Drilling

catalogue 2012

Index

Tool selector

according to the drilling depth and material to work

Family		Page
630.63		10

- HSS
- HSSCo
- HM

- with oil holes
- straight shank
- taper shank

- no coating
- TiN
- TiAlN

					3 x D			5 x D			8 x D			10/12 x D			15 x D			20 x D			30 x D		
	N°	Work material	Resistance	Hardness	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page
FERROUS METALS	1	Easy to machine mild steels (high sulphur carbon steels aphosphorus)	≤ 500		630.63		9	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23	136.30		63	118.30		50	144.30		69	122.30		53	123.30		54
					185.44		21	183.44		25				143.30		68	121.30		52						
					100.30		36	105.34		41				115.30		49	142.30		67						
								130.34		60				141.30		66									
								109.30		47															
								105.30		39															
								130.30		58															
								111.30		48															
	2	Non-alloyed carbon steels (≤0,4%C) (structural steels)	≤ 800		630.63		9	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23	136.30		63	118.30		50	144.30		69	122.30		53	123.30		54
					185.44		21	183.44		25				143.30		68	121.30		52						
					100.30		36	105.34		41				115.30		49	142.30		67						
								130.34		60				141.30		66									
								109.30		47															
								105.30		39															
								130.30		58															
	3	Non-alloyed carbon steels (≤0,4%C) (structural steels)	800-1.000 ≤ 700		630.63		9	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23	136.30		63	182.40		51	144.30		69	122.30		53	123.30		54
					185.44		21	183.44		25				118.30		50	121.30		52						
					100.40		37	105.34		41				143.30		68	142.30		67						
					100.30		36	130.34		60				115.30		49									
								180.40		43				141.30		66									
								192.40		62															
								109.30		47															
								105.30		36															
								130.30		58															
	4	Non-alloyed fine steels, low-alloyed steels (nitrided)	800÷1.000		630.63		9	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23	136.30		63	182.40		51	144.30		69	122.30		53	123.30		54
					185.44		21	183.44		25				118.30		50	121.30		52						
		Casehaedened and bonified alloyed structural steels	700-1.000		100.40		37	105.34		41				143.30		68	142.30		67						
					100.30		36	130.34		60				115.30		49									
								180.40		43				141.30		66									
		Tool steels	≤ 850					192.40		62															
								109.30		47															
								105.30		36															
								130.30		58															
	5	Tool alloyed steels	800-1.000		630.63		10	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		9	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23				182.40		51	144.30		69						
					185.44		21	183.44		25				118.30		50									
		Bonified fine alloyed steels (undeformable, moldings)	1.000-1.200		100.40		37	180.40		43				143.30		68									
								192.40		62															
								105.34		41															
								130.34		60															
								109.30		47															
	6	Austenitic sulphurated stainless steels easy to machine	≤ 850		630.63		9	640.63		11	650.63		12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30		65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18				184.44		31									
					185.43		19	183.43		23				182.40		51									
					185.44		21	183.44		25															
					100.40		37	181.40		27															
								180.40		43															
								192.40		62															

Tool selector | according to the drilling depth and material to work

Family		Page
630.63		10

- HSS
- HSSCo
- HM

- with oil holes
- straight shank
- taper shank

- no coating
- TiN
- TiAlN

	Nº	Work material	Resistance	Hardness	3 x D Family		3 x D Page	5 x D Family		5 x D Page	8 x D Family		8 x D Page	10/12 x D Family		10/12 x D Page	15 x D Family		15 x D Page	20 x D Family		20 x D Page	30 x D Family		30 x D Page
FERROUS METALS	7	Cr-Mo ferritic and martensitic stainless steels. Acid-resisting steels	≤ 850		630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30	⊘	65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18				184.44		31									
					185.43		19	183.43		23				182.40		51									
					185.44		21	183.44		25															
					100.40		37	181.40		27															
								180.40		43															
								192.40		62															
	8	Cr-Ni austenitic, stainless and highly heat-resistant steels (refractory)	≤ 850		630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10				184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18				184.44		31									
					185.43		19	183.43		23				182.40		51									
					185.44		21	183.44		25															
					100.40		37	181.40		27															
								180.40		43															
								192.40		62															
	9	Martensitic stainless steels. Tempered steels		45-63 HRc	630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10															
	10	Special alloys: Nimonic, Hastelloy, Inconel, K-Monel etc. Titanium and its alloys			630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10				184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18				184.44		31									
					185.43		19	183.43		23				182.40		51									
					185.44		21	183.44		25															
					100.40		37	181.40		27															
								180.40		43															
								192.40		62															
	11	Spring steel	>1.300		630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10															
	12	Mangenese steels	>1.300		630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10															
	13.1	Castings: Grey: GG Nodular: GGG Malleable: GTW-GTS		< 250 HB	630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10	250.30*	⊘	65	184.43		29	124.40		33	125.40		34	126.40		35
					100.60		17	105.60		18	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
					185.43		19	183.43		23	136.30		63	182.40		51	144.30		69	122.30		53	123.30		54
					185.44		21	183.44		25	* Only for hardness <250 HB			118.30		50	121.30		52						
					100.40		37	105.34		41				143.30		68	142.30		67						
	13.2			< 350 HB	100.30		36	130.34		60				115.30		49									
								180.40		43				141.30		66									
								192.40		62															
								109.30		47															
								105.30		36															
								130.30		58															
	14	Hardened casting		> 350 HB	630.63	⊘	9	640.63	⊘	11	650.63	⊘	12	660.63		13	670.63		14	680.63		15	690.63		16
					610.63		8	620.63		10															
NON FERROUS METALS	15	Brittle brass			100.60		17	105.60		18															
								107.30		45															
	16	Tough brass			100.60		17	105.60		18															
					185.43		19	183.43		23															
					185.44		21	183.44		25															
								105.34		41															
								130.34		60															
	17	Special high-resistant brass			185.43		19	183.43		23				184.43		29	124.40		33	125.40		34	126.40		35
					185.44		21	183.44		25				184.44		31									
								105.34		41															
								130.34		60															
								181.40		27															

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630.63		10

- HSS
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- with oil holes
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- no coating
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			3 x D			5 x D			8 x D			10/12 x D			15 x D			20 x D			30 x D		
	Nº	Work material	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page	Family		Page
NON FERROUS METALS	18	Pure copper	100.60		17	105.60		18				184.43		29									
			185.43		19	183.43		23				184.44		31									
			185.44		21	183.44		25															
						108.30		46															
						111.30		48															
	19	Coper-nickel, Copper-Tin, Copper-manganese, Copper-silicon alloys	100.60		17	105.60		18				184.43		29									
			185.43		19	183.43		23				184.44		31									
			185.44		21	183.44		25															
						105.34		41															
						130.34		60															
	20	Cu-Zn-Pb, Copper-nickel, Copper-aluminium alloys	100.60		17	105.60		18				184.43		29									
			185.43		19	183.43		23				184.44		31									
			185.44		21	183.44		25															
						105.34		41															
						130.34		60															
	21	Zinc and alloys (Zamak)	100.60		17	105.60		18				184.44		31									
			185.44		21	183.44		25															
						107.30		45															
						108.30		46															
						111.30		48															
	22	Magnesium alloys	100.60		17	105.60		18															
						107.30		45															
						108.30		46															
						111.30		48															
	23	Pure Aluminium and Aluminium alloys	100.60		17	105.60		18	138.30		64	118.30		50	124.30		55	125.30		56	126.30		57
						108.30		46				143.30		68	144.30		69	122.30		53			
						111.30		48															
						109.30		47															
	24	24.1 AlSi <10%Si Melted alloys	100.60		17	105.60		18				184.43		29									
			185.43		19	183.43		23				184.44		31									
			185.44		21	183.44		25															
						108.30		46															
						111.30		48															
		24.2 AlSi 10-14%Si Melted alloys	100.60		17	105.60		18				184.43		29									
			185.43		19	183.43		23				184.44		31									
			185.44		21	183.44		25															
NON METALLIC MATERIALS	25	Thermoplastics (soft plastics) such as PVC-plexiglas, celluloid, nylon, polystirene..	185.44		21	183.44		25	138.30		64	184.44		31	124.30		55	125.30		56	126.30		57
			100.60		17	105.60		18				118.30		50	144.30		69	122.30		53			
						109.30		47				143.30		68									
						107.30		45															
						108.30		46															
						111.30		48															
	26	Plastics with organic fillings. Pressed boards or similar, cardboards..	100.60		17	105.60		18	136.30		63	115.30		49									
			100.30		36	105.34		41															
						130.34		60															
						105.30		39															
						130.30		58															
						107.30		45															
						108.30		46															
						111.30		48															
	27	Hard rubbers (ebonite, vulcanite) Synthetic resins (bakelite, galatite, artificial erinoid-header)	100.60		17	105.60		18															
						107.30		45															
	28	Duroplastics - Thermostables	100.60		17	105.60		18															
	29	Graphite				105.34		41															
						130.34		60															
						107.30		45															
	30	Fiber cement, slate, marble	100.60		17	105.60		18															

Production programme

HSS
HSSCo
HM

100.30
N 36
type | page

with oil holes
no coating
TiN
TiAlN

Straight shank drills

DIN 1897 | DIN 338 | DIN 340

3 x D

100.30	100.40	100.60	185.43	185.44
N 36	NF 37	N 17	SLZ 19	SLZ 21

5 x D

105.30	105.34	105.60	107.30	108.30	109.30	111.30	180.40	181.40	183.43	183.44
N 39	N 41	N 18	H 45	W 46	NV 47	WV 48	NF 43	NG 27	SLZ 23	SLZ 25

10 x D

115.30	118.30	182.40	184.43	184.44
N 49	NV 50	NF 51	SLZ 29	SLZ 31

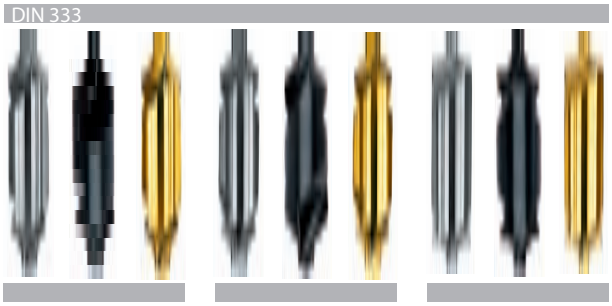
Multifunction drills

DIN 1897 | DIN 1898 | DIN 1899 | DIN 8374 | DIN 8376 | DIN 8377 | DIN 8378 | DIN LATZ

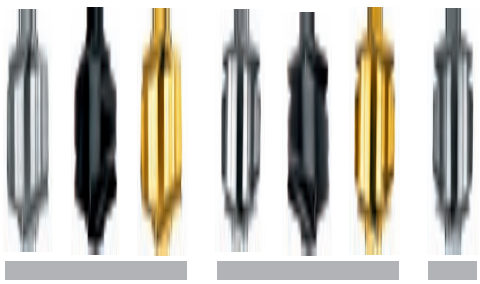
102.30	178.40	178.60	160.30	162.30	163.30	164.30	167.30	168.30	664.63
N 38	NC 78	NC 78	N 79	N 79	N 80	N 80	N 81	N 81	SN 82

Centre drills

DIN 333



150.3B	150.3N	150.34	151.3B	151.3N	151.34	152.3B	152.3N	152.34
R 70	R 70	R 71	A 71	A 72	A 72	B 73	B 73	B 74



153.3B	153.3N	153.34	156.3B	156.3N	156.34	151.60
AR 74	AR 75	AR 75	A 76	A 76	A 77	B 77

HSS
HSSCo
HM

100.30
N 36
type | page

with oil holes
no coating
TiN
TiAlN

DIN 1869/1 | DIN 1869/2 | DIN 1869/3

15 x D			20 x D			30 x D		
121.30	124.30	124.40	122.30	125.30	125.40	123.30	126.30	126.40
N 52	NV 55	SLZ 33	N 53	NV 56	SLZ 34	N 54	NV 57	SLZ 35

DIN6537K | DIN6537L

3 x D		5 x D		8 x D	12 x D	15 x D	20 x D	30 x D
610.63	630.63	620.63	640.63	650.63	660.63	670.63	680.63	690.63
SN 8	SN 9	SN 10	SN 11	SN 12	SN 13	SN 14	SN 15	SN 16

Boxed sets of drills

DIN 338 | DIN6537L

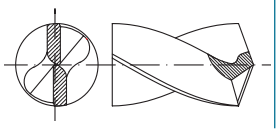
5 x D							
105.30	105.34	180.40	181.40	183.43	183.44	620.63	640.63
N 83	N 83	NF 83	NG 83	SLZ 83	SLZ 83	SN 83	SN 83

Taper shank drills

DIN345 | DIN341 | DIN1872/1 | DIN1870/2

5 x D			8 x D			10 x D		15 x D	
130.30	130.34	192.40	136.30	138.30	250.30	141.30	143.30	142.30	144.30
N 58	N 60	NG 62	N 63	NV 64	NV 65	N 66	N 68	NV 67	NV 69

610.63
DIN 6537 K 3 X D



Optimus series HM | Type SN 3 x D | TiAlN

Short series. High performance
Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

