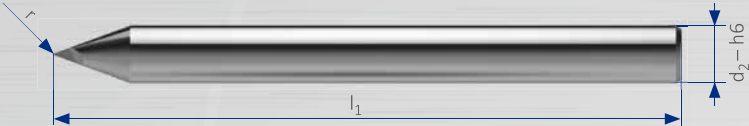


r	α	l ₁	d ₂
mm	°	mm	mm
0.04	30	33	3.00
0.05	30	33	3.00
0.06	30	33	3.00
0.07	30	33	3.00
0.08	30	33	3.00
0.09	30	33	3.00
0.10	30	33	3.00

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
- 40°
- 0°
-
-

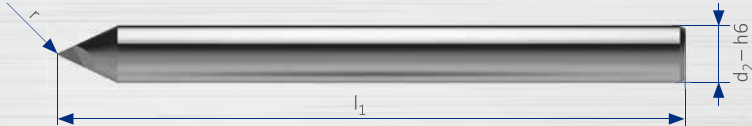


r	α	l ₁	d ₂
mm	°	mm	mm
0.04	40	33	3.00
0.05	40	33	3.00
0.06	40	33	3.00
0.07	40	33	3.00
0.08	40	33	3.00
0.09	40	33	3.00
0.10	40	33	3.00

Gravierfräser
 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
- 50°
- 0°
- ↓
- ↺

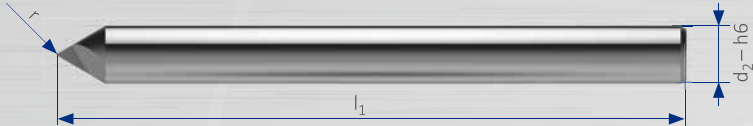


r	α	l ₁	d ₂
mm	°	mm	mm
0.04	50	33	3.00
0.05	50	33	3.00
0.06	50	33	3.00
0.07	50	33	3.00
0.08	50	33	3.00
0.09	50	33	3.00
0.10	50	33	3.00

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
- 60°
- 0°
-
-
-
-

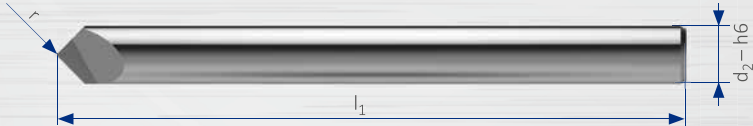


r	α	l ₁	d ₂
mm	°	mm	mm
0.04	60	33	3.00
0.05	60	33	3.00
0.06	60	33	3.00
0.07	60	33	3.00
0.08	60	33	3.00
0.09	60	33	3.00
0.10	60	33	3.00

Gravierfräser
 Fraise à graver
 Fresa per incidere
 Engraving mill

Art. 70190

- P1-3
- M1,2
- K1,2
- N1-8
- S1
- O1



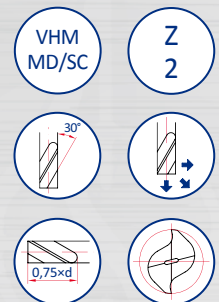
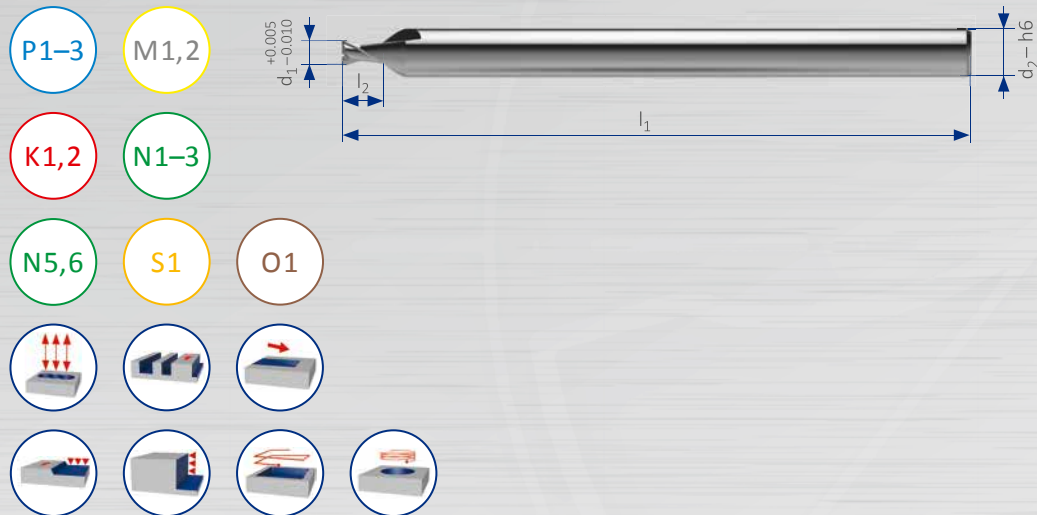
- VHM
MD/SC
- Z
1
- 90°
- 0°
- ↓
- ↺



r	α	l ₁	d ₂
mm	°	mm	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



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
0.20	0.15	39	3.00
0.30	0.25	39	3.00
0.40	0.30	39	3.00
0.50	0.37	39	3.00
0.60	0.45	39	3.00
0.70	0.53	39	3.00
0.80	0.60	39	3.00
0.90	0.70	39	3.00
1.00	0.75	39	3.00
1.10	0.90	39	3.00
1.20	0.90	39	3.00
1.30	1.00	39	3.00
1.40	1.10	39	3.00
1.50	1.15	39	3.00
1.60	1.20	39	3.00
1.70	1.30	39	3.00
1.80	1.40	39	3.00
1.90	1.45	39	3.00
2.00	1.50	39	3.00

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

Art. 72150

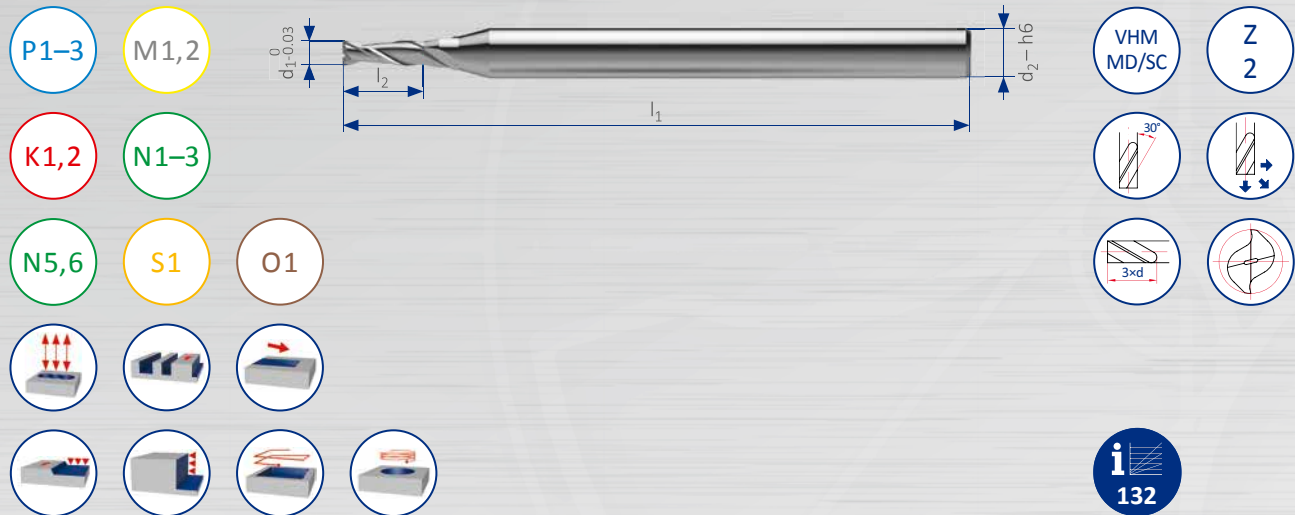


d_1 mm	l_2 mm	l_1 mm	d_2 mm
0.10	0.15	39	3.00
0.15	0.20	39	3.00
0.20	0.30	39	3.00
0.25	0.35	39	3.00
0.30	0.45	39	3.00
0.40	0.60	39	3.00
0.50	0.75	39	3.00
0.60	0.90	39	3.00
0.70	1.05	39	3.00
0.80	1.20	39	3.00
0.90	1.35	39	3.00
1.00	1.50	39	3.00
1.10	1.65	39	3.00
1.20	1.80	39	3.00
1.30	1.95	39	3.00
1.40	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

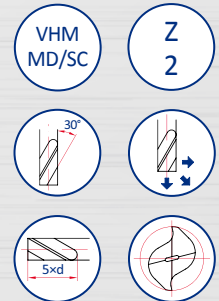
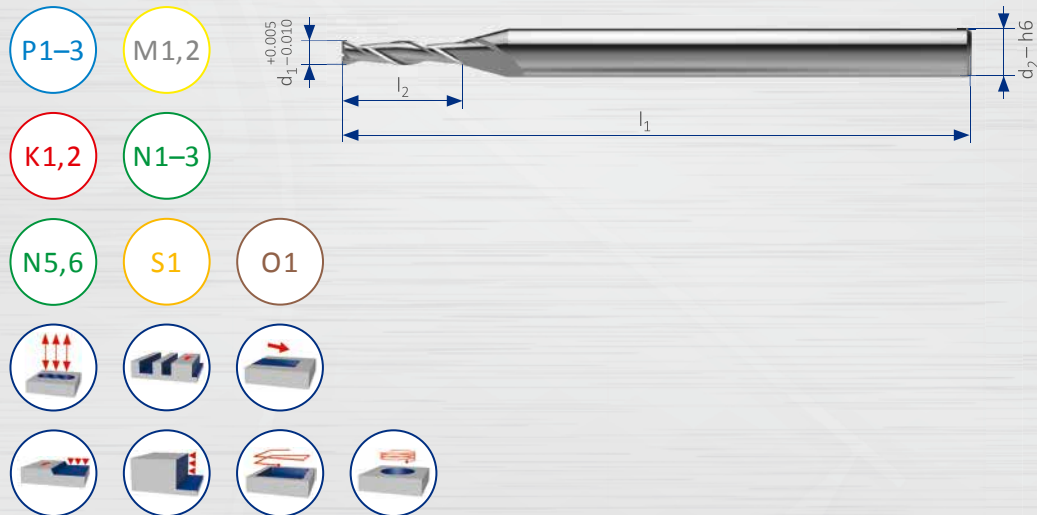
Art. 42000