Shank type	Family
HE	A61563DDDDD00
HB	A61863DDDDD00

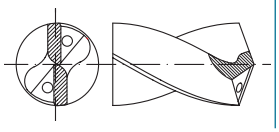
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	62	20	6	**A610630300000**	**29,65**
3,3	62	20	6	**A610630330000**	**29,65**
3,5	62	20	6	**A610630350000**	**29,65**
3,7	62	20	6	**A610630370000**	**29,65**
3,8	66	24	6	**A610630380000**	**29,65**
4	66	24	6	**A610630400000**	**29,65**
4,2	66	24	6	**A610630420000**	**29,65**
4,5	66	24	6	**A610630450000**	**29,65**
4,7	66	24	6	**A610630470000**	**29,65**
4,8	66	28	6	**A610630480000**	**29,65**
5	66	28	6	**A610630500000**	**29,65**
5,3	66	28	6	**A610630530000**	**29,65**
5,5	66	28	6	**A610630550000**	**29,65**
5,8	66	28	6	**A610630580000**	**29,65**
6	66	28	6	**A610630600000**	**29,65**
6,3	79	34	8	**A610630630000**	**29,65**
6,5	79	34	8	**A610630650000**	**29,65**
6,8	79	34	8	**A610630680000**	**29,65**
7	79	34	8	**A610630700000**	**29,65**
7,4	79	41	8	**A610630740000**	**29,65**
7,5	79	41	8	**A610630750000**	**29,65**
7,8	79	41	8	**A610630780000**	**29,65**
8	79	41	8	**A610630800000**	**29,65**
8,5	89	47	10	**A610630850000**	**33,31**
8,8	89	47	10	**A610630880000**	**33,31**
9	89	47	10	**A610630900000**	**33,31**
9,2	89	47	10	**A610630920000**	**33,31**
9,5	89	47	10	**A610630950000**	**33,31**
9,8	89	47	10	**A610630980000**	**33,31**
10	89	47	10	**A610631000000**	**33,31**
10,2	102	55	12	**A610631020000**	**49,68**
10,5	102	55	12	**A610631050000**	**49,68**
10,8	102	55	12	**A610631080000**	**49,68**
11	102	55	12	**A610631100000**	**49,68**
11,2	102	55	12	**A610631120000**	**49,68**
11,5	102	55	12	**A610631150000**	**49,68**
11,8	102	55	12	**A610631180000**	**49,68**
12	102	55	12	**A610631200000**	**49,68**
12,5	107	60	14	**A610631250000**	**66,12**
12,8	107	60	14	**A610631280000**	**66,12**
13	107	60	14	**A610631300000**	**66,12**
13,5	107	60	14	**A610631350000**	**66,12**
13,8	107	60	14	**A610631380000**	**66,12**
14	107	60	14	**A610631400000**	**66,12**
14,5	115	65	16	**A610631450000**	**87,49**
14,8	115	65	16	**A610631480000**	**87,49**
15	115	65	16	**A610631500000**	**87,49**
15,5	115	65	16	**A610631550000**	**87,49**
15,8	115	65	16	**A610631580000**	**87,49**
16	115	65	16	**A610631600000**	**87,49**

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
16,5	123	73	18	**A610631650000**	**146,58**
17	123	73	18	**A610631700000**	**146,58**
17,5	123	73	18	**A610631750000**	**146,58**
18	123	73	18	**A610631800000**	**146,58**
18,5	131	79	20	**A610631850000**	**189,82**
19	131	79	20	**A610631900000**	**189,82**
19,5	131	79	20	**A610631950000**	**189,82**
20	131	79	20	**A610632000000**	**189,82**

630.63
DIN 6537 K 3 X D



Optimus series HM | Type SN 3 x D | TiAlN

Short series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

Shank type	Family
HE	A63563DDDDD00
HB	A63863DDDDD00

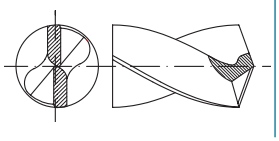
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	62	20	6	**A630630300000**	**40,72**
3,3	62	20	6	**A630630330000**	**40,72**
3,5	62	20	6	**A630630350000**	**40,72**
3,7	62	20	6	**A630630370000**	**40,72**
3,8	66	24	6	**A630630380000**	**40,72**
4	66	24	6	**A630630400000**	**40,72**
4,2	66	24	6	**A630630420000**	**40,72**
4,5	66	24	6	**A630630450000**	**40,72**
4,7	66	24	6	**A630630470000**	**40,72**
4,8	66	28	6	**A630630480000**	**40,72**
5	66	28	6	**A630630500000**	**40,72**
5,3	66	28	6	**A630630530000**	**40,72**
5,5	66	28	6	**A630630550000**	**40,72**
5,8	66	28	6	**A630630580000**	**40,72**
6	66	28	6	**A630630600000**	**40,72**
6,3	79	34	8	**A630630630000**	**55,28**
6,5	79	34	8	**A630630650000**	**55,28**
6,8	79	34	8	**A630630680000**	**55,28**
7	79	34	8	**A630630700000**	**55,28**
7,4	79	41	8	**A630630740000**	**55,28**
7,5	79	41	8	**A630630750000**	**55,28**
7,8	79	41	8	**A630630780000**	**55,28**
8	79	41	8	**A630630800000**	**55,28**
8,5	89	47	10	**A630630850000**	**61,93**
8,8	89	47	10	**A630630880000**	**61,93**
9	89	47	10	**A630630900000**	**61,93**
9,2	89	47	10	**A630630920000**	**61,93**
9,5	89	47	10	**A630630950000**	**61,93**
9,8	89	47	10	**A630630980000**	**61,93**
10	89	47	10	**A630631000000**	**61,93**
10,2	102	55	12	**A630631020000**	**88,49**
10,5	102	55	12	**A630631050000**	**88,49**
10,8	102	55	12	**A630631080000**	**88,49**
11	102	55	12	**A630631100000**	**88,49**
11,2	102	55	12	**A630631120000**	**88,49**
11,5	102	55	12	**A630631150000**	**88,49**
11,8	102	55	12	**A630631180000**	**88,49**
12	102	55	12	**A630631200000**	**88,49**
12,5	107	60	14	**A630631250000**	**123,13**
12,8	107	60	14	**A630631280000**	**123,13**
13	107	60	14	**A630631300000**	**123,13**
13,5	107	60	14	**A630631350000**	**123,13**
13,8	107	60	14	**A630631380000**	**123,13**
14	107	60	14	**A630631400000**	**123,13**
14,5	115	65	16	**A630631450000**	**152,39**
14,8	115	65	16	**A630631480000**	**152,39**
15	115	65	16	**A630631500000**	**152,39**
15,5	115	65	16	**A630631550000**	**152,39**
15,8	115	65	16	**A630631580000**	**152,39**
16	115	65	16	**A630631600000**	**152,39**

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
16,5	123	73	18	**A630631650000**	**240,28**
17	123	73	18	**A630631700000**	**240,28**
17,5	123	73	18	**A630631750000**	**240,28**
18	123	73	18	**A630631800000**	**240,28**
18,5	131	79	20	**A630631850000**	**264,04**
19	131	79	20	**A630631900000**	**264,04**
19,5	131	79	20	**A630631950000**	**264,04**
20	131	79	20	**A630632000000**	**264,04**

620.63
DIN 6537 L 5 X D



Optimus series HM | Type SN 5 x D | TiAlN

Long series. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

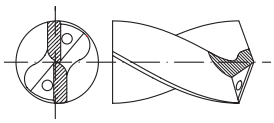
Shank type	Family
HE	A62563DDDDD00
HB	A62863DDDDD00

Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	66	28	6	**A620630300000**	**34,04**
3,3	66	28	6	**A620630330000**	**34,04**
3,5	66	28	6	**A620630350000**	**34,04**
3,7	66	28	6	**A620630370000**	**34,04**
3,8	74	36	6	**A620630380000**	**34,04**
4	74	36	6	**A620630400000**	**34,04**
4,2	74	36	6	**A620630420000**	**34,04**
4,5	74	36	6	**A620630450000**	**34,04**
4,7	74	36	6	**A620630470000**	**34,04**
4,8	82	44	6	**A620630480000**	**34,04**
5	82	44	6	**A620630500000**	**34,04**
5,2	82	44	6	**A620630520000**	**34,04**
5,5	82	44	6	**A620630550000**	**34,04**
5,8	82	44	6	**A620630580000**	**34,04**
6	82	44	6	**A620630600000**	**34,04**
6,3	91	53	8	**A620630630000**	**34,04**
6,5	91	53	8	**A620630650000**	**34,65**
6,8	91	53	8	**A620630680000**	**34,65**
7	91	53	8	**A620630700000**	**34,65**
7,4	91	53	8	**A620630740000**	**34,65**
7,5	91	53	8	**A620630750000**	**34,65**
7,8	91	53	8	**A620630780000**	**34,65**
8	91	53	8	**A620630800000**	**34,65**
8,5	103	61	10	**A620630850000**	**38,27**
8,8	103	61	10	**A620630880000**	**38,27**
9	103	61	10	**A620630900000**	**38,27**
9,2	103	61	10	**A620630920000**	**38,27**
9,5	103	61	10	**A620630950000**	**38,27**
9,8	103	61	10	**A620630980000**	**38,27**
10	103	61	10	**A620631000000**	**38,27**
10,2	118	71	12	**A620631020000**	**56,95**
10,5	118	71	12	**A620631050000**	**56,95**
10,8	118	71	12	**A620631080000**	**56,95**
11	118	71	12	**A620631100000**	**56,95**
11,2	118	71	12	**A620631120000**	**90,51**
11,5	118	71	12	**A620631150000**	**56,95**
11,8	118	71	12	**A620631180000**	**56,95**
12	118	71	12	**A620631200000**	**56,95**
12,5	124	77	14	**A620631250000**	**74,60**
12,8	124	77	14	**A620631280000**	**74,60**
13	124	77	14	**A620631300000**	**74,60**
13,5	124	77	14	**A620631350000**	**74,60**
13,8	124	77	14	**A620631380000**	**74,60**
14	124	77	14	**A620631400000**	**74,60**
14,5	133	83	16	**A620631450000**	**99,00**
14,8	133	83	16	**A620631480000**	**99,00**
15	133	83	16	**A620631500000**	**99,00**
15,5	133	83	16	**A620631550000**	**99,00**
15,8	133	83	16	**A620631580000**	**99,00**
16	133	83	16	**A620631600000**	**99,00**

640.63
DIN 6537 L 5 X D



Optimus series HM | Type SN 5 x D | TiAlN

Long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

Shank type	Family
HE	A64563DDDDD00
HB	A64863DDDDD00

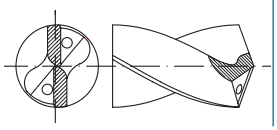
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	66	28	6	**A640630300000**	**52,25**
3,3	66	28	6	**A640630330000**	**52,25**
3,5	66	28	6	**A640630350000**	**52,25**
3,7	66	28	6	**A640630370000**	**52,25**
3,8	74	36	6	**A640630380000**	**52,25**
4	74	36	6	**A640630400000**	**52,25**
4,2	74	36	6	**A640630420000**	**52,25**
4,5	74	36	6	**A640630450000**	**52,25**
4,7	74	36	6	**A640630470000**	**52,25**
4,8	82	44	6	**A640630480000**	**52,25**
5	82	44	6	**A640630500000**	**52,25**
5,2	82	44	6	**A640630520000**	**52,25**
5,5	82	44	6	**A640630550000**	**52,25**
5,8	82	44	6	**A640630580000**	**52,25**
6	82	44	6	**A640630600000**	**52,25**
6,5	91	53	8	**A640630650000**	**57,71**
6,8	91	53	8	**A640630680000**	**57,71**
7	91	53	8	**A640630700000**	**57,71**
7,4	91	53	8	**A640630740000**	**57,71**
7,8	91	53	8	**A640630780000**	**57,71**
8	91	53	8	**A640630800000**	**57,71**
8,5	103	61	10	**A640630850000**	**66,17**
8,8	103	61	10	**A640630860000**	**66,17**
9	103	61	10	**A640630900000**	**66,17**
9,2	103	61	10	**A640630920000**	**66,17**
9,5	103	61	10	**A640630950000**	**66,17**
9,8	103	61	10	**A640630980000**	**66,17**
10	103	61	10	**A640631000000**	**66,17**
10,2	118	71	12	**A640631020000**	**96,38**
10,5	118	71	12	**A640631050000**	**96,38**
10,8	118	71	12	**A640631080000**	**96,38**
11	118	71	12	**A640631100000**	**96,38**
11,2	118	71	12	**A640631120000**	**96,38**
11,5	118	71	12	**A640631150000**	**96,38**
11,8	118	71	12	**A640631180000**	**96,38**
12	118	71	12	**A640631200000**	**96,38**
12,5	124	77	14	**A640631210000**	**129,22**
12,8	124	77	14	**A640631280000**	**129,22**
13	124	77	14	**A640631300000**	**129,22**
13,5	124	77	14	**A640631350000**	**129,22**
13,8	124	77	14	**A640631380000**	**129,22**
14	124	77	14	**A640631400000**	**129,22**
14,5	133	83	16	**A640631410000**	**161,47**
14,8	133	83	16	**A640631480000**	**161,47**
15	133	83	16	**A640631500000**	**161,47**
15,5	133	83	16	**A640631550000**	**161,47**
15,8	133	83	16	**A640631560000**	**161,47**
16	133	83	16	**A640631600000**	**161,47**
16,5	143	93	18	**A640631650000**	**256,34**
17	143	93	18	**A640631700000**	**256,34**

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
17,5	143	93	18	**A640631750000**	**256,34**
18	143	93	18	**A640631800000**	**256,34**
18,5	153	101	20	**A640631850000**	**279,63**
19	153	101	20	**A640631900000**	**279,63**
19,5	153	101	20	**A640631950000**	**279,63**
20	153	101	20	**A640632000000**	**279,63**

650.63
DIN 6537 L 8 X D



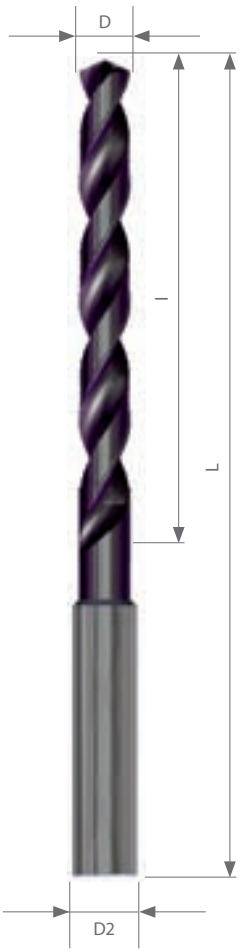
Optimus series HM | Type SN 8 x D | TiAlN

Extra long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN



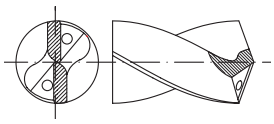
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	72	34	6	**A650630300000**	**105,93**
3,3	72	34	6	**A650630330000**	**105,93**
3,5	72	34	6	**A650630350000**	**105,93**
4	81	43	6	**A650630400000**	**105,93**
4,2	81	43	6	**A650630420000**	**105,93**
4,5	81	43	6	**A650630450000**	**105,93**
5	85	57	6	**A650630500000**	**105,93**
5,5	85	57	6	**A650630550000**	**105,93**
6	85	57	6	**A650630600000**	**105,93**
6,5	114	76	8	**A650630650000**	**122,88**
6,8	114	76	8	**A650630680000**	**122,88**
7	114	76	8	**A650630700000**	**122,88**
7,5	114	76	8	**A650630750000**	**122,88**
8	114	76	8	**A650630800000**	**122,88**
8,5	142	95	10	**A650630850000**	**148,30**
9	142	95	10	**A650630900000**	**148,30**
9,5	142	95	10	**A650630950000**	**148,30**
10	142	95	10	**A650631000000**	**148,30**
10,2	162	114	12	**A650631020000**	**195,97**
10,5	162	114	12	**A650631050000**	**195,97**
11	162	114	12	**A650631100000**	**195,97**
11,5	162	114	12	**A650631150000**	**195,97**
12	162	114	12	**A650631200000**	**277,54**
12,5	178	133	14	**A650631250000**	**277,54**
13	178	133	14	**A650631300000**	**277,54**
13,5	178	133	14	**A650631350000**	**277,54**
14	178	133	14	**A650631400000**	**277,54**
14,5	203	152	16	**A650631450000**	**347,45**
15	203	152	16	**A650631500000**	**347,45**
15,5	203	152	16	**A650631550000**	**347,45**
16	203	152	16	**A650631600000**	**347,45**
16,5	222	171	18	**A650631650000**	**434,31**
17	222	171	18	**A650631700000**	**434,31**
17,5	222	171	18	**A650631750000**	**434,31**
18	222	171	18	**A650631800000**	**434,31**
18,5	243	190	20	**A650631850000**	**510,58**
19	243	190	20	**A650631900000**	**510,58**
19,5	243	190	20	**A650631950000**	**510,58**
20	243	190	20	**A650632000000**	**510,58**

Shank type	Family
HE	**A65563DDDDD00**
HB	**A65863DDDDD00**

660.63
DIN 6537 L 12 X D



Optimus series HM | Type SN 12 x D | TiAlN

Extra long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30º
Point angle	140º
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

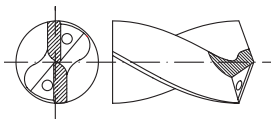
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	86	46	6	**A660630300000**	**171,58**
3,5	94	54	6	**A660630350000**	**171,58**
4	101	61	6	**A660630400000**	**171,58**
4,5	109	69	6	**A660630450000**	**171,58**
5	116	76	6	**A660630500000**	**171,58**
5,5	124	84	6	**A660630550000**	**171,58**
6	131	91	6	**A660630600000**	**171,58**
6,5	139	99	8	**A660630650000**	**231,53**
7	146	106	8	**A660630700000**	**231,53**
7,5	154	114	8	**A660630750000**	**231,53**
8	161	121	8	**A660630800000**	**231,53**
8,5	173	129	10	**A660630850000**	**282,18**
9	180	136	10	**A660630900000**	**282,18**
9,5	189	145	10	**A660630950000**	**282,18**
10	196	152	10	**A660631000000**	**282,18**
10,5	209	160	12	**A660631050000**	**403,11**
11	216	167	12	**A660631100000**	**403,11**
11,5	224	175	12	**A660631150000**	**403,11**
12	231	182	12	**A660631200000**	**403,11**

Shank type		Family
HE		**A66563DDDDD00**
HB		**A66863DDDDD00**

670.63
DIN 6537 L 15 X D



Optimus series HM | Type SN 15 x D | TiAlN

Extra long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

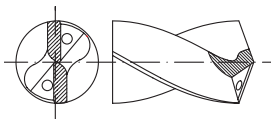
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	95	55	6	**A670630300000**	**202,02**
3,5	104	64	6	**A670630350000**	**202,02**
4	113	73	6	**A670630400000**	**202,02**
4,5	122	82	6	**A670630450000**	**202,02**
5	131	91	6	**A670630500000**	**202,02**
5,5	140	100	6	**A670630550000**	**202,02**
6	149	109	6	**A670630600000**	**202,02**
6,5	158	118	8	**A670630650000**	**266,88**
7	167	127	8	**A670630700000**	**266,88**
7,5	176	136	8	**A670630750000**	**266,88**
8	185	145	8	**A670630800000**	**266,88**
8,5	198	154	10	**A670630850000**	**323,23**
9	207	163	10	**A670630900000**	**323,23**
9,5	217	173	10	**A670630950000**	**323,23**
10	226	182	10	**A670631000000**	**323,23**
10,5	240	191	12	**A670631050000**	**473,15**
11	249	200	12	**A670631100000**	**473,15**
11,5	258	209	12	**A670631150000**	**473,15**
12	167	218	12	**A670631200000**	**473,15**

Shank type		Family
HE		A67563DDDDD00
HB		A67863DDDDD00

680.63
DIN 6537 L 20 X D



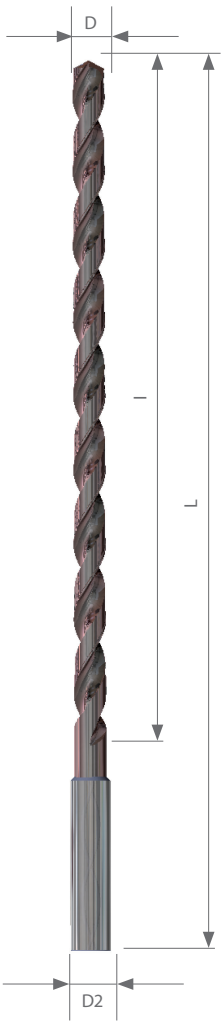
Optimus series HM | Type SN 20 x D | TiAlN

Extra long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30º
Point angle	140º
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN



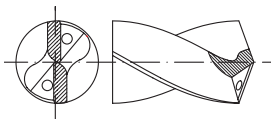
Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	110	70	6	**A680630300000**	**232,85**
3,5	122	82	6	**A680630350000**	**232,85**
4	133	93	6	**A680630400000**	**232,85**
4,5	145	105	6	**A680630450000**	**232,85**
5	156	116	6	**A680630500000**	**232,85**
5,5	168	128	6	**A680630550000**	**232,85**
6	179	139	6	**A680630600000**	**232,85**
6,5	191	151	8	**A680630650000**	**306,21**
7	202	162	8	**A680630700000**	**306,21**
7,5	214	174	8	**A680630750000**	**306,21**
8	225	185	8	**A680630800000**	**306,21**
8,5	241	197	10	**A680630850000**	**388,08**
9	252	208	10	**A680630900000**	**388,08**
9,5	265	221	10	**A680630950000**	**388,08**
10	276	232	10	**A680631000000**	**388,08**
10,5	293	244	12	**A680631050000**	**535,87**
11	304	255	12	**A680631100000**	**535,87**
11,5	313	264	12	**A680631150000**	**535,87**
12	322	273	12	**A680631200000**	**535,87**

Shank type		Family
HE		A68563DDDDD00
HB		A68863DDDDD00

690.63
DIN 6537 L 30 X D



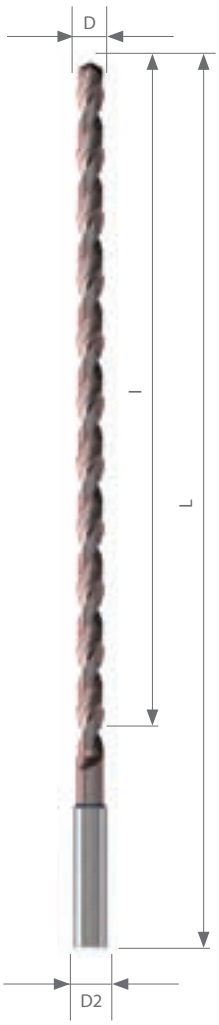
Optimus series HM | Type SN 30 x D | TiAlN

Extra long series with internal cooling. High performance

Straight shank drills

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	m7 (D_2: h6)
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN



Details and applications

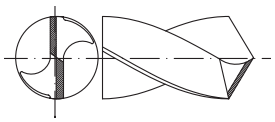
High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc.

D	L	l	D2	Code	Price
mm.	mm.	mm.	mm.		€
3	140	100	6	**A690630300000**	**294,06**
3,5	157	117	6	**A690630350000**	**294,06**
4	173	133	6	**A690630400000**	**294,06**
4,5	190	150	6	**A690630450000**	**294,06**
5	206	166	6	**A690630500000**	**294,06**
5,5	223	183	6	**A690630550000**	**294,06**
6	239	199	6	**A690630600000**	**294,06**
6,5	256	216	8	**A690630650000**	**398,48**
7	272	232	8	**A690630700000**	**398,48**
7,5	289	249	8	**A690630750000**	**398,48**
8	305	265	8	**A690630800000**	**398,48**

Shank type		Family
HE		A69563DDDDD00
HB		A69863DDDDD00

100.60
DIN 1897

Classic series HM | Type N 3 x D



Standard stub drills
Straight shank drills

Details and applications

High performance straight shank drill for the highest hole quality at a economic cost. To drill castings, cast steel, Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc..

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	120°
Point grinding	4 Lands
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

D	L	l	Code	Price
mm.	mm.	mm.		€
2	38	12	**A100600200000**	**7,57**
2,5	43	14	**A100600250000**	**9,04**
3	46	16	**A100600300000**	**11,79**
3,5	52	20	**A100600350000**	**14,36**
4	55	22	**A100600400000**	**16,93**
4,5	58	24	**A100600450000**	**19,81**
5	62	26	**A100600500000**	**23,28**
5,5	66	28	**A100600550000**	**28,67**
6	66	28	**A100600600000**	**31,48**
6,5	70	31	**A100600650000**	**36,93**
7	74	34	**A100600700000**	**42,38**
7,5	74	34	**A100600750000**	**50,14**
8	79	37	**A100600800000**	**51,93**
8,5	79	37	**A100600850000**	**65,66**
9	84	40	**A100600900000**	**65,66**
9,5	84	40	**A100600950000**	**75,84**
10	89	43	**A100601000000**	**81,36**
10,5	89	43	**A100601050000**	**96,50**
11	95	47	**A100601100000**	**108,61**
12	102	51	**A100601200000**	**128,55**

Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	80	90	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
2	60	80	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
3	65	80	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
4	55	70	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
5	34	45	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
6	25	30	(B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
7	25	30	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
8	25	30	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
10	17	23	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
13.1	80	100	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
13.2	65	90	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
15	200	200	(A) (B)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
16	135	135	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
18	80	80	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
19	50	80	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
20	40	80	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
21	180	180	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
22	200	200	(D)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
23	170	200	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24.1	170	170	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24.2	135	170	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
25	45	45	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
26	45	45	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
27	55	55	(D)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
29	90	90	(D)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
31	18	35	(D)	MANUAL										

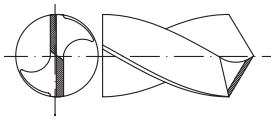
Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

105.60
DIN 338

Classic series HM

Type HG 5 x D



Jobber drills
Straight shank drills

Details and applications

High performance straight shank drill for the highest hole quality at a economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc..

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	120°
Point grinding	4 Lands
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

D	L	l	Code	Price
mm.	mm.	mm.		€
2	49	24	**A105600200000**	**10,84**
2,5	57	30	**A105600250000**	**13,01**
3	61	33	**A105600300000**	**17,30**
3,5	70	39	**A105600350000**	**20,52**
4	75	43	**A105600400000**	**21,92**
4,5	80	47	**A105600450000**	**28,72**
5	86	52	**A105600500000**	**32,51**
5,5	93	57	**A105600550000**	**42,13**
6	93	57	**A105600600000**	**45,20**
6,5	101	63	**A105600650000**	**54,69**
7	109	69	**A105600700000**	**64,18**
7,5	109	69	**A105600750000**	**71,81**
8	117	75	**A105600800000**	**76,62**
8,5	117	75	**A105600850000**	**84,25**
9	125	81	**A105600900000**	**92,97**
9,5	125	81	**A105600950000**	**107,97**
10	133	87	**A105601000000**	**118,87**
10,2	133	87	**A105601020000**	**136,63**
10,5	133	87	**A105601050000**	**150,35**
11	142	94	**A105601100000**	**164,07**
12	151	101	**A105601200000**	**198,25**

Cutting conditions and recommended material

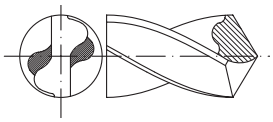
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	70	80	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
2	55	70	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
3	60	70	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
4	50	60	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
5	30	40	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
6	22	27	(B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
7	22	27	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
8	22	27	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
10	15	20	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
13.1	70	90	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
13.2	60	80	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
15	180	180	(A) (B)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
16	120	120	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
18	70	70	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
19	45	70	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
20	35	70	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
21	160	160	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
22	180	180	(D)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
23	150	180	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24.1	150	150	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24.2	120	150	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
25	40	40	(A) (D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
26	40	40	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
27	50	50	(D)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
29	80	80	(D)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
31	16	31,5	(D)	MANUAL										

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

185.43
DIN 1897

Optimus series HSSCo 5 % | Type SLZ 3 x D | TiAlN

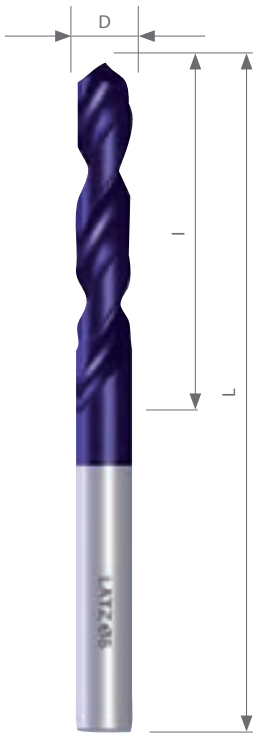


Standar stub drills. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiAlN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiAlN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 3 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 100.40 and 100.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	38	12	A185430200000	8,22
2,1	38	12	A185430210000	8,89
2,2	40	13	A185430220000	8,89
2,3	40	13	A185430230000	8,89
2,4	43	14	A185430240000	9,26
2,5	43	14	A185430250000	8,22
2,6	43	14	A185430260000	8,89
2,7	46	16	A185430270000	9,26
2,8	46	16	A185430280000	9,26
2,9	46	16	A185430290000	9,26
3	46	16	A185430300000	8,89
3,1	49	18	A185430310000	9,63
3,2	49	18	A185430320000	9,63
3,3	49	18	A185430330000	9,63
3,4	52	20	A185430340000	9,68
3,5	52	20	A185430350000	10,06
3,6	52	20	A185430360000	10,98
3,7	52	20	A185430370000	10,98
3,8	55	22	A185430380000	10,98
3,9	55	22	A185430390000	10,98
4	55	22	A185430400000	10,44
4,1	55	22	A185430410000	11,49
4,2	55	22	A185430420000	11,49
4,3	58	24	A185430430000	14,33
4,4	58	24	A185430440000	14,33
4,5	58	24	A185430450000	13,03
4,6	58	24	A185430460000	14,33
4,7	58	24	A185430470000	14,33
4,8	62	26	A185430480000	14,33
4,9	62	26	A185430490000	14,33
5	62	26	A185430500000	13,20
5,1	62	26	A185430510000	14,50
5,2	62	26	A185430520000	14,50
5,3	62	26	A185430530000	14,68
5,4	66	28	A185430540000	18,28
5,5	66	28	A185430550000	16,74
5,6	66	28	A185430560000	18,28
5,7	66	28	A185430570000	18,64
5,8	66	28	A185430580000	18,64
5,9	66	28	A185430590000	18,28
6	66	28	A185430600000	17,28
6,1	70	31	A185430610000	18,77
6,2	70	31	A185430620000	19,15
6,3	70	31	A185430630000	18,77