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
0.10	0.30	38	3.00	2.00	6.00	38	3.00
0.15	0.45	38	3.00	2.10	6.30	38	3.00
0.20	0.60	38	3.00	2.20	6.60	38	3.00
0.25	0.75	38	3.00	2.30	6.90	38	3.00
0.30	0.90	38	3.00	2.40	7.20	38	3.00
0.35	1.05	38	3.00	2.50	7.50	38	3.00
0.40	1.10	38	3.00	2.60	7.80	38	3.00
0.45	1.35	38	3.00	2.70	8.10	38	3.00
0.50	1.50	38	3.00	2.80	8.40	38	3.00
0.55	1.65	38	3.00	2.90	8.70	38	3.00
0.60	1.70	38	3.00	3.00	9.00	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				

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

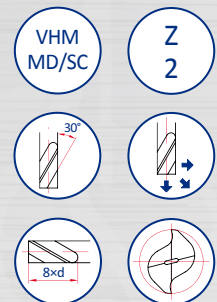
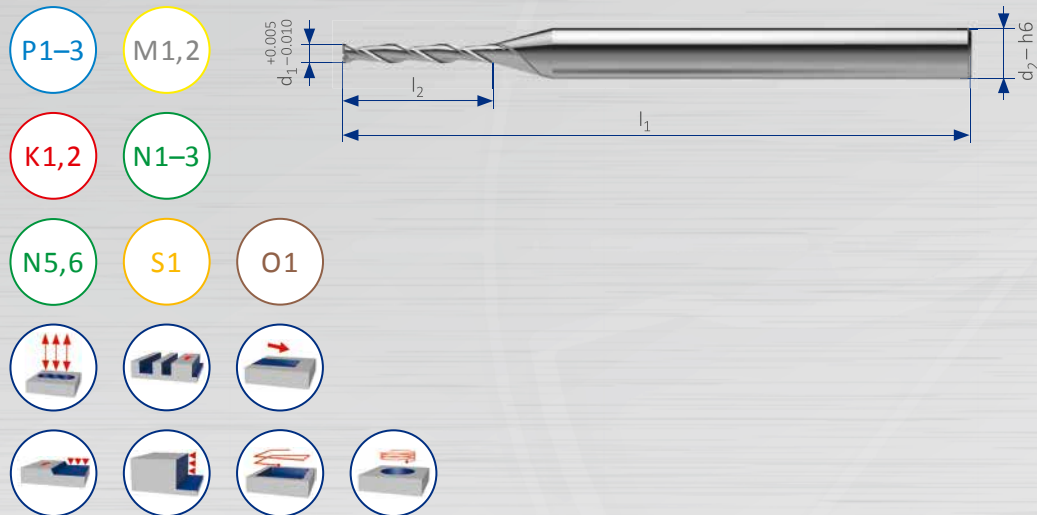
Art. 72500



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



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

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

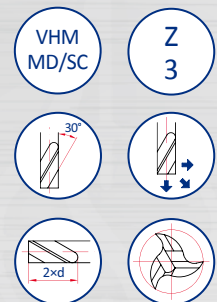
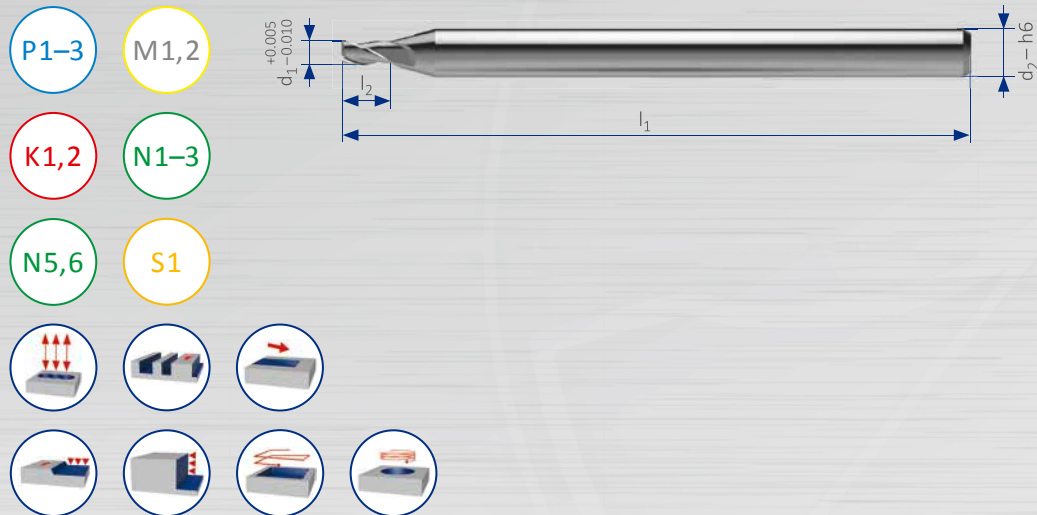
Art. 73130



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



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
0.30	0.60	39	3.00
0.40	0.80	39	3.00
0.50	1.00	39	3.00
0.60	1.20	39	3.00
0.70	1.40	39	3.00
0.75	1.50	39	3.00
0.80	1.60	39	3.00
0.90	1.80	39	3.00
1.00	2.00	39	3.00
1.10	2.20	39	3.00
1.20	2.40	39	3.00
1.30	2.60	39	3.00
1.40	2.80	39	3.00
1.50	3.00	39	3.00
1.60	3.20	39	3.00
1.70	3.40	39	3.00
1.80	3.60	39	3.00
1.90	3.80	39	3.00
2.00	4.00	39	3.00
2.10	4.20	39	3.00
2.20	4.40	39	3.00
2.30	4.60	39	3.00
2.40	4.80	39	3.00
2.50	5.00	39	3.00
2.60	5.20	39	3.00
2.70	5.40	39	3.00
2.80	5.60	39	3.00
2.90	5.80	39	3.00

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

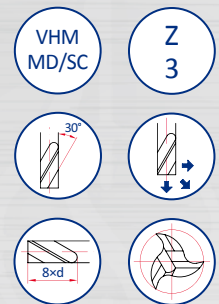
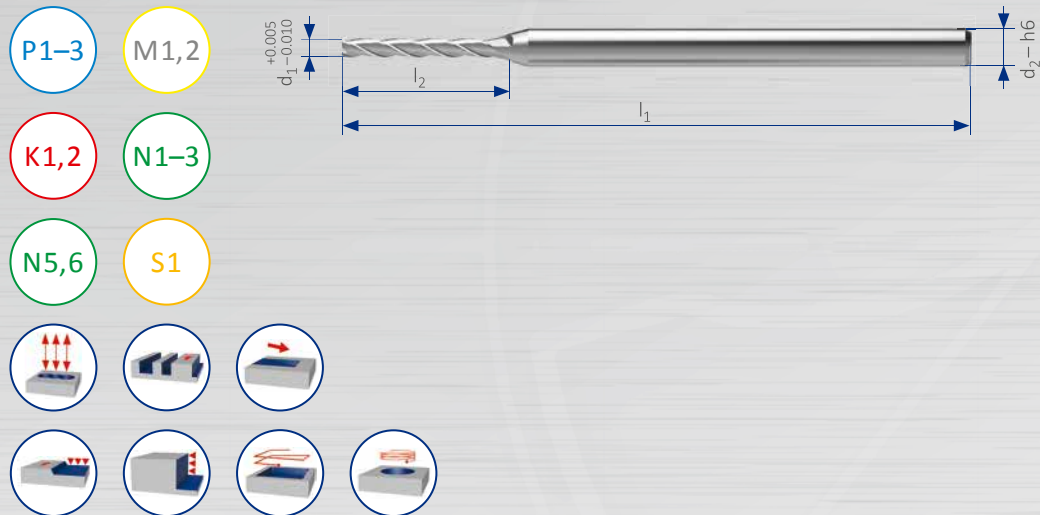
Art. 73300



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



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

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

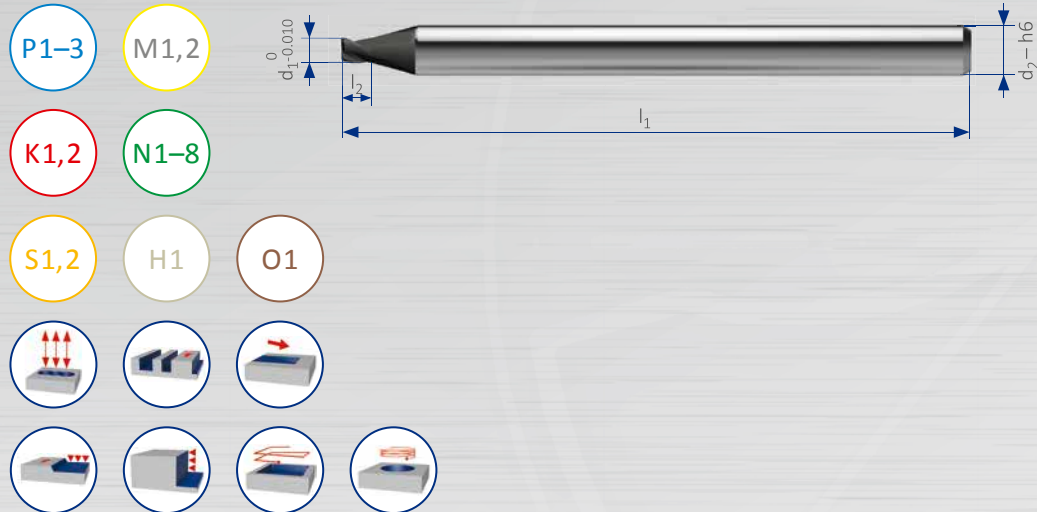
Art. 73725



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

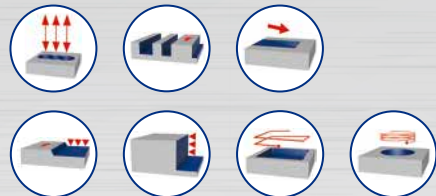
Art. 43105



P1-3 M1,2

K1,2 N1-8

S1,2 H1 O1



VHM MD/SC Cro-Nova

Z 3 35°

1x d

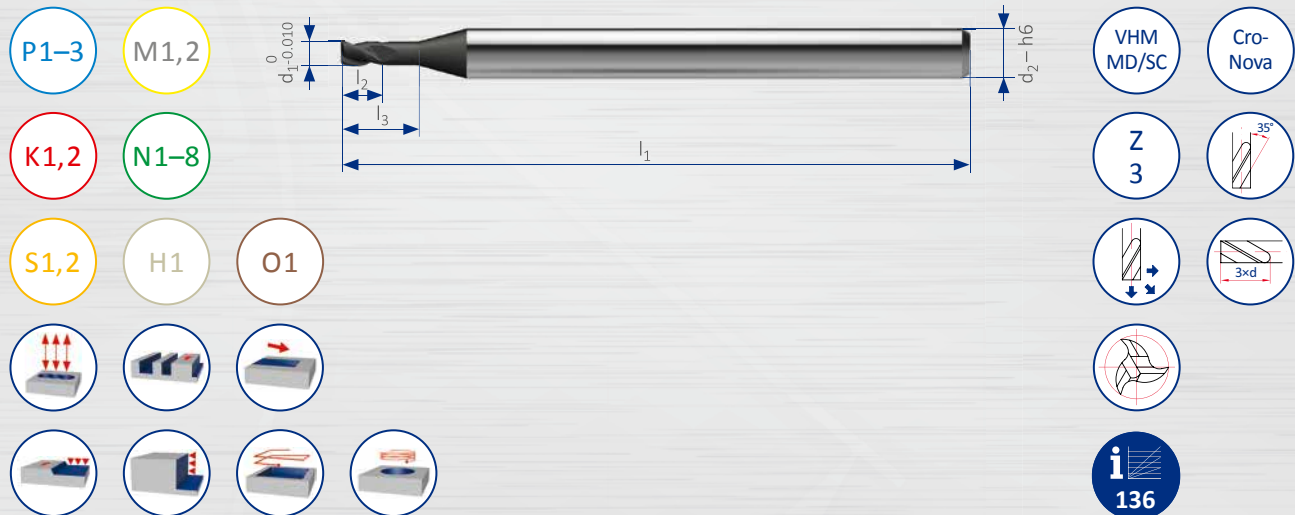


i 135

d ₁	l ₂	l ₁	d ₂
mm	mm	mm	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

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

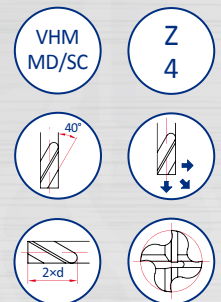
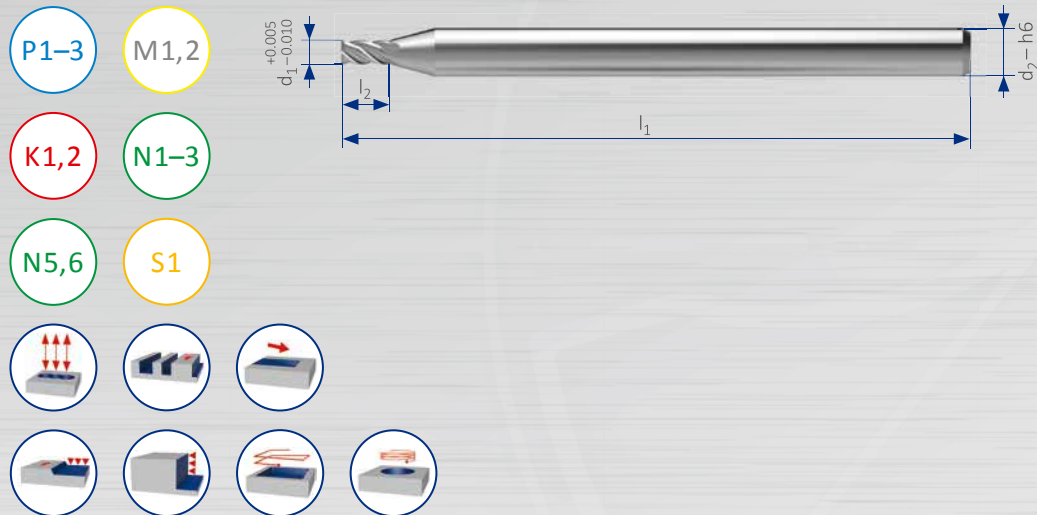
Art. 43305



d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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



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

Mikrofräser
Micro fraise
Micro fresa
Micro endmill

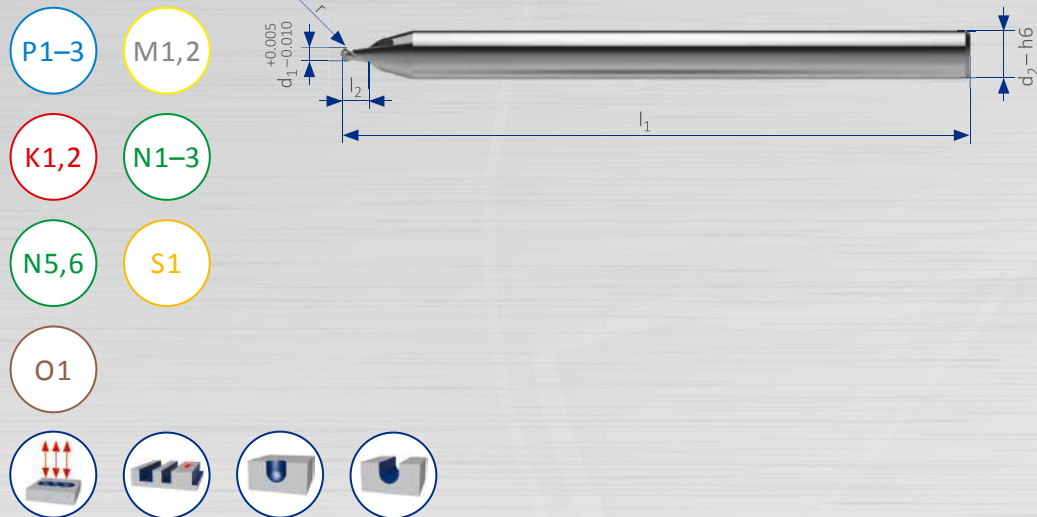
Art. 74740



d ₁	l ₂	l ₁	d ₂
mm	mm	mm	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 radio
Ball nose Endmill

Art. 74075



d_1	r	l_2	l_1	d_2
mm	mm	mm	mm	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

Radiusfräser
Fraise hémisphérique
Fresa a radio
Ball nose Endmill

Art. 74150



d_1	r	l_2	l_1	d_2
mm	mm	mm	mm	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 radio
Ball nose Endmill

Art. 74300

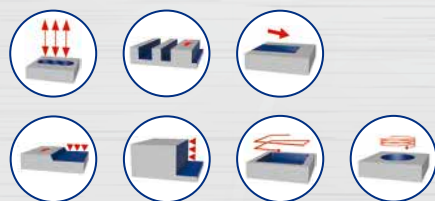
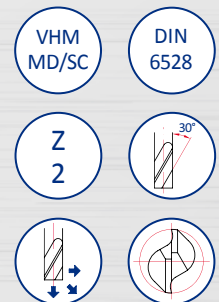
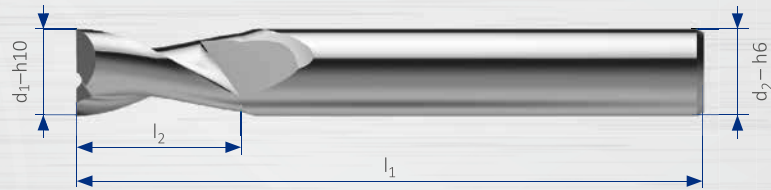


d_1	r	l_2	l_1	d_2
mm	mm	mm	mm	mm
0.20	0.10	0.60	39	3.00
0.30	0.15	1.00	39	3.00
0.40	0.20	1.00	39	3.00
0.50	0.25	1.50	39	3.00
0.60	0.30	1.50	39	3.00
0.70	0.35	2.00	39	3.00
0.80	0.40	2.00	39	3.00
0.90	0.45	2.50	39	3.00
1.00	0.50	3.00	39	3.00
1.20	0.60	4.00	39	3.00
1.40	0.70	4.00	39	3.00
1.50	0.75	4.00	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



Fräser
Fraise
Fresa
Endmill

Art. 40000



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

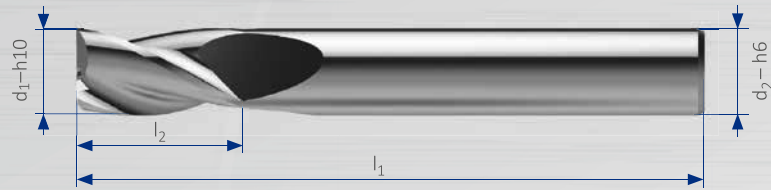
Fräser
Fraise
Fresa
Endmill

Art. 40002

P1-3

M1

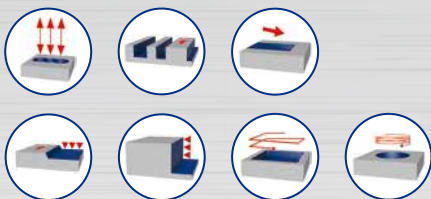
K1,2



VHM
MD/SC

DIN
6528

Z
3

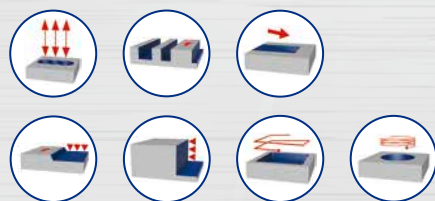
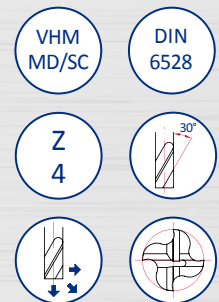
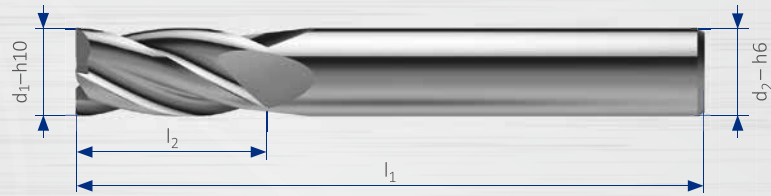


i
138

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. 40004



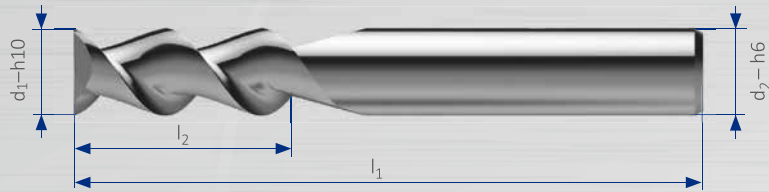
d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
2.00	10.00	50	2.00
2.50	10.00	50	2.50
3.00	10.00	50	3.00
3.50	10.00	50	3.50
4.00	11.00	50	4.00
4.50	11.00	50	4.50
5.00	13.00	50	5.00
6.00	13.00	57	6.00
8.00	19.00	63	8.00
10.00	22.00	72	10.00
12.00	26.00	83	12.00