D	L	l	Code	Price
mm.	mm.	mm.		€
6,4	70	31	A185430640000	20,50
6,5	70	31	A185430650000	20,07
6,6	70	31	A185430660000	20,50
6,7	70	31	A185430670000	20,50
6,8	74	34	A185430680000	21,17
6,9	74	34	A185430690000	21,17
7	74	34	A185430700000	20,50
7,1	74	34	A185430710000	31,11
7,2	74	34	A185430720000	31,11
7,3	74	34	A185430730000	31,11
7,4	74	34	A185430740000	31,11
7,5	74	34	A185430750000	21,17
7,6	79	37	A185430760000	35,19
7,7	79	37	A185430770000	35,19
7,8	79	37	A185430780000	33,83
7,9	79	37	A185430790000	33,83
8	79	37	A185430800000	25,86
8,1	79	37	A185430810000	36,97
8,2	79	37	A185430820000	36,97
8,3	79	37	A185430830000	36,97
8,4	79	37	A185430840000	36,97
8,5	79	37	A185430850000	26,18
8,6	84	40	A185430860000	43,52
8,7	84	40	A185430870000	43,52
8,8	84	40	A185430880000	43,52
8,9	84	40	A185430890000	43,52
9	84	40	A185430900000	30,50
9,1	84	40	A185430910000	49,44
9,2	84	40	A185430920000	49,44
9,3	84	40	A185430930000	51,50
9,4	84	40	A185430940000	51,50
9,5	84	40	A185430950000	31,24
9,6	89	43	A185430960000	54,14
9,7	89	43	A185430970000	54,14
9,8	89	43	A185430980000	54,14
9,9	89	43	A185430990000	54,14
10	89	43	A185431000000	32,54
10,2	89	43	A185431020000	68,29
10,3	89	43	A185431030000	54,14
10,5	89	43	A185431050000	54,14
10,8	95	47	A185431080000	92,44
11	95	47	A185431100000	61,37
11,2	95	47	A185431120000	98,38
11,3	95	47	A185431130000	98,38

185.43 DIN 1897	Optimus series HSSCo 5%	Type SLZ 3 x D	TiAlN	Standar stub drills Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
11,5	95	47	**A185431150000**	**61,37**
12	102	51	**A185431200000**	**61,18**
12,2	102	51	**A185431220000**	**64,51**
12,5	102	51	**A185431250000**	**64,51**
12,8	102	51	**A185431280000**	**91,12**
13	102	51	**A185431300000**	**91,12**
13,3	107	54	**A185431330000**	**97,31**
13,5	107	54	**A185431350000**	**97,31**
13,8	107	54	**A185431380000**	**94,72**
14	107	54	**A185431400000**	**94,71**
14,5	111	56	**A185431450000**	**101,94**
14,8	111	56	**A185431480000**	**101,94**
15	111	56	**A185431500000**	**101,94**
15,3	111	56	**A185431530000**	**123,47**
15,5	115	58	**A185431550000**	**123,47**
15,8	115	58	**A185431580000**	**110,14**
16	115	58	**A185431600000**	**110,14**
16,5	115	58	**A185431650000**	**120,35**
17	119	60	**A185431700000**	**121,72**
17,5	123	60	**A185431750000**	**121,72**
18	123	62	**A185431800000**	**114,40**
18,5	127	64	**A185431850000**	**120,35**
19	127	64	**A185431900000**	**122,18**
19,5	131	66	**A185431950000**	**122,18**
20	131	66	**A185432000000**	**122,18**

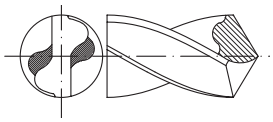
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	50	55	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
2	45	55	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
3	33	40	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
4	31,5	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
5	17	22,5	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
6	25	25	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
7	19	22,5	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
8	14,5	18	(B) (A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
10	6,5	8,5	(B) (A)	0,020	0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,140	0,160
13.1	50	62,5	(C) (A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
13.2	45	50	(C) (A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
16	70	70	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
17	55	55	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
18	70	70	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
19	52,5	52,5	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
20	45	45	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
24.1	75	100	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
24.2	55	80	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

185.44
DIN 1897



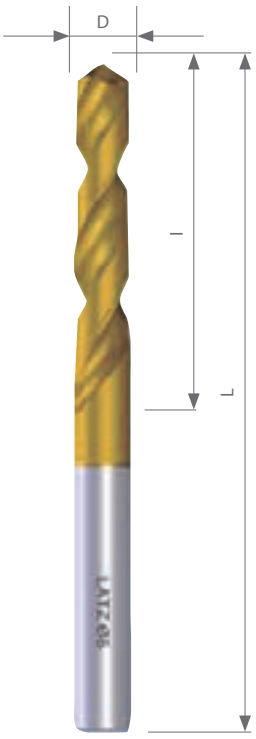
Optimus series HSSCo 5 % | Type SLZ 3 x D | TiN

Standar stub drills. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 3 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 100.40 and 100.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	38	12	A185440200000	6,04
2,1	38	12	A185440210000	6,73
2,2	40	13	A185440220000	6,73
2,3	40	13	A185440230000	6,73
2,4	43	14	A185440240000	6,92
2,5	43	14	A185440250000	6,04
2,6	43	14	A185440260000	6,73
2,7	46	16	A185440270000	6,92
2,8	46	16	A185440280000	6,92
2,9	46	16	A185440290000	6,92
3	46	16	A185440300000	6,67
3,1	49	18	A185440310000	7,47
3,2	49	18	A185440320000	7,47
3,3	49	18	A185440330000	7,47
3,4	52	20	A185440340000	7,17
3,5	52	20	A185440350000	7,53
3,6	52	20	A185440360000	8,46
3,7	52	20	A185440370000	8,46
3,8	55	22	A185440380000	8,46
3,9	55	22	A185440390000	8,46
4	55	22	A185440400000	7,84
4,1	55	22	A185440410000	8,83
4,2	55	22	A185440420000	8,83
4,3	58	24	A185440430000	10,81
4,4	58	24	A185440440000	10,81
4,5	58	24	A185440450000	9,63
4,6	58	24	A185440460000	10,81
4,7	58	24	A185440470000	10,81
4,8	62	26	A185440480000	10,81
4,9	62	26	A185440490000	10,81
5	62	26	A185440500000	9,94
5,1	62	26	A185440510000	10,81
5,2	62	26	A185440520000	10,81
5,3	62	26	A185440530000	11,12
5,4	66	28	A185440540000	13,58
5,5	66	28	A185440550000	12,71
5,6	66	28	A185440560000	13,58
5,7	66	28	A185440570000	13,88
5,8	66	28	A185440580000	13,88
5,9	66	28	A185440590000	13,58
6	66	28	A185440600000	13,09
6,1	70	31	A185440610000	14,13
6,2	70	31	A185440620000	14,38
6,3	70	31	A185440630000	14,13

D	L	l	Code	Price
mm.	mm.	mm.		€
6,4	70	31	A185440640000	15,50
6,5	70	31	A185440650000	15,18
6,6	70	31	A185440660000	15,50
6,7	70	31	A185440670000	15,50
6,8	74	34	A185440680000	15,98
6,9	74	34	A185440690000	15,98
7	74	34	A185440700000	15,50
7,1	74	34	A185440710000	23,59
7,2	74	34	A185440720000	23,59
7,3	74	34	A185440730000	23,59
7,4	74	34	A185440740000	23,59
7,5	74	34	A185440750000	15,98
7,6	79	37	A185440760000	26,61
7,7	79	37	A185440770000	26,61
7,8	79	37	A185440780000	25,49
7,9	79	37	A185440790000	25,49
8	79	37	A185440800000	19,51
8,1	79	37	A185440810000	27,91
8,2	79	37	A185440820000	27,91
8,3	79	37	A185440830000	27,91
8,4	79	37	A185440840000	27,91
8,5	79	37	A185440850000	19,81
8,6	84	40	A185440860000	32,91
8,7	84	40	A185440870000	32,91
8,8	84	40	A185440880000	32,91
8,9	84	40	A185440890000	32,91
9	84	40	A185440900000	23,09
9,1	84	40	A185440910000	37,42
9,2	84	40	A185440920000	37,42
9,3	84	40	A185440930000	38,90
9,4	84	40	A185440940000	38,90
9,5	84	40	A185440950000	25,25
9,6	89	43	A185440960000	40,87
9,7	89	43	A185440970000	40,87
9,8	89	43	A185440980000	40,87
9,9	89	43	A185440990000	40,87
10	89	43	A185441000000	24,64
10,2	89	43	A185441020000	51,55
10,3	89	43	A185441030000	40,87
10,5	89	43	A185441050000	40,87
10,8	95	47	A185441080000	46,30
11	95	47	A185441100000	46,30
11,2	95	47	A185441120000	46,30
11,3	95	47	A185441130000	46,30

185.44 DIN 1897	Optimus series HSSCo 5%	Type SLZ 3 x D	TiN	Standar stub drills Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
11,5	95	47	**A185441150000**	**46,30**
12	102	51	**A185441200000**	**46,30**
12,2	102	51	**A185441220000**	**51,96**
12,5	102	51	**A185441250000**	**48,84**
12,8	102	51	**A185441280000**	**68,97**
13	102	51	**A185441300000**	**68,97**
13,3	107	54	**A185441330000**	**73,72**
13,5	107	54	**A185441350000**	**73,72**
13,8	107	54	**A185441380000**	**71,55**
14	107	54	**A185441400000**	**71,55**
14,5	111	56	**A185441450000**	**77,18**
14,8	111	56	**A185441480000**	**77,18**
15	111	56	**A185441500000**	**77,18**
15,3	111	56	**A185441530000**	**93,29**
15,5	115	58	**A185441550000**	**93,29**
15,8	115	58	**A185441580000**	**83,29**
16	115	58	**A185441600000**	**83,29**
16,5	115	58	**A185441650000**	**98,38**
17	119	60	**A185441700000**	**99,76**
17,5	123	60	**A185441750000**	**99,76**
18	123	62	**A185441800000**	**93,81**
18,5	127	64	**A185441850000**	**98,84**
19	127	64	**A185441900000**	**100,21**
19,5	131	66	**A185441950000**	**103,42**
20	131	66	**A185442000000**	**100,21**

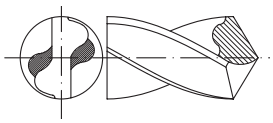
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	45	50	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
2	40	50	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
3	40	45	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
4	25	34	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	13,5	20	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
6	20	20	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
7	14	19	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
8	11	16	(B) (A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
10	5,5	7	(B) (A)	0,020	0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,140	0,160
13.1	40	50	(C) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
13.2	31,5	40	(C) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
16	70	70	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
17	56	56	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
18	70	70	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
19	45	45	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
20	33	40	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
21	70	70	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
24.1	80	100	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
24.2	55	75	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
25	45	45	(E)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

183.43
DIN 338



Optimus series HSSCo 5 %

Type SLZ 5 x D

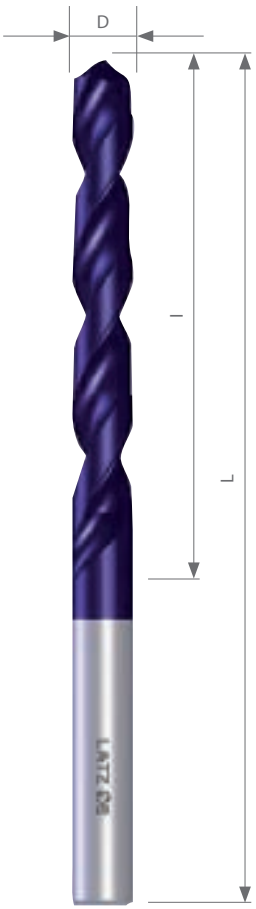
TiAlN

Jobber drills. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiAlN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiAlN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 5 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 180.40 and 105.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	49	24	A183430200000	10,56
2,1	49	24	A183430210000	11,20
2,2	53	27	A183430220000	11,20
2,3	53	27	A183430230000	11,20
2,4	57	30	A183430240000	11,61
2,5	57	30	A183430250000	10,50
2,6	57	30	A183430260000	10,74
2,7	61	33	A183430270000	11,61
2,8	61	33	A183430280000	11,61
2,9	61	33	A183430290000	11,61
3	61	33	A183430300000	10,84
3,1	65	36	A183430310000	12,15
3,2	65	36	A183430320000	12,15
3,3	65	36	A183430330000	12,15
3,4	70	39	A183430340000	13,05
3,5	70	39	A183430350000	13,07
3,6	70	39	A183430360000	13,69
3,7	70	39	A183430370000	13,69
3,8	75	43	A183430380000	13,69
3,9	75	43	A183430390000	13,69
4	75	43	A183430400000	13,57
4,1	75	43	A183430410000	15,78
4,2	75	43	A183430420000	15,78
4,3	80	47	A183430430000	16,95
4,4	80	47	A183430440000	16,95
4,5	80	47	A183430450000	14,98
4,6	80	47	A183430460000	16,95
4,7	80	47	A183430470000	16,95
4,8	86	52	A183430480000	16,95
4,9	86	52	A183430490000	16,95
5	86	52	A183430500000	15,56
5,1	86	52	A183430510000	18,10
5,2	86	52	A183430520000	18,10
5,3	86	52	A183430530000	17,57
5,4	93	57	A183430540000	23,47
5,5	93	57	A183430550000	20,26
5,6	93	57	A183430560000	23,47
5,7	93	57	A183430570000	23,87
5,8	93	57	A183430580000	23,87
5,9	93	57	A183430590000	23,30
6	93	57	A183430600000	21,92
6,1	101	63	A183430610000	24,94