Fräser AC2
Fraise AC2
Fresa AC2
Endmill AC2

Art. 47000

N1-3

O1



VHM
MD/SC

Z
2

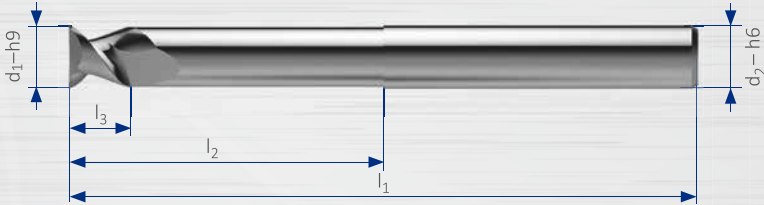


d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
3.00	12.00	50	3.00
4.00	15.00	50	4.00
5.00	20.00	50	5.00
6.00	20.00	57	6.00
8.00	20.00	63	8.00
10.00	25.00	72	10.00
12.00	25.00	83	12.00
14.00	30.00	90	14.00
16.00	30.00	92	16.00
20.00	38.00	104	20.00

Fräser ACL2
 Fraise ACL2
 Fresa ACL2
 Endmill ACL2

Art. 47500

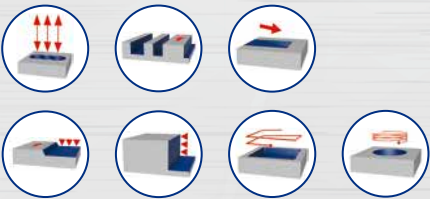
N1-3
 O1



VHM MD/SC

Z 2

55°

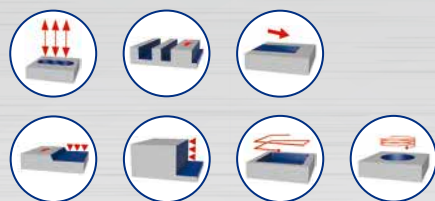
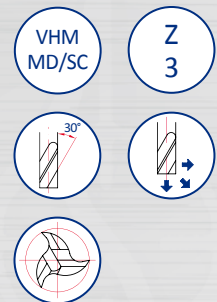
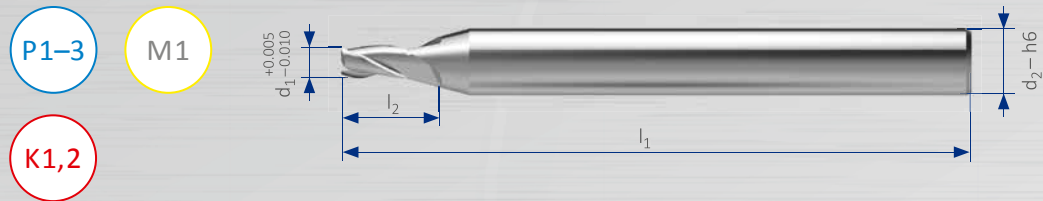


i
 139

d_1	l_2	l_3	l_1	d_2
mm	mm	mm	mm	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

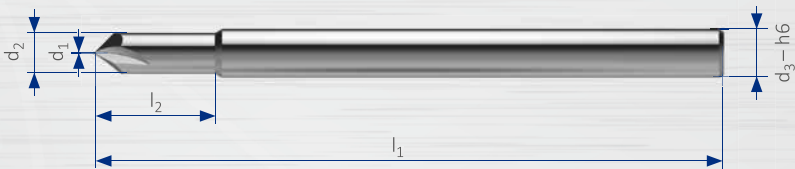


d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm
1.50	6.00	57	6.00
2.00	6.00	57	6.00
2.50	6.00	57	6.00
3.00	7.00	57	6.00
3.50	7.00	57	6.00
4.00	8.00	57	6.00
4.50	8.00	57	6.00
5.00	10.00	57	6.00
5.50	10.00	57	6.00
6.00	10.00	57	6.00

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°
-



d_1	d_2	l_2	l_1	d_3	z
mm	mm	mm	mm	mm	
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

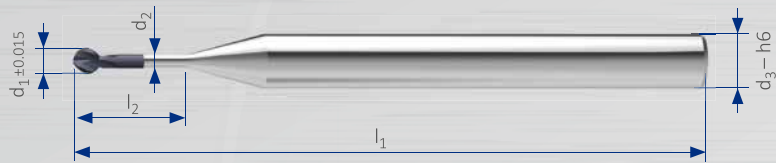
N1-8

S1,2

H1,2

O1





VHM MD/SC

AlTiCrN+S

Z 3







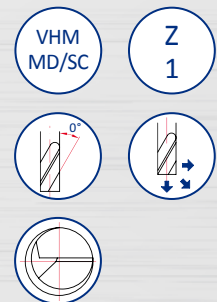
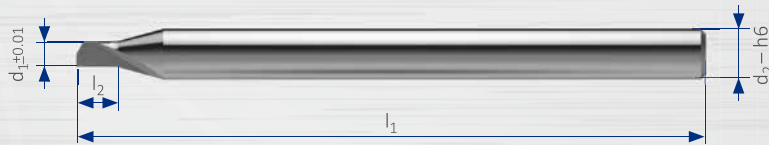
i

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

Einzahnfräser
Fraise 1 dent
Fresa 1 dente
Endmill 1 tooth

Art. 71330



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

Applicazione della tecnologia

Application technology

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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
Parametri di lavoro
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			

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Schnittdaten
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Art. 50810 / 50812 / 50814 / 50818

Mat.		ø 3.00–6.00	ø 6.00–12.00	ø 12.00–20.00
P1	Vc	25–40	25–40	25–40
	f	0.120–0.250	0.250–0.300	0.300–0.400
P2	Vc	20–35	20–35	20–35
	f	0.100–0.200	0.200–0.250	0.250–0.300
P3	Vc	10–30	10–30	10–30
	f	0.008–0.150	0.150–0.220	0.220–0.300
M1	Vc	10–20	10–20	10–20
	f	0.050–0.150	0.150–0.200	0.200–0.250
M2	Vc	8–16	8–16	8–16
	f	0.040–0.080	0.080–0.140	0.140–0.200
K1	Vc	25–40	25–40	25–40
	f	0.070–0.150	0.150–0.200	0.200–0.350
K2	Vc	20–35	20–35	20–35
	f	0.050–0.100	0.100–0.150	0.150–0.250
N1	Vc	45–60	45–60	45–60
	f	0.100–0.250	0.250–0.350	0.350–0.400
N2	Vc	30–45	30–45	30–45
	f	0.150–0.300	0.300–0.400	0.400–0.600
N3	Vc	25–40	25–40	25–40
	f	0.100–0.250	0.250–0.350	0.350–0.550
N4	Vc	25–40	25–40	25–40
	f	0.060–0.150	0.150–0.250	0.250–0.400
N5	Vc	45–60	45–60	45–60
	f	0.100–0.250	0.250–0.350	0.350–0.450
N6	Vc	25–40	25–40	25–40
	f	0.060–0.100	0.100–0.150	0.150–0.250
N7	Vc	25–40	25–40	25–40
	f	0.050–0.150	0.150–0.250	0.250–0.350
N8	Vc	12–30	12–30	12–30
	f	0.030–0.100	0.100–0.150	0.150–0.200
S1	Vc	30–45	30–45	30–45
	f	0.040–0.150	0.150–0.200	0.200–0.300
S2	Vc			
	f			
H1	Vc			
	f			
H2	Vc			
	f			
H3	Vc			
	f			
O1	Vc	30–45	30–45	30–45
	f	0.100–0.250	0.250–0.400	0.400–0.800
O2	Vc			
	f			
O3	Vc			
	f			

Art. 50811 / 50813 / 50815

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

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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					

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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					

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. 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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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. 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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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. 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
Données de coupe
Parametri di lavoro
Cutting data

Art. 50938

Mat.		ø 1.00–2.40	ø 2.50–5.00	ø 5.10–8.00	ø 8.10–12.70
P1	V _c	50–80	60–100	60–100	60–100
	f	0.030–0.070	0.045–0.120	0.110–0.150	0.150–0.200
P2	V _c	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c				
	f				
N2	V _c	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	V _c	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	V _c				
	f				
N5	V _c				
	f				
N6	V _c				
	f				
N7	V _c				
	f				
N8	V _c				
	f				
S1	V _c	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	V _c				
	f				
H1	V _c	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	V _c				
	f				
H3	V _c				
	f				
O1	V _c				
	f				
O2	V _c				
	f				
O3	V _c				
	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c	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	V _c				
	f				
N2	V _c	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	V _c	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	V _c				
	f				
N5	V _c				
	f				
N6	V _c				
	f				
N7	V _c				
	f				
N8	V _c				
	f				
S1	V _c	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	V _c				
	f				
H1	V _c	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	V _c				
	f				
H3	V _c				
	f				
O1	V _c				
	f				
O2	V _c				
	f				
O3	V _c				
	f				

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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

Art. 50941

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

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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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

Données de coupe

Parametri di lavoro

Cutting data

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	0.048–0.100	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

Données de coupe

Parametri di lavoro

Cutting data

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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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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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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. 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 f 0.050–0.100	20–30 0.080–0.130	20–30 0.120–0.180	20–30 0.170–0.230	20–30 0.220–0.280
P2	Vc 15–25 f 0.040–0.080	15–25 0.070–0.120	15–25 0.110–0.170	15–25 0.160–0.220	15–25 0.210–0.260
P3	Vc 10–20 f 0.035–0.070	10–20 0.060–0.100	10–20 0.090–0.150	10–20 0.130–0.180	10–20 0.170–0.200
M1	Vc 10–20 f 0.040–0.080	10–20 0.070–0.120	10–20 0.110–0.170	10–20 0.160–0.220	10–20 0.200–0.260
M2	Vc 10–15 f 0.035–0.070	10–15 0.060–0.100	10–15 0.090–0.150	10–15 0.130–0.180	10–15 0.170–0.200
K1	Vc 20–30 f 0.050–0.100	20–30 0.080–0.150	20–30 0.140–0.220	20–30 0.200–0.260	20–30 0.030–0.280
K2	Vc 15–25 f 0.050–0.090	15–25 0.075–0.140	15–25 0.130–0.200	15–25 0.180–0.240	15–25 0.200–0.260
N1	Vc f				
N2	Vc 30–40 f 0.060–0.120	30–40 0.110–0.160	30–40 0.150–0.220	30–40 0.200–0.260	30–40 0.240–0.300
N3	Vc 25–35 f 0.060–0.120	25–35 0.110–0.160	25–35 0.150–0.220	25–35 0.200–0.260	25–35 0.240–0.300
N4	Vc 15–25 f 0.035–0.070	15–25 0.060–0.100	15–25 0.090–0.150	15–25 0.130–0.180	15–25 0.170–0.200
N5	Vc 30–40 f 0.035–0.070	30–40 0.060–0.100	30–40 0.090–0.150	30–40 0.130–0.180	30–40 0.170–0.200
N6	Vc f				
N7	Vc f				
N8	Vc f				
S1	Vc 10–15 f 0.035–0.070	10–15 0.060–0.100	10–15 0.090–0.150	10–15 0.130–0.180	10–15 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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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 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	0.001–0.003	0.002–0.015	0.012–0.030	0.4 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	0.001–0.006	0.005–0.025	0.020–0.045	1 x d1	1 x 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	0.015–0.035	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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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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 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	0.015–0.035	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					

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	0.015–0.035	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					

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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	0.015–0.035	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	0.015–0.035	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.

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. 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					

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. 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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					

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. 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 x d1	1 x d1
N1	V _c	70–100	70–100	70–100		
	f _z	0.003–0.01	0.006–0.020	0.015–0.035	0.8 x d1	1 x 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 x d1	1 x 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 x d1	1 x 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 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	0.45 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	0.002–0.008	0.006–0.015	0.012–0.030	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	80–120	80–120	80–120		
	f _z	0.005–0.012	0.010–0.025	0.020–0.045	0.9 x d1	1 x d1
O2	V _c					
	f _z					
O3	V _c					
	f _z					

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Les valeurs mentionnées sont des valeurs recommandées qui doivent être adaptées selon les conditions de la machine, du serrage, du lubrifiant etc.

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

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				

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

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Schnittdaten
Données de coupe
Parametri di lavoro
Cutting data

Art. 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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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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 f _z 0.010–0.020	60–80 0.020–0.040	60–80 0.040–0.060	1 × d1	1 × d1
P2	V _c 50–70 f _z 0.010–0.020	50–70 0.020–0.040	50–70 0.040–0.060	0.6 × d1	1 × d1
P3	V _c 40–60 f _z 0.008–0.015	40–60 0.015–0.035	40–60 0.035–0.050	0.5 × d1	1 × d1
M1	V _c 40–60 f _z 0.008–0.015	40–60 0.015–0.035	40–60 0.035–0.050	0.5 × d1	1 × d1
M2	V _c f _z				
K1	V _c 60–80 f _z 0.010–0.020	60–80 0.020–0.040	60–80 0.040–0.060	1 × d1	1 × d1
K2	V _c 50–70 f _z 0.010–0.020	50–70 0.020–0.040	50–70 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 f _z 0.004–0.015	70–120 0.015–0.030	70–120 0.050–0.120
P2	V _c 60–100 f _z 0.003–0.013	60–100 0.013–0.025	60–100 0.045–0.100
P3	V _c 40–80 f _z 0.002–0.012	40–80 0.012–0.023	40–80 0.040–0.090
M1	V _c 40–80 f _z 0.002–0.012	40–80 0.008–0.020	40–80 0.030–0.080
M2	V _c 30–70 f _z 0.001–0.010	30–70 0.010–0.016	30–70 0.025–0.070
K1	V _c 120–150 f _z 0.004–0.015	100–150 0.015–0.030	100–150 0.050–0.120
K2	V _c 100–130 f _z 0.003–0.013	100–130 0.013–0.025	100–130 0.045–0.100
N1	V _c 150–200 f _z 0.005–0.018	150–200 0.018–0.035	150–200 0.060–0.150
N2	V _c 150–200 f _z 0.005–0.018	150–200 0.018–0.035	150–200 0.060–0.150
N3	V _c 150–200 f _z 0.004–0.015	150–200 0.015–0.030	150–200 0.050–0.120
N4	V _c 150–200 f _z 0.005–0.018	150–200 0.018–0.035	150–200 0.060–0.150
N5	V _c 150–200 f _z 0.005–0.018	150–200 0.018–0.035	150–200 0.060–0.150
N6	V _c f _z		
N7	V _c 80–120 f _z 0.005–0.018	80–120 0.018–0.035	80–120 0.060–0.150
N8	V _c 80–120 f _z 0.005–0.018	80–120 0.018–0.035	80–120 0.060–0.150
S1	V _c 40–70 f _z 0.002–0.012	40–70 0.012–0.023	40–70 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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Schnittdaten

Données de coupe

Parametri di lavoro

Cutting data

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					

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Anwendungen

Application

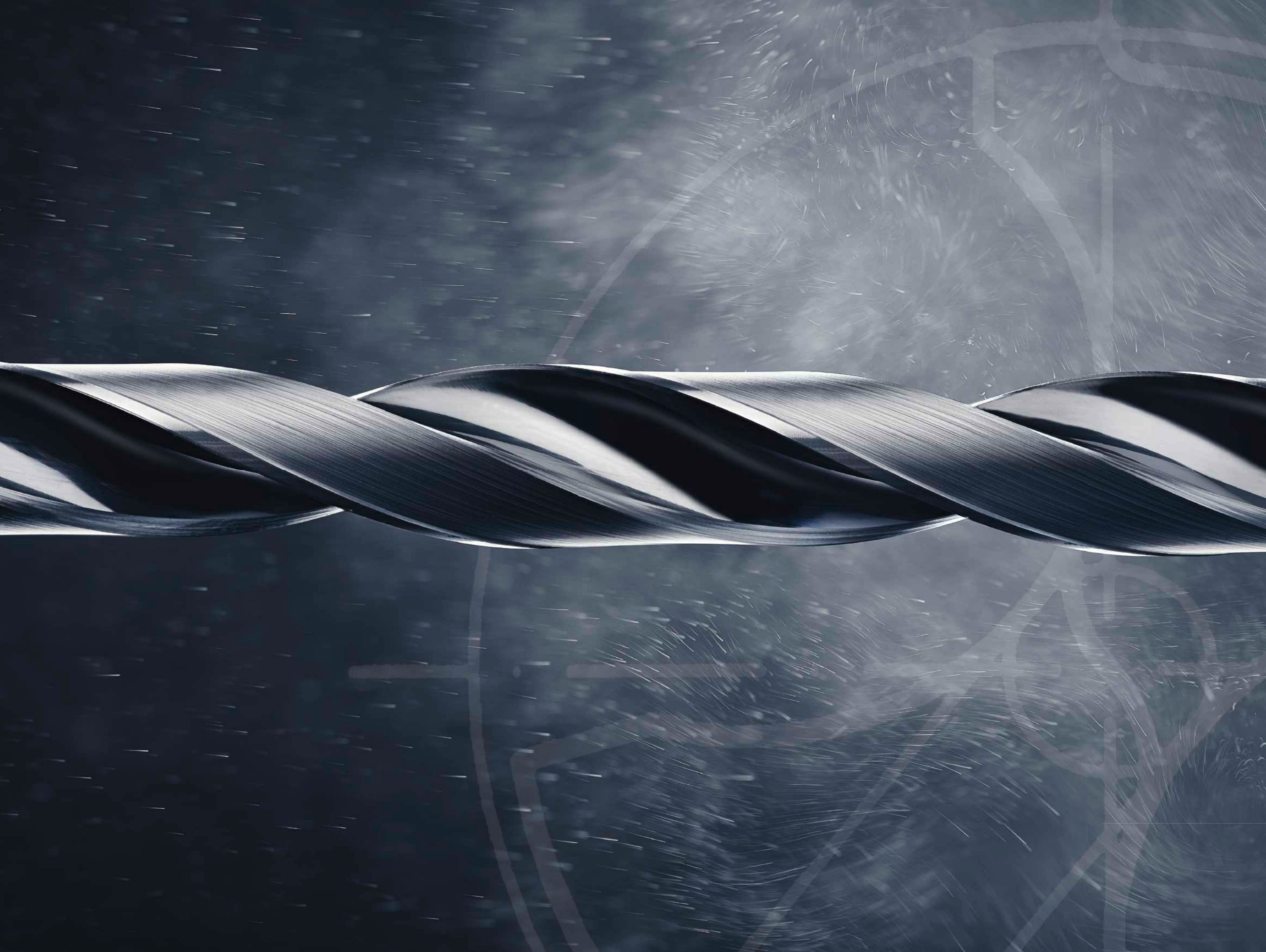
Applicazioni

Applications

	Sackloch Trou borgne	Foro cieco Blind hole		Senkung 130° Centrage / Chanfrein 130°	Angolo 130° Countersink 130°
	Sackloch mit Senkung Trou borgne avec chanfrein	Foro cieco con smusso Blind hole with coun- tersink		Senkung 140° Centrage / Chanfrein 140°	Angolo 140° Countersink 140°
	Stufenbohrung Trou étagé	Foro a gradino Step hole		Senkung 90°–140° Double angle 90°–140°	Angolo 90°–140° Double angle counter- sink 90°–140°
	Durchgangsbohrung Trou traversant	Foro passante Through hole		Kantenbruch 60° Chanfrein 60°	Smusso 60° Chamfer 60°
	Durchgang mit Senkung Trou traversant avec chanfrein	Foro con smusso Through hole with countersink		Kantenbruch 90° Chanfrein 90°	Smusso 90° Chamfer 90°
	Mehrere Schichten Perçage multiple	Multistrato Multi-composite material		Kantenbruch 120° Chanfrein 120°	Smusso 120° Chamfer 120°
	Querbohrung Perçage latéral	Foro trasversale Cross hole		Innen- und Aussenkan- tenbruch / Chanfrein intérieur et extérieur	Smusso interno ed esterno / Internal and external chamfer
	In Rundung Surface arrondie	Superficie a raggio Round surface		Einstecken Plongée	Entrata a tuffo Plunge
	In Schräge Surface inclinée	Superficie inclinata Inclined surface		Nuten normal Transversal	Fresatura normale Straight groove milling
	Gravierstichel flach Graveur avec plat	Bulino piatto Graver for groove, flat bottom		Nuten schräg Fraisage angulaire	Fresatura inclinata Angular groove milling
	Gravierstichel rund Graveur avec rayon	Bulino a raggio Graver for groove, full bottom radius		Schlichten Stirnseite Fraisage de finition latéral et frontal	Finitura frontale Front side finishing
	Radius einstecken Rayon en plongée	Raggio a tuffo Plunge radius		Schlichten mit Umfang Fraisage de finition latéral	Finitura laterale Side finishing
	Radius längs Fraise de rayon longitudinal	Raggio longitudinale Straight radius		Schruppen Stirnseite Fraisage ébauche	Sgrossatura frontale Front side roughing
	Senkung 60° Centrage / Chanfrein 60°	Angolo 60° Countersink 60°		Zyklisch eckig Fraisage de poche	Fresatura angolare Angular milling
	Senkung 90° Centrage / Chanfrein 90°	Angolo 90° Countersink 90°		Zyklisch rund Fraisage circulaire	Fresatura circolare Circular milling
	Senkung 120° Centrage / Chanfrein 120°	Angolo 120° Countersink 120°			

Werkstoffgruppen
Groupe des matériaux
Gruppi di materiali
Workpiece materials

Festigkeit (N / mm²), Härte Force (N / mm²), durezza		Resistenza (N / mm²), durezza Strength (N / mm²), hardness	Beispiel Exemple	Esempio 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, perllitisch 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

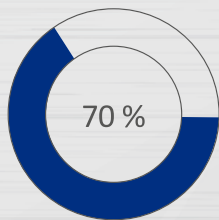
Recommendation for coating

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

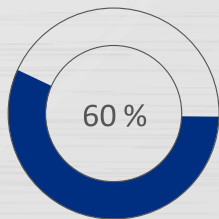
Tous les outils non revêtus sont également disponibles avec revêtement.
Contactez-nous, nous vous recommanderons volontiers le revêtement optimal pour votre application.