D	L	l	Code	Price
mm.	mm.	mm.		€
6,2	101	63	A183430620000	25,63
6,3	101	63	A183430630000	24,94
6,4	101	63	A183430640000	27,11
6,5	101	63	A183430650000	23,05
6,6	101	63	A183430660000	27,11
6,7	101	63	A183430670000	27,11
6,8	109	69	A183430680000	28,22
6,9	109	69	A183430690000	28,22
7	109	69	A183430700000	27,11
7,1	109	69	A183430710000	34,27
7,2	109	69	A183430720000	34,27
7,3	109	69	A183430730000	34,27
7,4	109	69	A183430740000	34,27
7,5	109	69	A183430750000	29,34
7,6	117	75	A183430760000	38,94
7,7	117	75	A183430770000	38,94
7,8	117	75	A183430780000	37,60
7,9	117	75	A183430790000	37,60
8	117	75	A183430800000	36,07
8,1	117	75	A183430810000	41,89
8,2	117	75	A183430820000	41,89
8,3	117	75	A183430830000	41,89
8,4	117	75	A183430840000	41,89
8,5	117	75	A183430850000	36,66
8,6	125	81	A183430860000	51,96
8,7	125	81	A183430870000	51,96
8,8	125	81	A183430880000	51,96
8,9	125	81	A183430890000	51,96
9	125	81	A183430900000	45,44
9,1	125	81	A183430910000	59,60
9,2	125	81	A183430920000	59,60
9,3	125	81	A183430930000	59,73
9,4	125	81	A183430940000	59,73
9,5	125	81	A183430950000	41,40
9,6	133	87	A183430960000	64,28
9,7	133	87	A183430970000	64,28
9,8	133	87	A183430980000	64,28
9,9	133	87	A183430990000	64,28
10	133	87	A183431000000	51,18
10,2	133	87	A183431020000	78,25
10,3	133	87	A183431030000	65,21
10,5	133	87	A183431050000	65,21

183.43 DIN 338	Optimus series HSSCo 5%	Type SLZ 5 x D	TiAlN	Jobber drills Straight shank drills

D	L	I	Code	Price
mm.	mm.	mm.		€
10,8	142	94	**A183431080000**	**73,70**
11	142	94	**A183431100000**	**74,00**
11,2	142	94	**A183431120000**	**79,53**
11,3	142	94	**A183431130000**	**80,13**
11,5	142	94	**A183431150000**	**79,86**
12	151	101	**A183431200000**	**97,36**
12,2	151	101	**A183431220000**	**97,04**
12,5	151	101	**A183431250000**	**103,24**
12,8	151	101	**A183431280000**	**136,95**
13	151	101	**A183431300000**	**136,95**
13,3	160	108	**A183431330000**	**146,08**
13,5	160	108	**A183431350000**	**146,08**
13,8	160	108	**A183431380000**	**146,49**
14	160	108	**A183431400000**	**142,27**
14,5	169	114	**A183431450000**	**153,08**
14,8	169	114	**A183431480000**	**153,08**
15	169	114	**A183431500000**	**153,08**
15,3	178	120	**A183431530000**	**185,67**
15,5	178	120	**A183431550000**	**185,67**
15,8	178	120	**A183431580000**	**192,99**
16	178	120	**A183431600000**	**192,99**
16,5	184	125	**A183431650000**	**194,32**
17	184	125	**A183431700000**	**194,92**
17,5	191	130	**A183431750000**	**199,86**
18	191	130	**A183431800000**	**201,4**
18,5	198	135	**A183431850000**	**202,73**
19	198	135	**A183431900000**	**205,74**
19,5	205	140	**A183431950000**	**205,74**
20	205	140	**A183432000000**	**215,06**

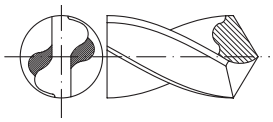
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
3	45	50	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
4	40	50	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
5	30	35	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
6	28	35	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
7	15	20	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
8	23	23	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
5	17	20	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
6	13	16	(B) (A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
7	6	7,5	(B) (A)	0,020	0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,140	0,160
8	45	55	(C) (A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
7	40	45	(C) (A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
5	63	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
6	50	50	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
7	63	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
8	47	47	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
10	40	40	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
13.1	70	90	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
13.2	50	70	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

183.44
DIN 338



Optimus series HSSCo 5 %

Type SLZ 5 x D

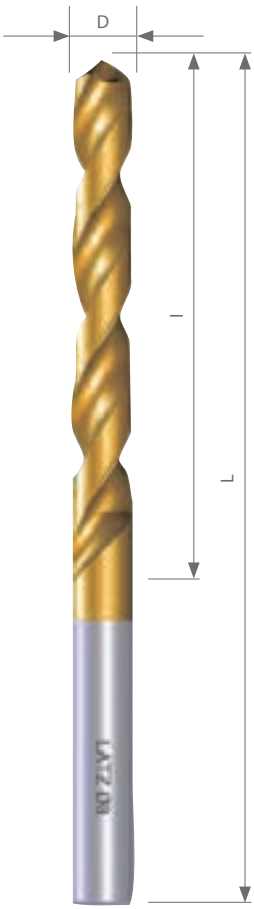
TiN

Jobber drills. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 5 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 180.40 and 105.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	49	24	A183440200000	8,00
2,1	49	24	A183440210000	8,48
2,2	53	27	A183440220000	8,48
2,3	53	27	A183440230000	8,48
2,4	57	30	A183440240000	8,67
2,5	57	30	A183440250000	7,72
2,6	57	30	A183440260000	8,13
2,7	61	33	A183440270000	8,67
2,8	61	33	A183440280000	8,67
2,9	61	33	A183440290000	8,67
3	61	33	A183440300000	8,13
3,1	65	36	A183440310000	9,42
3,2	65	36	A183440320000	9,42
3,3	65	36	A183440330000	9,42
3,4	70	39	A183440340000	9,66
3,5	70	39	A183440350000	9,78
3,6	70	39	A183440360000	10,54
3,7	70	39	A183440370000	10,54
3,8	75	43	A183440380000	10,54
3,9	75	43	A183440390000	10,54
4	75	43	A183440400000	10,19
4,1	75	43	A183440410000	12,13
4,2	75	43	A183440420000	12,13
4,3	80	47	A183440430000	12,78
4,4	80	47	A183440440000	12,78
4,5	80	47	A183440450000	11,07
4,6	80	47	A183440460000	12,78
4,7	80	47	A183440470000	12,78
4,8	86	52	A183440480000	12,78
4,9	86	52	A183440490000	12,78
5	86	52	A183440500000	11,72
5,1	86	52	A183440510000	13,49
5,2	86	52	A183440520000	13,49
5,3	86	52	A183440530000	13,31
5,4	93	57	A183440540000	17,44
5,5	93	57	A183440550000	15,38
5,6	93	57	A183440560000	17,44
5,7	93	57	A183440570000	17,78
5,8	93	57	A183440580000	17,78
5,9	93	57	A183440590000	17,31
6	93	57	A183440600000	16,61
6,1	101	63	A183440610000	18,78
6,2	101	63	A183440620000	19,25
6,3	101	63	A183440630000	18,78

D	L	l	Code	Price
mm.	mm.	mm.		€
6,4	101	63	A183440640000	20,49
6,5	101	63	A183440650000	17,44
6,6	101	63	A183440660000	20,49
6,7	101	63	A183440670000	20,49
6,8	109	69	A183440680000	21,31
6,9	109	69	A183440690000	21,31
7	109	69	A183440700000	20,49
7,1	109	69	A183440710000	25,98
7,2	109	69	A183440720000	25,98
7,3	109	69	A183440730000	25,98
7,4	109	69	A183440740000	25,98
7,5	109	69	A183440750000	22,15
7,6	117	75	A183440760000	29,45
7,7	117	75	A183440770000	29,45
7,8	117	75	A183440780000	28,33
7,9	117	75	A183440790000	28,33
8	117	75	A183440800000	27,21
8,1	117	75	A183440810000	31,63
8,2	117	75	A183440820000	31,63
8,3	117	75	A183440830000	31,63
8,4	117	75	A183440840000	31,63
8,5	117	75	A183440850000	27,74
8,6	125	81	A183440860000	39,29
8,7	125	81	A183440870000	39,29
8,8	125	81	A183440880000	39,29
8,9	125	81	A183440890000	39,29
9	125	81	A183440900000	34,40
9,1	125	81	A183440910000	45,11
9,2	125	81	A183440920000	45,11
9,3	125	81	A183440930000	45,11
9,4	125	81	A183440940000	45,11
9,5	125	81	A183440950000	33,46
9,6	133	87	A183440960000	48,53
9,7	133	87	A183440970000	48,53
9,8	133	87	A183440980000	48,53
9,9	133	87	A183440990000	48,53
10	133	87	A183441000000	38,75
10,2	133	87	A183441020000	59,07
10,3	133	87	A183441030000	49,23
10,5	133	87	A183441050000	49,23
10,8	142	94	A183441080000	55,83
11	142	94	A183441100000	55,83
11,2	142	94	A183441120000	60,25
11,3	142	94	A183441130000	60,25

183.44 DIN 338	Optimus series HSSCo 5%	Type SLZ 5 x D	TiN	Jobber drills Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
11,5	142	94	**A183441150000**	**60,25**
12	151	101	**A183441200000**	**73,68**
12,2	151	101	**A183441220000**	**78,16**
12,5	151	101	**A183441250000**	**78,16**
12,8	151	101	**A183441280000**	**103,66**
13	151	101	**A183441300000**	**103,66**
13,3	160	108	**A183441330000**	**110,66**
13,5	160	108	**A183441350000**	**110,66**
13,8	160	108	**A183441380000**	**110,66**
14	160	108	**A183441400000**	**107,48**
14,5	169	114	**A183441450000**	**115,90**
14,8	169	114	**A183441480000**	**115,90**
15	169	114	**A183441500000**	**115,90**
15,3	178	120	**A183441530000**	**140,28**
15,5	178	120	**A183441550000**	**140,28**
15,8	178	120	**A183441580000**	**145,95**
16	178	120	**A183441600000**	**145,95**
16,5	184	125	**A183441650000**	**158,85**
17	184	125	**A183441700000**	**159,75**
17,5	191	130	**A183441750000**	**163,80**
18	191	130	**A183441800000**	**165,15**
18,5	198	135	**A183441850000**	**166,50**
19	198	135	**A183441900000**	**168,75**
19,5	205	140	**A183441950000**	**174,15**
20	205	140	**A183442000000**	**176,40**

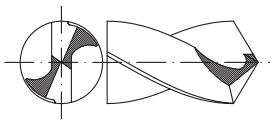
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
4	40	45	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
5	35	45	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
5	35	40	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
6	23	30	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
7	12	17	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
8	18	18	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	12,5	17	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
6	10	14	(B) (A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
7	5	6,5	(B) (A)	0,020	0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,140	0,160
4	35	45	(C) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
5	28	35	(C) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
8	63	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
7	50	50	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
5	63	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
6	40	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
7	30	35	(A) (B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
8	63	63	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
10	70	90	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
13.1	50	70	(A)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630
13.2	40	40	(E)	0,080	0,100	0,130	0,160	0,200	0,250	0,280	0,310	0,400	0,500	0,560	0,630

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

181.40
DIN 338



Optimus series
HSSCo 5 %

Type NG
5 x D

Jobber drills. Heavy duty.
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	Light
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

Details and applications

The high strength at elevated temperatures of the cobalt high speed steel HSSCo and the special design for heavy duty applications provide this drill with exceptional qualities for the drilling of extra hard steels, forgings and other highly resistant materials (with reinforced web and pointed in the same way as crankshaft drills). Use to drill: Titanium and titanium alloys-Refines alloy steels over 900 N/mm^2. Stainless austenitic, nickel-chrome, heat resisting steels- Vanadium stainless steels-hastelloy, Inconel, nimonic and other special alloy steels used in the aircraft industry.