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

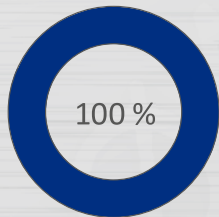
All the non-coated tools can also be offered with coating.
Please contact us to recommend the optimum coat for your application.



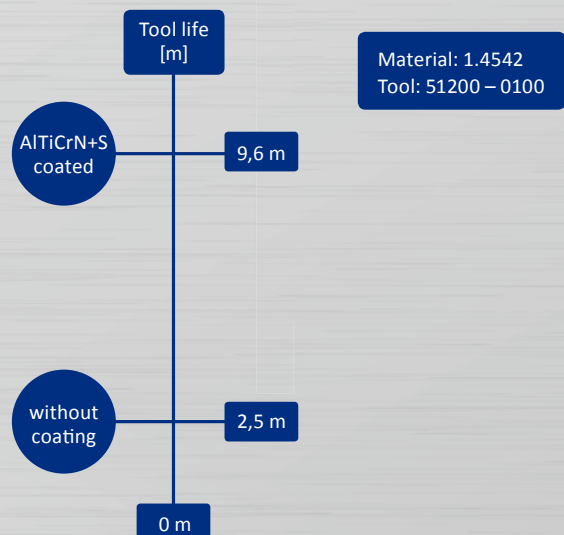
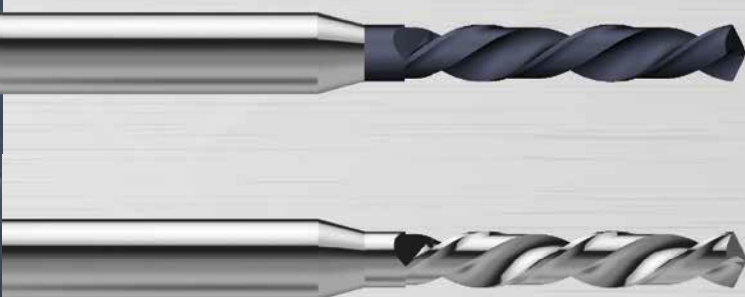
... macht die Wahl der Beschichtung im Bezug auf Ihre Anwendung aus!
... faites le choix du revêtement en fonction de votre application!
... fa la scelta del rivestimento in relazione alla vostra applicazione!
... representing the choice of the coat in relation to your application!



... 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 dell'utensile!
... cost saving as a result of a longer tool-life!



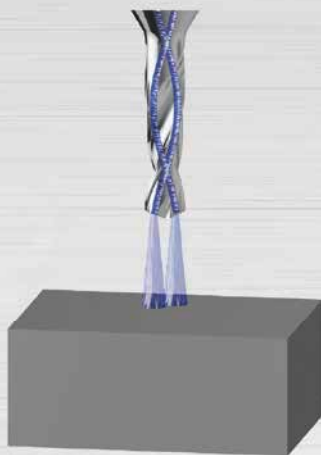
Bis zu 100 % mehr Performance!
Jusqu'à 100 % de performance en plus!
Fino al 100 % di performance!
Up to 100 % higher performance!



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

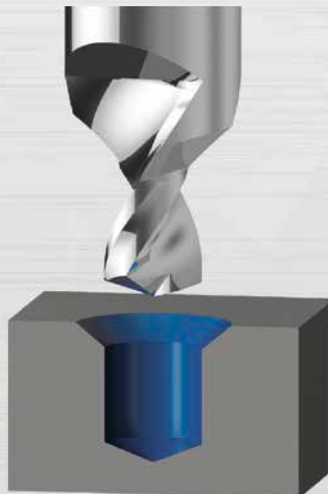
Bearbeitungsverfahren allgemein
Procédé d'usage général
Procedura d'usinaggio in generale
General machining process

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



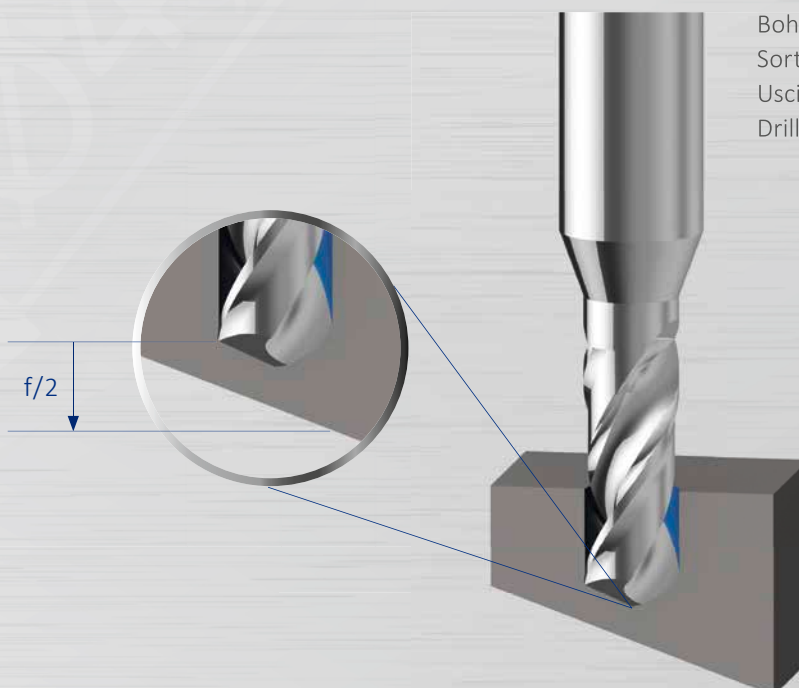
Pilotloch
 Trou pilote
 Preforo
 Pilothele



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

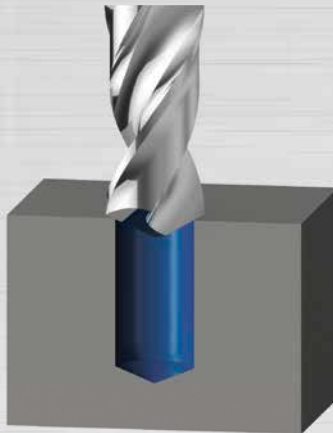
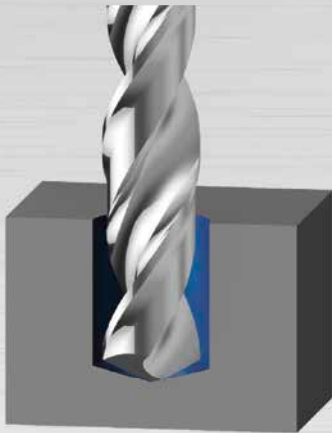


Bohreraustritt in schräger Fläche
 Sortie du foret d'une surface inclinée
 Uscita della punta in superficie inclinata
 Drill exit in an inclined surface

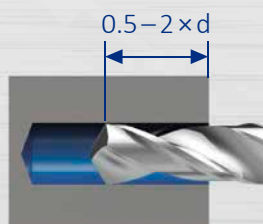
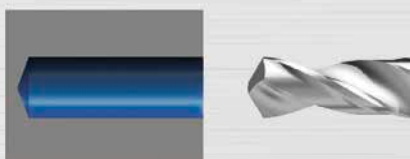
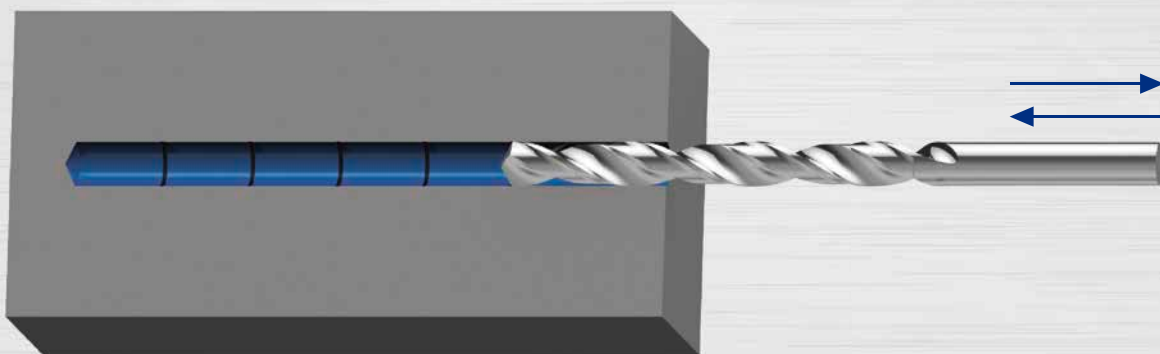


Bearbeitungsverfahren allgemein
Procédé d'usage général
Procedura d'usinaggio in generale
General machining process