D	L	l	Code	Price
mm.	mm.	mm.		€
1	34	12	A181400100000	2,95
1,1	36	14	A181400110000	3,64
1,2	38	16	A181400120000	3,30
1,25	38	16	A181400125000	3,97
1,3	38	16	A181400130000	3,64
1,4	40	18	A181400140000	3,37
1,5	40	18	A181400150000	2,62
1,6	43	20	A181400160000	3,64
1,7	43	20	A181400170000	3,64
1,75	46	22	A181400175000	4,71
1,8	46	22	A181400180000	3,64
1,9	46	22	A181400190000	3,77
2	49	24	A181400200000	2,69
2,1	49	24	A181400210000	4,04
2,2	53	27	A181400220000	4,04
2,25	53	27	A181400225000	4,58
2,3	53	27	A181400230000	4,04
2,4	57	30	A181400240000	3,49
2,5	57	30	A181400250000	2,69
2,6	57	30	A181400260000	3,84
2,7	61	33	A181400270000	3,84
2,75	61	33	A181400275000	4,51
2,8	61	33	A181400280000	3,97
2,9	61	33	A181400290000	3,84
3	61	33	A181400300000	2,69
3,1	65	36	A181400310000	4,04
3,2	65	36	A181400320000	3,77
3,25	65	36	A181400325000	4,38
3,3	65	36	A181400330000	3,90
3,4	70	39	A181400340000	4,04
3,5	70	39	A181400350000	3,03
3,6	70	39	A181400360000	4,58
3,7	70	39	A181400370000	4,23
3,75	70	39	A181400375000	5,51
3,8	75	43	A181400380000	4,58
3,9	75	43	A181400390000	4,58
4	75	43	A181400400000	3,49
4,1	75	43	A181400410000	5,05
4,2	75	43	A181400420000	4,77
4,25	75	43	A181400425000	5,05
4,3	80	47	A181400430000	5,05
4,4	80	47	A181400440000	5,05
4,5	80	47	A181400450000	3,90
4,6	80	47	A181400460000	6,26
4,7	80	47	A181400470000	6,20
4,75	80	47	A181400475000	7,81
4,8	86	52	A181400480000	5,66
4,9	86	52	A181400490000	5,59
5	86	52	A181400500000	4,31
5,1	86	52	A181400510000	7,00
5,2	86	52	A181400520000	6,05
5,25	86	52	A181400525000	8,62

D	L	l	Code	Price
mm.	mm.	mm.		€
5,3	86	52	A181400530000	7,13
5,4	93	57	A181400540000	7,00
5,5	93	57	A181400550000	5,12
5,6	93	57	A181400560000	7,81
5,7	93	57	A181400570000	8,15
5,75	93	57	A181400575000	9,43
5,8	93	57	A181400580000	8,15
5,9	93	57	A181400590000	8,15
6	93	57	A181400600000	5,66
6,1	101	63	A181400610000	9,97
6,2	101	63	A181400620000	9,97
6,25	101	63	A181400625000	11,51
6,3	101	63	A181400630000	9,97
6,4	101	63	A181400640000	9,97
6,5	101	63	A181400650000	7,21
6,6	101	63	A181400660000	10,90
6,7	101	63	A181400670000	11,18
6,75	109	69	A181400675000	12,92
6,8	109	69	A181400680000	10,90
6,9	109	69	A181400690000	11,18
7	109	69	A181400700000	7,75
7,1	109	69	A181400710000	12,66
7,2	109	69	A181400720000	12,38
7,25	109	69	A181400725000	15,41
7,3	109	69	A181400730000	12,38
7,4	109	69	A181400740000	12,38
7,5	109	69	A181400750000	9,56
7,6	117	75	A181400760000	13,54
7,7	117	75	A181400770000	13,54
7,75	117	75	A181400775000	16,15
7,8	117	75	A181400780000	14,13
7,9	117	75	A181400790000	13,54
8	117	75	A181400800000	10,90
8,1	117	75	A181400810000	16,89
8,2	117	75	A181400820000	16,89
8,25	117	75	A181400825000	18,91
8,3	117	75	A181400830000	17,23
8,4	117	75	A181400840000	17,23
8,5	117	75	A181400850000	11,79
8,6	125	81	A181400860000	18,51
8,7	125	81	A181400870000	18,51
8,75	125	81	A181400875000	22,89
8,8	125	81	A181400880000	19,32
8,9	125	81	A181400890000	19,32
9	125	81	A181400900000	12,86
9,1	125	81	A181400910000	20,46
9,2	125	81	A181400920000	20,46
9,25	125	81	A181400925000	23,56
9,3	125	81	A181400930000	21,41
9,4	125	81	A181400940000	21,41
9,5	125	81	A181400950000	15,56
9,6	133	87	A181400960000	22,55

181.40
DIN 338

Optimus series
HSSCo 5%

Type NG
5 x D

Jobber drills. Heavy duty
Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
9,7	133	87	**A181400970000**	**22,55**
9,75	133	87	**A181400975000**	**25,72**
9,8	133	87	**A181400980000**	**23,43**
9,9	133	87	**A181400990000**	**26,72**
10	133	87	**A181401000000**	**17,23**
10,2	133	87	**A181401020000**	**23,02**
10,25	133	87	**A181401025000**	**25,85**
10,5	133	87	**A181401050000**	**18,65**
10,75	142	94	**A181401075000**	**25,72**
11	142	94	**A181401100000**	**20,87**
11,25	142	94	**A181401125000**	**34,87**
11,5	142	94	**A181401150000**	**23,02**
11,75	142	94	**A181401175000**	**35,20**
12	151	101	**A181401200000**	**23,90**
12,5	151	101	**A181401250000**	**27,81**
13	151	101	**A181401300000**	**29,35**
13,5	160	108	**A181401350000**	**40,32**
14	160	108	**A181401400000**	**44,43**
14,25	169	114	**A181401425000**	**62,61**
14,5	169	114	**A181401450000**	**52,64**
15	169	114	**A181401500000**	**56,55**
15,5	178	120	**A181401550000**	**69,34**
16	178	120	**A181401600000**	**70,35**

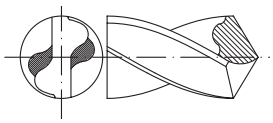
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
5	14	14	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
6	14	14	(B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
7	8	12,5	(B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
8	6,3	10	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
10	4	6,3	(B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180
17	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

184.43
DIN 340



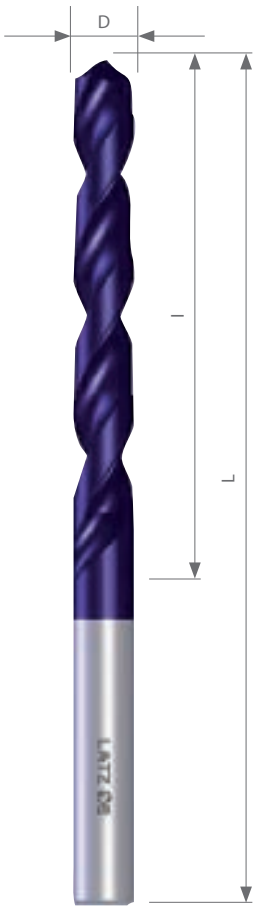
Optimus series HSSCo 5 % | Type SLZ 10 x D | TiAlN

Taper length. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiAlN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 10 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 182.40 and 115.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	85	56	A184430200000	30,62
2,1	85	56	A184430210000	32,24
2,2	90	59	A184430220000	32,31
2,3	90	59	A184430230000	32,01
2,4	95	62	A184430240000	32,54
2,5	95	62	A184430250000	30,75
2,6	95	62	A184430260000	32,62
2,7	100	66	A184430270000	34,02
2,8	100	66	A184430280000	34,78
2,9	100	66	A184430290000	34,60
3	100	66	A184430300000	31,76
3,1	106	69	A184430310000	36,00
3,2	106	69	A184430320000	34,69
3,3	106	69	A184430330000	36,42
3,4	112	73	A184430340000	35,63
3,5	112	73	A184430350000	39,29
3,6	112	73	A184430360000	37,40
3,7	112	73	A184430370000	38,66
3,8	119	78	A184430380000	39,54
3,9	119	78	A184430390000	43,54
4	119	78	A184430400000	34,57
4,1	119	78	A184430410000	39,57
4,2	119	78	A184430420000	37,30
4,3	126	82	A184430430000	41,79
4,4	126	82	A184430440000	41,69
4,5	126	82	A184430450000	38,88
4,6	126	82	A184430460000	41,94
4,7	126	82	A184430470000	41,86
4,8	132	87	A184430480000	41,67
4,9	132	87	A184430490000	43,62
5	132	87	A184430500000	39,98
5,1	132	87	A184430510000	43,64
5,2	132	87	A184430520000	43,31
5,3	132	87	A184430530000	43,56
5,4	139	91	A184430540000	45,53
5,5	139	91	A184430550000	43,63
5,6	139	91	A184430560000	43,38
5,7	139	91	A184430570000	45,58
5,8	139	91	A184430580000	45,52
5,9	139	91	A184430590000	45,96
6	139	91	A184430600000	47,61
6,1	148	97	A184430610000	60,39
6,2	148	97	A184430620000	62,60
6,3	148	97	A184430630000	66,45

D	L	l	Code	Price
mm.	mm.	mm.		€
6,4	148	97	A184430640000	67,66
6,5	148	97	A184430650000	62,35
6,6	148	97	A184430660000	70,45
6,7	148	97	A184430670000	69,91
6,8	156	102	A184430680000	74,02
6,9	156	102	A184430690000	71,96
7	156	102	A184430700000	62,64
7,1	156	102	A184430710000	85,77
7,2	156	102	A184430720000	85,16
7,3	156	102	A184430730000	85,44
7,4	156	102	A184430740000	85,02
7,5	156	102	A184430750000	77,19
7,6	165	109	A184430760000	81,50
7,7	165	109	A184430770000	81,86
7,8	165	109	A184430780000	81,29
7,9	165	109	A184430790000	82,40
8	165	109	A184430800000	79,11
8,1	165	109	A184430810000	98,47
8,2	165	109	A184430820000	98,14
8,3	165	109	A184430830000	111,96
8,4	165	109	A184430840000	111,53
8,5	165	109	A184430850000	85,47
8,6	175	115	A184430860000	116,16
8,7	175	115	A184430870000	117,99
8,8	175	115	A184430880000	117,42
8,9	175	115	A184430890000	121,62
9	175	115	A184430900000	89,66
9,1	175	115	A184430910000	121,54
9,2	175	115	A184430920000	133,18
9,3	175	115	A184430930000	132,90
9,4	175	115	A184430940000	133,10
9,5	175	115	A184430950000	101,32
9,6	184	121	A184430960000	153,40
9,7	184	121	A184430970000	161,87
9,8	184	121	A184430980000	151,37
9,9	184	121	A184430990000	150,30
10	184	121	A184431000000	105,52
10,2	184	121	A184431020000	143,14
10,5	184	121	A184431050000	134,50
11	195	128	A184431100000	154,17
11,5	195	128	A184431150000	167,40
12	205	134	A184431200000	188,24

184.43 DIN 340	Optimus series HSSCo 5%	Type SLZ 10 x D	TiAlN	Taper length. High performance Straight shank drills

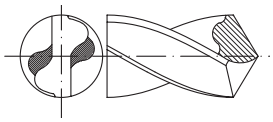
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	36	40	(A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567
2	32	40	(A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567
3	24	28	(A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
4	22,5	28	(A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
5	12	16	(A) (B)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
6	18,5	18,5	(A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
7	13,5	16	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
8	10,5	13	(B) (A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
10	4,5	6	(B) (A)	0,018	0,027	0,027	0,036	0,045	0,054	0,054	0,072	0,090	0,108	0,126	0,144
13.1	36	44	(C) (A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567
13.2	32	36	(C) (A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567
16	50	50	(A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
17	40	40	(A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
18	50	50	(A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
19	35	38	(A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
20	32	32	(A) (B)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
24.1	56	72	(A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567
24.2	40	56	(A)	0,072	0,090	0,117	0,144	0,180	0,225	0,252	0,279	0,360	0,450	0,504	0,567

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

184.44
DIN 340



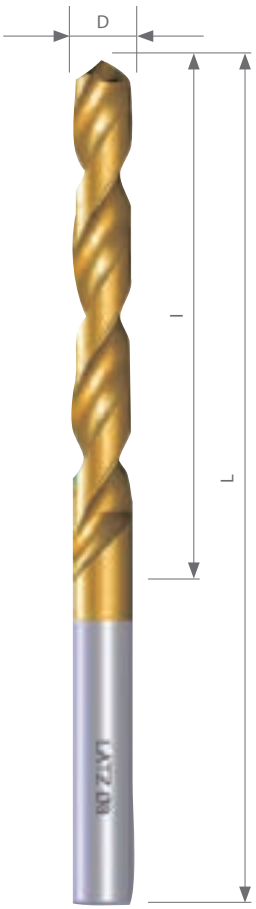
Optimus series HSSCo 5 % | Type SLZ 10 x D | TiN

Taper length. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring and TiN coating, is specially appropriate for drilling deeper holes in difficult conditions where chip removal is difficult and swarf creates problems of coolant reaching the drill point, and in those cases where the depth to drill is less than 10 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 182.40 and 115.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	85	56	A184440200000	23,55
2,1	85	56	A184440210000	24,80
2,2	90	59	A184440220000	24,85
2,3	90	59	A184440230000	24,62
2,4	95	62	A184440240000	25,03
2,5	95	62	A184440250000	23,66
2,6	95	62	A184440260000	25,09
2,7	100	66	A184440270000	26,17
2,8	100	66	A184440280000	26,76
2,9	100	66	A184440290000	26,61
3	100	66	A184440300000	24,43
3,1	106	69	A184440310000	27,70
3,2	106	69	A184440320000	26,68
3,3	106	69	A184440330000	28,01
3,4	112	73	A184440340000	27,41
3,5	112	73	A184440350000	30,22
3,6	112	73	A184440360000	28,77
3,7	112	73	A184440370000	29,74
3,8	119	78	A184440380000	30,42
3,9	119	78	A184440390000	33,49
4	119	78	A184440400000	26,59
4,1	119	78	A184440410000	30,44
4,2	119	78	A184440420000	28,69
4,3	126	82	A184440430000	32,14
4,4	126	82	A184440440000	32,07
4,5	126	82	A184440450000	29,91
4,6	126	82	A184440460000	32,26
4,7	126	82	A184440470000	32,20
4,8	132	87	A184440480000	32,05
4,9	132	87	A184440490000	33,55
5	132	87	A184440500000	30,75
5,1	132	87	A184440510000	33,57
5,2	132	87	A184440520000	33,32
5,3	132	87	A184440530000	33,51
5,4	139	91	A184440540000	35,02
5,5	139	91	A184440550000	33,56
5,6	139	91	A184440560000	33,37
5,7	139	91	A184440570000	35,06
5,8	139	91	A184440580000	35,01
5,9	139	91	A184440590000	35,35
6	139	91	A184440600000	36,62
6,1	148	97	A184440610000	46,45
6,2	148	97	A184440620000	48,16
6,3	148	97	A184440630000	51,12

D	L	l	Code	Price
mm.	mm.	mm.		€
6,4	148	97	A184440640000	52,04
6,5	148	97	A184440650000	47,96
6,6	148	97	A184440660000	54,20
6,7	148	97	A184440670000	53,78
6,8	156	102	A184440680000	56,94
6,9	156	102	A184440690000	55,35
7	156	102	A184440700000	48,19
7,1	156	102	A184440710000	65,97
7,2	156	102	A184440720000	65,51
7,3	156	102	A184440730000	65,73
7,4	156	102	A184440740000	65,40
7,5	156	102	A184440750000	59,38
7,6	165	109	A184440760000	62,69
7,7	165	109	A184440770000	62,97
7,8	165	109	A184440780000	62,53
7,9	165	109	A184440790000	63,38
8	165	109	A184440800000	60,86
8,1	165	109	A184440810000	75,74
8,2	165	109	A184440820000	75,50
8,3	165	109	A184440830000	86,12
8,4	165	109	A184440840000	85,79
8,5	165	109	A184440850000	65,74
8,6	175	115	A184440860000	89,35
8,7	175	115	A184440870000	90,76
8,8	175	115	A184440880000	90,32
8,9	175	115	A184440890000	93,55
9	175	115	A184440900000	68,97
9,1	175	115	A184440910000	93,49
9,2	175	115	A184440920000	102,45
9,3	175	115	A184440930000	102,23
9,4	175	115	A184440940000	102,39
9,5	175	115	A184440950000	77,94
9,6	184	121	A184440960000	118,00
9,7	184	121	A184440970000	124,51
9,8	184	121	A184440980000	116,44
9,9	184	121	A184440990000	115,61
10	184	121	A184441000000	81,17
10,2	184	121	A184441020000	110,10
10,5	184	121	A184441050000	103,46
11	195	128	A184441100000	118,59
11,5	195	128	A184441150000	128,77
12	205	134	A184441200000	144,80

184.44 DIN 340	Optimus series HSSCo 5%	Type SLZ 10 x D	TiN	Taper length. High performance Straight shank drills

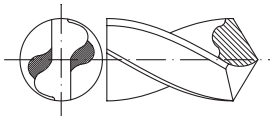
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	32	36	(A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
2	28	36	(A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
3	28	32	(A)	0,07	0,09	0,12	0,14	0,18	0,23	0,25	0,28	0,36	0,45	0,50	0,57
4	18	24	(A)	0,04	0,05	0,05	0,07	0,09	0,11	0,13	0,14	0,18	0,23	0,25	0,28
5	9,5	13,5	(A) (B)	0,03	0,03	0,04	0,05	0,05	0,07	0,07	0,09	0,12	0,14	0,16	0,18
6	14	15	(A)	0,04	0,05	0,05	0,07	0,09	0,11	0,13	0,14	0,18	0,23	0,25	0,28
7	10	14	(A)	0,04	0,05	0,05	0,07	0,09	0,11	0,13	0,14	0,18	0,23	0,25	0,28
8	8	11	(B) (A)	0,03	0,04	0,05	0,05	0,07	0,09	0,09	0,12	0,14	0,18	0,20	0,23
10	4	5,2	(B) (A)	0,02	0,03	0,03	0,04	0,05	0,05	0,05	0,07	0,09	0,11	0,13	0,14
13.1	28	36	(C) (A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
13.2	22	28	(C) (A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
16	50	50	(A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
17	40	40	(A)	0,05	0,05	0,07	0,09	0,12	0,14	0,16	0,18	0,23	0,28	0,32	0,36
18	50	50	(A)	0,05	0,07	0,09	0,12	0,14	0,18	0,20	0,23	0,28	0,36	0,41	0,45
19	32	32	(A)	0,05	0,05	0,07	0,09	0,12	0,14	0,16	0,18	0,23	0,28	0,32	0,36
20	24	28	(A) (B)	0,04	0,05	0,05	0,07	0,09	0,11	0,13	0,14	0,18	0,23	0,25	0,28
21	50	50	(A)	0,07	0,09	0,12	0,14	0,18	0,23	0,25	0,28	0,36	0,45	0,50	0,57
24.1	56	72	(A)	0,07	0,09	0,12	0,14	0,18	0,23	0,25	0,28	0,36	0,45	0,50	0,57
24.2	40	56	(A)	0,07	0,09	0,12	0,14	0,18	0,23	0,25	0,28	0,36	0,45	0,50	0,57
25	32	32	(E)	0,07	0,09	0,12	0,14	0,18	0,23	0,25	0,28	0,36	0,45	0,50	0,57

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

124.40
DIN 1869/1

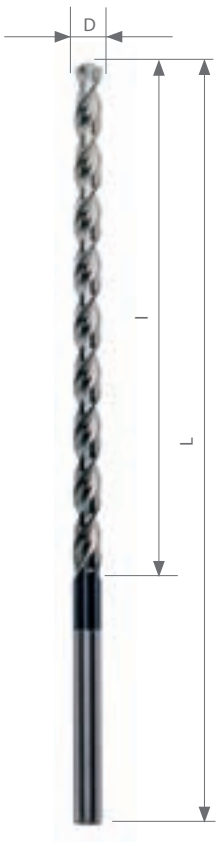


Optimus series | Type SLZ
HSSCo 5 % | 15 x D

Extra length drills. Series 1
High performance
Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring, nitrided phase and polished slot, is specially appropriate for continuous drilling of extremely deep holes where chip removal and lubrication of the edge make working difficult, for drilling no more than 15 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 121.30 and 124.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	125	85	**A124400200000**	**15,71**
2,5	140	95	**A124400250000**	**15,64**
3	150	100	**A124400300000**	**17,78**
3,5	165	115	**A124400350000**	**18,02**
4	175	120	**A124400400000**	**18,02**
4,5	185	125	**A124400450000**	**21,07**
5	195	135	**A124400500000**	**28,33**
5,5	205	140	**A124400550000**	**22,60**
6	205	140	**A124400600000**	**22,57**
6,5	215	150	**A124400650000**	**27,97**
7	225	155	**A124400700000**	**34,70**
7,5	225	155	**A124400750000**	**38,31**
8	240	165	**A124400800000**	**39,07**
8,5	240	165	**A124400850000**	**53,02**
9	250	174	**A124400900000**	**56,57**
9,5	250	175	**A124400950000**	**65,50**
10	265	185	**A124401000000**	**59,38**
10,5	265	185	**A124401050000**	**100,36**
11	280	195	**A124401100000**	**75,24**
12	295	205	**A124401200000**	**85,02**

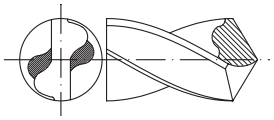
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	22	28	(A)	0,040	0,048	0,064	0,080	0,104	0,128	0,144	0,160	0,200	0,248	0,280
2	21	28	(A)	0,040	0,048	0,064	0,080	0,104	0,128	0,144	0,160	0,200	0,248	0,280
3	17,5	21	(A)	0,040	0,048	0,064	0,080	0,104	0,128	0,144	0,160	0,200	0,248	0,280
4	10,5	14	(A)	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200	0,224
5	7	9	(B)	0,024	0,024	0,032	0,040	0,048	0,064	0,064	0,080	0,104	0,128	0,144
6	10	10	(B)	0,024	0,032	0,040	0,048	0,064	0,080	0,080	0,104	0,128	0,160	0,176
7	5	9	(B)	0,024	0,032	0,040	0,048	0,064	0,080	0,080	0,104	0,128	0,160	0,176
8	4,5	7	(B)	0,024	0,024	0,032	0,040	0,048	0,064	0,064	0,080	0,104	0,128	0,144
10	3	4,5	(B)	0,024	0,024	0,032	0,040	0,048	0,064	0,064	0,080	0,104	0,128	0,144
13.1	21	25	(A)	0,040	0,048	0,064	0,080	0,104	0,128	0,144	0,160	0,200	0,248	0,280
13.2	15	22,5	(A)	0,048	0,064	0,080	0,104	0,128	0,160	0,176	0,200	0,248	0,320	0,360
17	17,5	28	(A)	0,040	0,048	0,064	0,080	0,104	0,128	0,144	0,160	0,200	0,248	0,280

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

125.40
DIN 1869/2



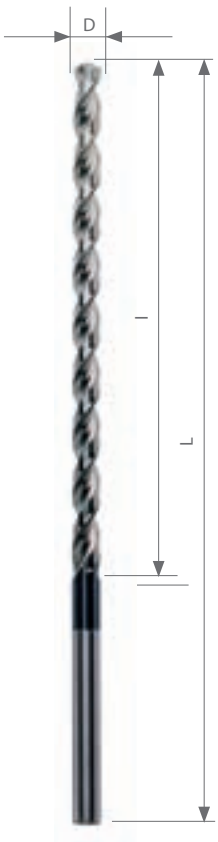
Optimus series | Type SLZ
HSSCo 5 % | 20 x D

Extra length drills. Series 2. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring, nitrided phase and polished slot, is specially appropriate for continuous drilling of extremely deep holes where chip removal and lubrication of the edge make working difficult, for drilling no more than 20 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 122.30 and 125.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
3	190	130	**A125400300000**	**19,77**
3,5	210	145	**A125400350000**	**20,50**
4	220	150	**A125400400000**	**20,50**
4,5	235	160	**A125400450000**	**24,18**
5	245	170	**A125400500000**	**30,12**
5,5	260	180	**A125400550000**	**28,21**
6	260	180	**A125400600000**	**28,19**
6,5	275	190	**A125400650000**	**32,68**
7	290	200	**A125400700000**	**38,30**
7,5	290	200	**A125400750000**	**44,07**
8	305	210	**A125400800000**	**43,83**
8,5	305	210	**A125400850000**	**63,16**
9	320	220	**A125400900000**	**63,61**
9,5	320	220	**A125400950000**	**74,96**
10	340	235	**A125401000000**	**68,48**
10,5	340	235	**A125401050000**	**104,44**
11	365	250	**A125401100000**	**86,10**
12	375	260	**A125401200000**	**97,21**

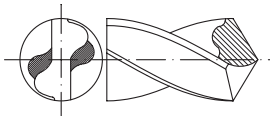
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	22	28	(A)	0,04	0,04	0,06	0,07	0,09	0,11	0,13	0,14	0,18	0,22	0,25
2	21	28	(A)	0,04	0,04	0,06	0,07	0,09	0,11	0,13	0,14	0,18	0,22	0,25
3	17,5	21	(A)	0,04	0,04	0,06	0,07	0,09	0,11	0,13	0,14	0,18	0,22	0,25
4	10,5	14	(A)	0,03	0,04	0,04	0,06	0,07	0,08	0,10	0,11	0,14	0,18	0,20
5	7	9	(B)	0,02	0,02	0,03	0,04	0,04	0,06	0,06	0,07	0,09	0,11	0,13
6	10	10	(B)	0,02	0,03	0,04	0,04	0,06	0,07	0,07	0,09	0,11	0,14	0,15
7	5	9	(B)	0,02	0,03	0,04	0,04	0,06	0,07	0,07	0,09	0,11	0,14	0,15
8	4,5	7	(B)	0,02	0,02	0,03	0,04	0,04	0,06	0,06	0,07	0,09	0,11	0,13
10	3	4,5	(B)	0,02	0,02	0,03	0,04	0,04	0,06	0,06	0,07	0,09	0,11	0,13
13.1	21	25	(A)	0,04	0,04	0,06	0,07	0,09	0,11	0,13	0,14	0,18	0,22	0,25
13.2	15	22,5	(A)	0,04	0,06	0,07	0,09	0,11	0,14	0,15	0,18	0,22	0,28	0,32
17	17,5	28	(A)	0,04	0,04	0,06	0,07	0,09	0,11	0,13	0,14	0,18	0,22	0,25

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

126.40
DIN 1869/3



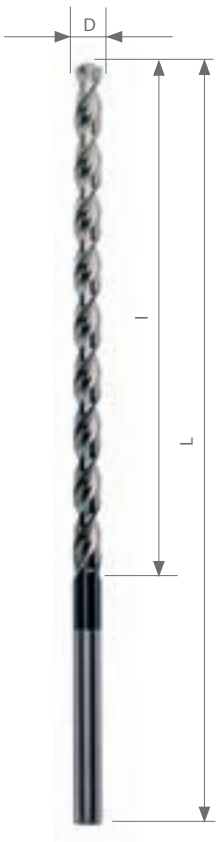
Optimus series | Type SLZ
HSSCo 5 % | 30 x D

Extra length drills. Series 3. High performance

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web type U
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

This robust drill with reinforced web and wide flutes, form type SLZ, self-centring, nitrided phase and polished slot, is specially appropriate for continuous drilling of extremely deep holes where chip removal and lubrication of the edge make working difficult, for drilling no more than 30 x D. This is our highest performance drill, ideal for intensive working processes. We also have more economic families such as series 123.30 and 126.30. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
3,5	265	180	**A126400350000**	**24,50**
4	280	190	**A126400400000**	**24,50**
4,5	295	200	**A126400450000**	**29,79**
5	315	210	**A126400500000**	**32,50**
5,5	330	225	**A126400550000**	**32,01**
6	330	225	**A126400600000**	**32,05**
6,5	350	235	**A126400650000**	**37,74**
7	370	250	**A126400700000**	**47,96**
7,5	370	250	**A126400750000**	**53,91**
8	390	265	**A126400800000**	**55,22**
8,5	390	265	**A126400850000**	**71,21**
9	410	280	**A126400900000**	**75,75**
9,5	410	280	**A126400950000**	**88,52**
10	430	295	**A126401000000**	**84,00**
10,5	430	295	**A126401050000**	**107,79**
11	455	310	**A126401100000**	**94,17**
12	480	330	**A126401200000**	**108,79**

Cutting conditions and recommended material

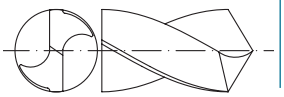
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	22	28	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210
2	21	28	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210
3	17,5	21	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210
4	10,5	14	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168
5	7	9	(B)	0,018	0,018	0,024	0,030	0,036	0,048	0,048	0,060	0,078	0,096	0,108
6	10	10	(B)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132
7	5	9	(B)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132
8	4,5	7	(B)	0,018	0,018	0,024	0,030	0,036	0,048	0,048	0,060	0,078	0,096	0,108
10	3	4,5	(B)	0,018	0,018	0,024	0,030	0,036	0,048	0,048	0,060	0,078	0,096	0,108
13.1	21	25	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210
13.2	15	22,5	(A)	0,036	0,048	0,060	0,078	0,096	0,120	0,132	0,150	0,186	0,240	0,270
17	17,5	28	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

100.30
DIN 1897

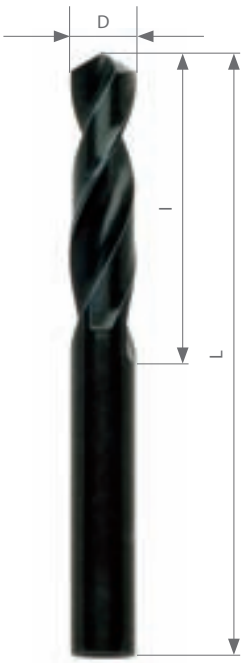
Classic series HSS | Type N 3 x D



Standard stub drills
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)



Details and applications

This drill offers the maximum stiffness when working with hand drilling machines in the drilling of thin sections, sheet metal and in general in machining with automatic and capstan lathes: SHORT HOLES DRILLING. Excellent production drill for a wide range of applications. In this sizes this is our most economic family. For a higher performance we suggest our Optimus families 185.43 and 185.44. Use to drill: Steel and cast steel, alloyed and non-alloyed, up to 900 N/mm^2- Grey cast iron-Malleable cast iron-Pressure casting-German silver-Graphite-Phosphor bronze for bearings-Bronze alloys of aluminium, lead, magnesium or silicon-Soft brass (≥60% Cu) continuous swarf-Electrolytic copper-Zinc alloys-Light alloys with thin broken swarf (alloys of silicon).