Folgewerkzeug
 Outil progressif
 Utensile seguente
 Subsequent tool

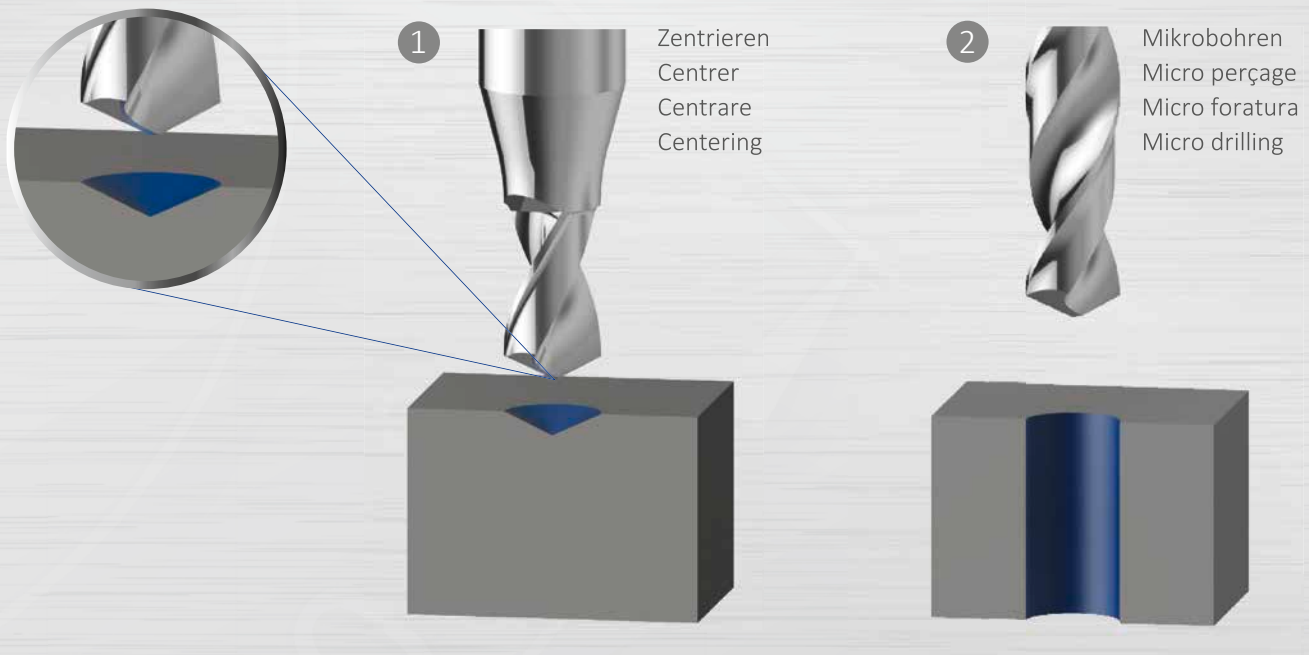


Entspänenzyklus
 Cycle de déburrage
 Ciclo evacuazione trucioli
 Pecking cycle

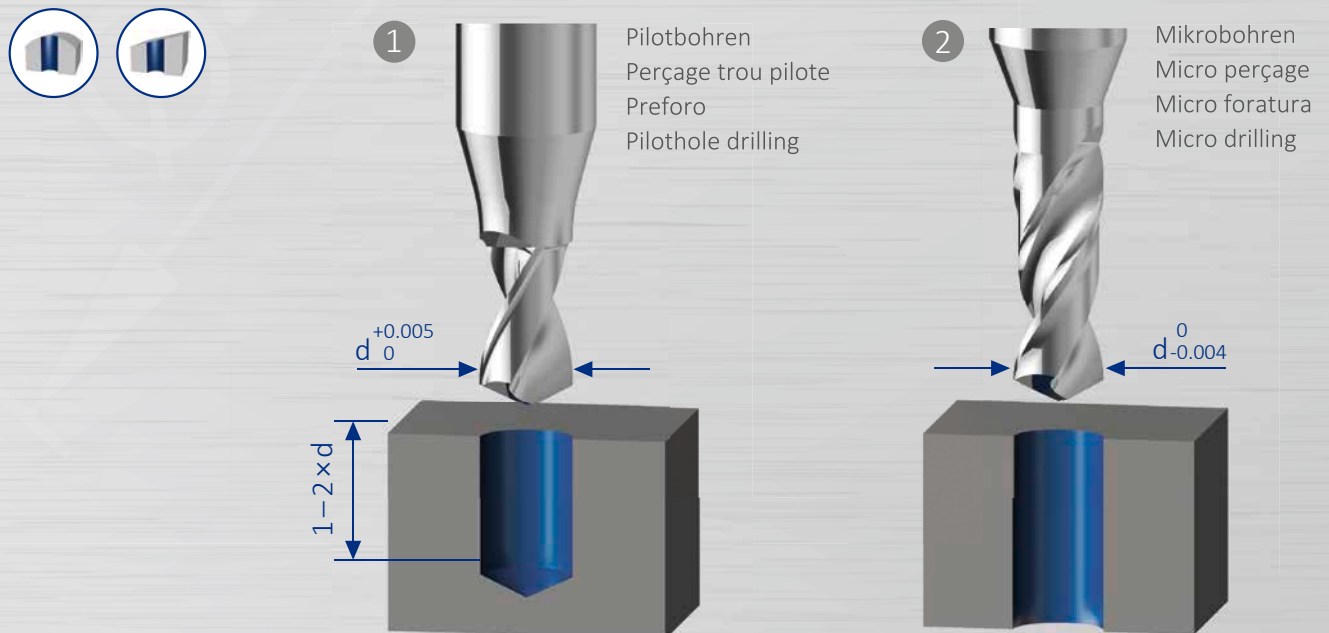


Bearbeitungsverfahren Mikrobohren **Procédé d'usinage pour micro perçage** **Procedura d'usinaggio per micro foratura** **Machining process for micro drilling**

Zentrieren $\leq 6 \times d$
 Centrer $\leq 6 \times d$
 Centrare $\leq 6 \times d$
 Centering $\leq 6 \times d$

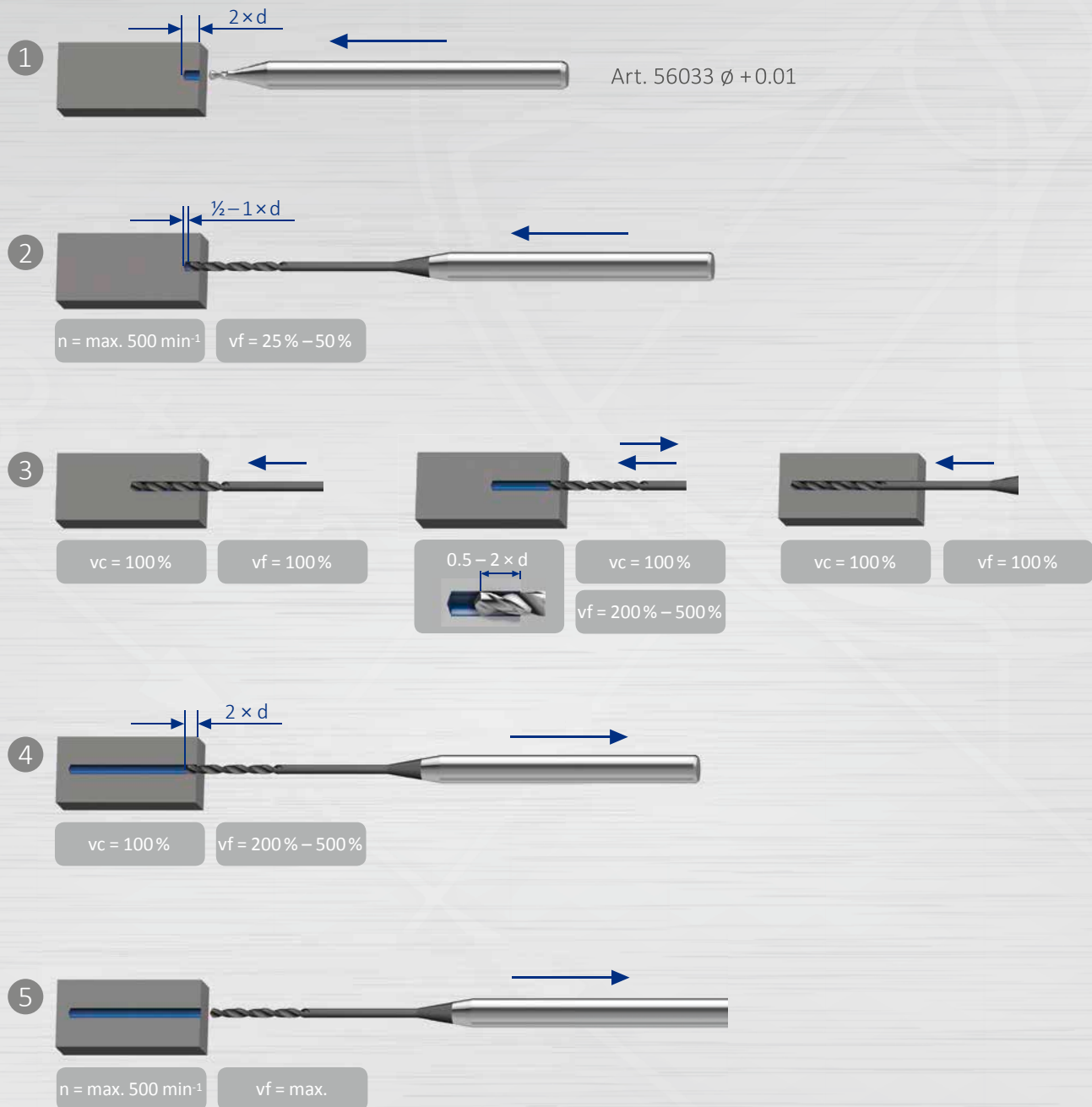


Pilotbohren $\geq 6 \times d$
 Perçage trou pilote $\geq 6 \times d$
 Preforo $\geq 6 \times d$
 Pilothele drilling $\geq 6 \times d$



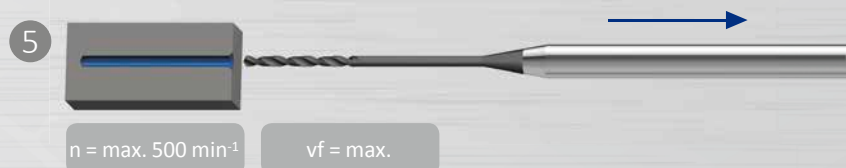
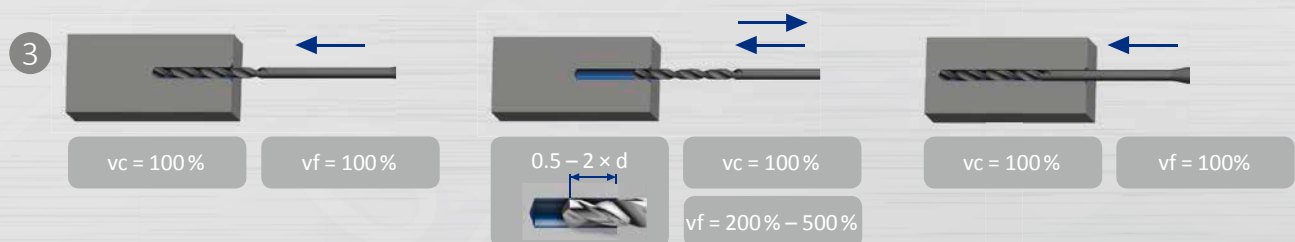
Bearbeitungsverfahren Mikrobohren **Procédé d'usage pour micro perçage** **Procedura d'usinaggio per micro foratura** **Machining process for micro drilling**

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



Bearbeitungsverfahren Mikrobohren **Procédé d'usage pour micro perçage** **Procedura d'usaggio 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

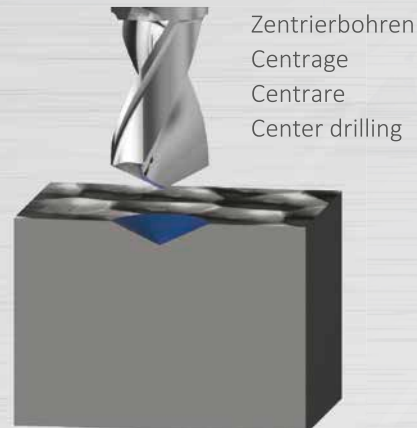


Bearbeitungsverfahren Hochleistungsbohren
Procédé d'usinage à grand rendement
Procedura d'usaggio per foratura ad alto rendimento
Machining process for high performance drilling

Zentrierung $\leq 9 \times d$
Centrer $\leq 9 \times d$
Centrare $\leq 9 \times d$
Centering $\leq 9 \times d$

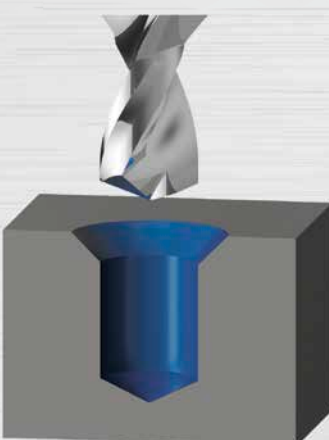


Saubere Eintrittsfläche
 Surface plate
 Superficie liscia
 Smooth entering surface

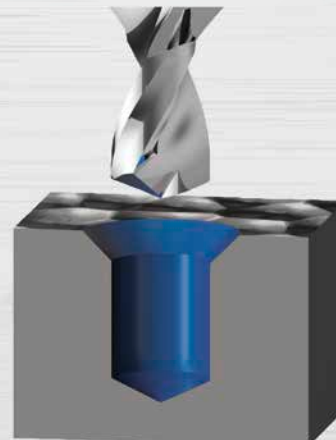


Raue oder unebene Eintrittsfläche
 Surface rugueuse ou inégale
 Superficie grezza
 Rough or uneven entering surface

Pilotbohrung $> 9 \times d$
Perçage trou pilote $> 9 \times d$
Preforo $> 9 \times d$
Pilothole drilling $> 9 \times d$



Saubere Eintrittsfläche
 Surface plate
 Superficie liscia
 Smooth entering surface



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

Bearbeitungsverfahren Hochleistungsbohren

Procédé d'usage à grand rendement

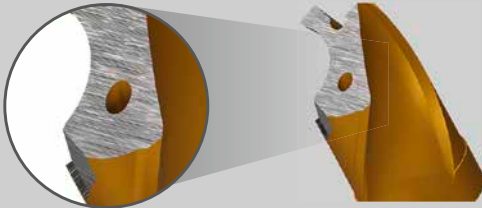
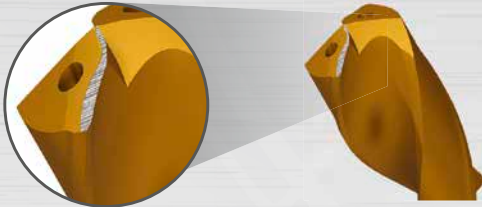
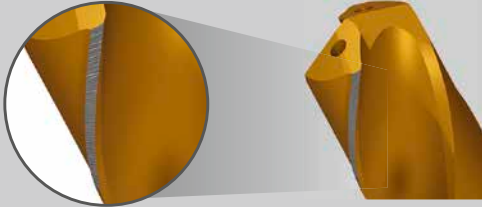
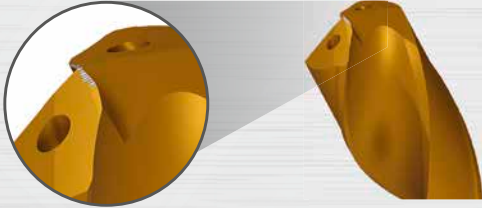
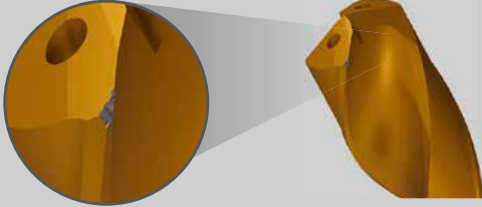
Procedura d'usinaggio per foratura ad alto rendimento

Machining process for high performance drilling

Bohrstrategie $> 9 \times d$
 Stratégie de perçage $> 9 \times d$
 Strategia di foratura $> 9 \times d$
 Drilling strategy $> 9 \times d$



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

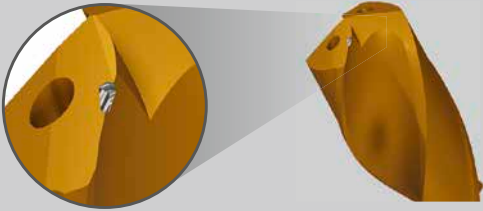
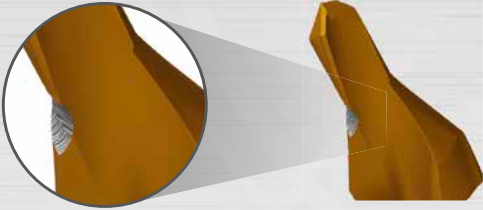
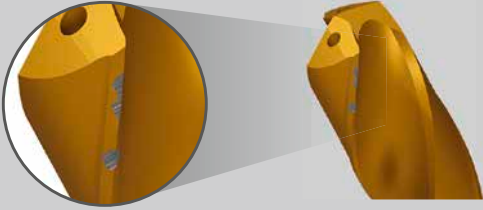
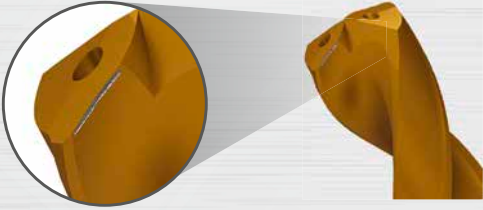
↓ verringern/réduire
ridurre/reduce

● 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

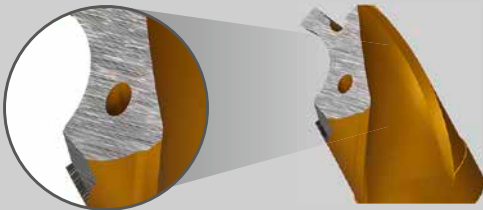
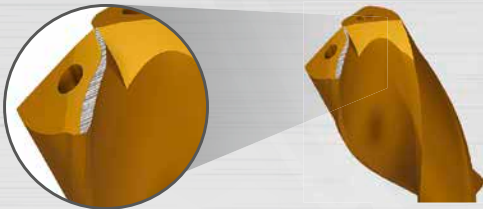
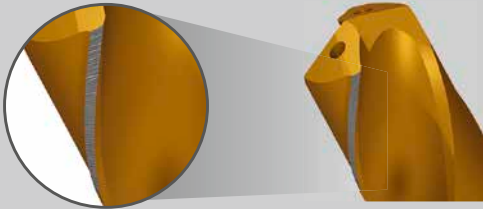
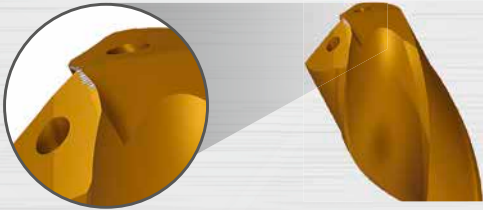
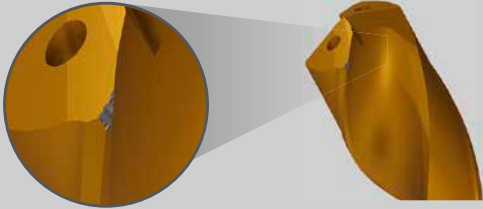
↓ verringern/réduire
ridurre/reduce

● 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 Débouillage 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 Lubrifiante / 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



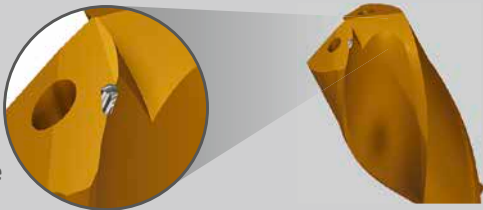
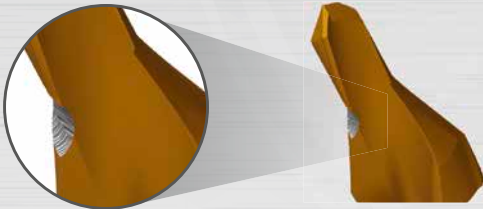
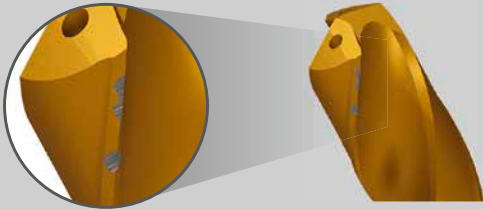
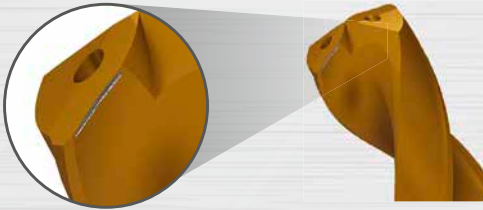
verringern/réduire
ridurre/reduce



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 Lubrifiante / 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

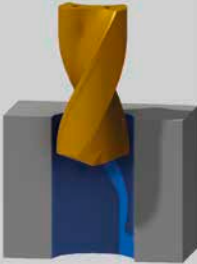
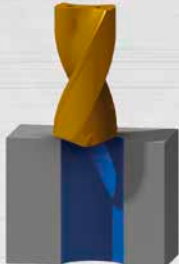
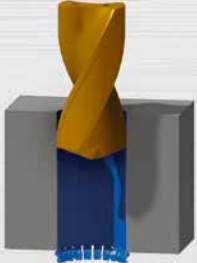
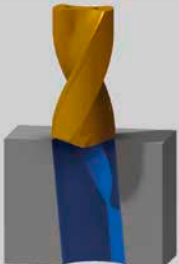
⚠ überprüfen/vérifier
controllare/verify

↓ 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 Lubrifiant / 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

⚠ 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
⚠	⚠	⚠	⚠	⚠
●	⚠	⚠	⚠	●
↑	⚠	⚠	⚠	⚠
●	●	●	⚠	●
⚠	●	⚠	⚠	⚠

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 Annullaion 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 = $\pm 10\%$

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 Änderungsmitteilungen durch die Kunden, ansonsten wird nach dem letzten Zeichnungsstand gefertigt. Änderungen 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 livraison

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 = $\pm 10\%$

de la quantité commandée.

La facturation de ces quantités à plus ou moins 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.

Paieement

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.

Tolleranza 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 = $\pm 10\%$

in più o in meno dalla quantità ordinata.

La fatturazione di queste quantità in più o meno avverrà 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 considerazione ulteriori pretese di risarcimento.

Pagamento

Se non concordato diversamente, s'intende a 30 giorni netto. Il fatturato minimo è 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 ditta Sphinx. Per utensili speciali, in particolare per gli utensili medicali la responsabilità è 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 waived 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 = $\pm 10\%$

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.