D	L	l	Code	Price
mm.	mm.	mm.		€
1	26	6	A100300100000	1,89
1,5	32	9	A100300150000	1,69
2	38	12	A100300200000	1,66
2,1	38	12	A100300210000	1,94
2,2	40	13	A100300220000	1,94
2,25	40	13	A100300225000	1,66
2,3	40	13	A100300230000	1,94
2,4	43	14	A100300240000	1,94
2,5	43	14	A100300250000	1,48
2,6	43	14	A100300260000	1,79
2,7	46	16	A100300270000	1,79
2,75	46	16	A100300275000	1,56
2,8	46	16	A100300280000	1,81
2,9	46	16	A100300290000	1,82
3	46	16	A100300300000	1,56
3,1	49	18	A100300310000	1,78
3,2	49	18	A100300320000	1,78
3,25	49	18	A100300325000	1,69
3,3	49	18	A100300330000	1,78
3,4	52	20	A100300340000	1,94
3,5	52	20	A100300350000	1,69
3,6	52	20	A100300360000	2,13
3,7	52	20	A100300370000	2,13
3,75	52	20	A100300375000	1,85
3,8	55	22	A100300380000	2,13
3,9	55	22	A100300390000	2,13
4	55	22	A100300400000	1,85
4,1	55	22	A100300410000	2,32
4,2	55	22	A100300420000	2,32
4,25	55	22	A100300425000	2,21
4,3	58	24	A100300430000	2,54
4,4	58	24	A100300440000	2,55
4,5	58	24	A100300450000	2,21
4,6	58	24	A100300460000	2,89
4,7	58	24	A100300470000	2,87
4,75	58	24	A100300475000	2,46
4,8	62	26	A100300480000	2,87
4,9	62	26	A100300490000	2,87
5	62	26	A100300500000	2,46
5,1	62	26	A100300510000	3,16

D	L	l	Code	Price
mm.	mm.	mm.		€
5,2	62	26	A100300520000	3,14
5,25	62	26	A100300525000	2,71
5,3	62	26	A100300530000	3,19
5,4	66	28	A100300540000	3,19
5,5	66	28	A100300550000	2,71
5,6	66	28	A100300560000	3,61
5,7	66	28	A100300570000	3,63
5,75	66	28	A100300575000	3,10
5,8	66	28	A100300580000	3,61
5,9	66	28	A100300590000	3,63
6	66	28	A100300600000	3,10
6,25	70	31	A100300625000	3,71
6,5	70	31	A100300650000	3,71
6,75	74	34	A100300675000	4,30
7	74	34	A100300700000	4,30
7,25	74	34	A100300725000	4,86
7,5	74	34	A100300750000	4,86
7,75	79	37	A100300775000	5,34
8	79	37	A100300800000	5,34
8,25	79	37	A100300825000	6,36
8,5	79	37	A100300850000	6,36
8,75	84	40	A100300875000	6,93
9	84	40	A100300900000	6,93
9,25	84	40	A100300925000	7,77
9,5	84	40	A100300950000	7,77
9,75	89	43	A100300975000	8,69
10	89	43	A100301000000	8,69
10,5	89	43	A100301050000	9,79
11	95	47	A100301100000	10,93
11,5	95	47	A100301150000	12,13
12	102	51	A100301200000	12,78
12,5	102	51	A100301250000	14,39
13	102	51	A100301300000	15,74
13,5	107	54	A100301350000	19,97
14	107	54	A100301400000	21,63
14,5	111	56	A100301450000	24,67
15	111	56	A100301500000	27,78
15,5	115	58	A100301550000	33,47
16	115	58	A100301600000	33,47

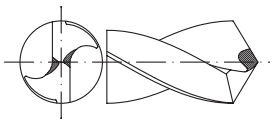
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	28	45	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
2	22,5	35	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
3	18	28	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
4	14	22,5	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
13.1	28	40	(A) (B)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
13.2	22,5	28	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
26	18	28	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

100.40
DIN 1897

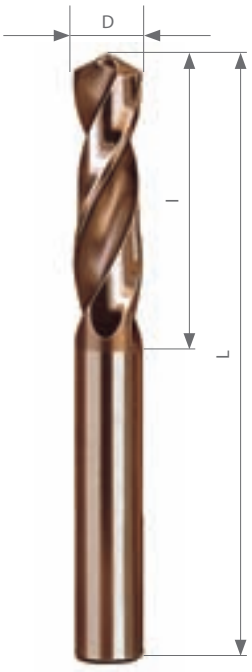


Classic series HSSCo 5 % | Type NF 3 x D

Standard stub drills
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	135°
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated, golden-brown



Details and applications

Made of HSSCo, this drill increases the resistance of our family 100.30 to high temperatures. Its design, with reinforced web along all its length enables this drill to be used in working hard, difficult and resistant materials. For higher performance we suggest our Optimus families 185.43 and 185.44. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
1	26	6	A100400100000	3,71
1,5	32	9	A100400150000	3,71
2	38	12	A100400200000	3,03
2,1	38	12	A100400210000	4,04
2,2	40	13	A100400220000	4,02
2,25	40	13	A100400225000	4,16
2,3	40	13	A100400230000	4,04
2,4	43	14	A100400240000	4,04
2,5	43	14	A100400250000	2,73
2,6	43	14	A100400260000	3,24
2,7	46	16	A100400270000	3,22
2,75	46	16	A100400275000	3,30
2,8	46	16	A100400280000	3,24
2,9	46	16	A100400290000	3,24
3	46	16	A100400300000	2,71
3,1	49	18	A100400310000	2,93
3,2	49	18	A100400320000	2,94
3,25	49	18	A100400325000	2,92
3,3	49	18	A100400330000	2,93
3,4	52	20	A100400340000	3,60
3,5	52	20	A100400350000	2,92
3,6	52	20	A100400360000	3,60
3,7	52	20	A100400370000	3,60
3,75	52	20	A100400375000	3,73
3,8	55	22	A100400380000	3,60
3,9	55	22	A100400390000	3,60
4	55	22	A100400400000	3,23
4,1	55	22	A100400410000	3,81
4,2	55	22	A100400420000	3,87
4,25	55	22	A100400425000	3,81
4,3	58	24	A100400430000	4,50
4,4	58	24	A100400440000	4,50
4,5	58	24	A100400450000	3,81
4,6	58	24	A100400460000	4,69
4,7	58	24	A100400470000	4,69
4,75	58	24	A100400475000	4,29
4,8	62	26	A100400480000	4,69
4,9	62	26	A100400490000	4,69
5	62	26	A100400500000	4,30
5,1	62	26	A100400510000	5,29

D	L	l	Code	Price
mm.	mm.	mm.		€
5,2	62	26	A100400520000	5,29
5,25	62	26	A100400525000	4,78
5,3	62	26	A100400530000	5,27
5,4	66	28	A100400540000	5,27
5,5	66	28	A100400550000	4,78
5,6	66	28	A100400560000	5,60
5,7	66	28	A100400570000	5,60
5,75	66	28	A100400575000	5,80
5,8	66	28	A100400580000	5,60
5,9	66	28	A100400590000	5,60
6	66	28	A100400600000	5,44
6,25	70	31	A100400625000	7,17
6,5	70	31	A100400650000	6,49
6,75	74	34	A100400675000	9,08
7	74	34	A100400700000	7,46
7,25	74	34	A100400725000	9,51
7,5	74	34	A100400750000	9,62
7,75	79	37	A100400775000	9,60
8	79	37	A100400800000	9,36
8,25	79	37	A100400825000	12,31
8,5	79	37	A100400850000	11,09
8,75	84	40	A100400875000	13,29
9	84	40	A100400900000	12,10
9,25	84	40	A100400925000	15,07
9,5	84	40	A100400950000	13,61
9,75	89	43	A100400975000	16,96
10	89	43	A100401000000	15,18
10,5	89	43	A100401050000	16,73
11	95	47	A100401100000	18,93
11,5	95	47	A100401150000	21,00
12	102	51	A100401200000	22,16
12,5	102	51	A100401250000	25,16
13	102	51	A100401300000	27,52
13,5	107	54	A100401350000	34,83
14	107	54	A100401400000	37,49
14,5	111	56	A100401450000	52,02
15	111	56	A100401500000	52,79
15,5	115	58	A100401550000	61,07
16	115	58	A100401600000	63,34

Cutting conditions and recommended material

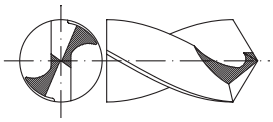
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
3	28	33,75	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
4	16,5	22,5	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	11,25	18	(A)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
6	15,75	15,75	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
7	9	14	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
8	7	11,25	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
10	4,5	6,75	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
13.1	33	39	(B) (A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
13.2	25	36	(B) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

102.30
DIN 1897

Classic series HSS | Type N



Double ended. Body drills
Straight shank drills

Design and technical specifications

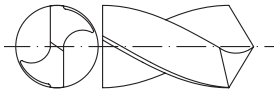
Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Normal, uncleared flutes
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)

Details and applications

A rigid drill, pointed at both ends (better performance and more use). Its use is specially recommended in hand drilling machines for drilling sheet metal (car bodies, etc.), and making the holes for rivets in thin sections. It is possible to drill in polished and inclined surfaces without sliding thanks to its better stability and the self centring capacity (thanks to the split point). Generally used in sheet metal works. Use to drill: Thin metals (sheets) with tensile strength not higher than 900 N/mm^2.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	38	8	**A102300200000**	**3,34**
2,5	43	10	**A102300250000**	**3,31**
3	46	10	**A102300300000**	**2,89**
3,1	49	11	**A102300310000**	**2,90**
3,25	49	11	**A102300325000**	**2,88**
3,3	49	11	**A102300330000**	**2,96**
3,5	52	12	**A102300350000**	**3,19**
4	55	14	**A102300400000**	**3,29**
4,1	55	14	**A102300410000**	**3,49**
4,2	55	14	**A102300420000**	**3,49**
4,25	55	14	**A102300425000**	**3,58**
4,5	58	15	**A102300450000**	**3,64**
4,75	58	15	**A102300475000**	**5,93**
5	62	17	**A102300500000**	**4,18**
5,1	62	17	**A102300510000**	**5,78**
5,5	66	19	**A102300550000**	**5,06**
6	66	19	**A102300600000**	**5,64**
6,5	70	21	**A102300650000**	**6,56**
7	74	24	**A102300700000**	**7,10**
7,5	74	24	**A102300750000**	**8,00**
8	79	25	**A102300800000**	**9,10**
8,5	79	25	**A102300850000**	**9,62**
9	84	25	**A102300900000**	**12,79**
9,5	84	25	**A102300950000**	**14,49**
9,75	89	25	**A102300975000**	**16,09**
10	89	25	**A102301000000**	**10,96**

105.30
DIN 338



Classic series HSS | Type N 5 x D

Jobber drills
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)

Details and applications

The slender geometry and the strength of this tool, the surface treatment and its dimensional characteristics make this drill "the standard straight shank drill". It can be used in a wide range of applications. In this range of sizes it is our most economic family. For higher performance we suggest our Optimus families 183.43 and 183.44. Use to drill: Steel and cast steel, alloyed and non-alloyed, up to 900 N/mm^2- Grey cast iron-Malleable cast iron-Spheroidal cast iron-Pressure casting-Sintered iron-German silver-Graphite or carbon-Phosphor bronze for bearings-Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu), continuous swarf-Electrolytic copper-Zinc alloys-Light metal with thin, broken swarf (alloys of silicon)

D	L	l	Code	Price
mm.	mm.	mm.		€
0,2	19	2,5	A105300020000	5,82
0,21	19	2,5	A105300021000	5,82
0,22	19	2,5	A105300022000	5,82
0,23	19	2,5	A105300023000	5,82
0,24	19	2,5	A105300024000	5,82
0,25	19	3	A105300025000	4,23
0,26	19	3	A105300026000	5,29
0,27	19	3	A105300027000	5,29
0,28	19	3	A105300028000	5,29
0,29	19	3	A105300029000	5,29
0,3	19	3	A105300030000	3,70
0,31	19	4	A105300031000	4,29
0,32	19	4	A105300032000	4,29
0,33	19	4	A105300033000	4,29
0,34	19	4	A105300034000	4,29
0,35	19	4	A105300035000	3,09
0,36	19	4	A105300036000	4,29
0,37	19	4	A105300037000	4,29
0,38	19	4	A105300038000	4,29
0,39	20	5	A105300039000	4,29
0,4	20	5	A105300040000	3,23
0,41	20	5	A105300041000	4,03
0,42	20	5	A105300042000	4,03
0,43	20	5	A105300043000	4,03
0,44	20	5	A105300044000	4,03
0,45	20	5	A105300045000	2,57
0,46	20	5	A105300046000	4,03
0,47	20	5	A105300047000	4,03
0,48	20	5	A105300048000	4,03
0,49	22	6	A105300049000	4,03
0,5	22	6	A105300050000	2,44
0,51	22	6	A105300051000	3,31
0,52	22	6	A105300052000	3,31
0,53	22	6	A105300053000	3,31
0,54	24	7	A105300054000	3,31
0,55	24	7	A105300055000	2,97
0,56	24	7	A105300056000	3,31
0,57	24	7	A105300057000	3,31
0,58	24	7	A105300058000	3,31
0,59	24	7	A105300059000	3,31
0,6	24	7	A105300060000	2,44
0,61	26	8	A105300061000	3,31
0,62	26	8	A105300062000	3,31
0,63	26	8	A105300063000	3,31
0,64	26	8	A105300064000	3,31
0,65	26	8	A105300065000	2,97
0,66	26	8	A105300066000	3,43
0,67	26	8	A105300067000	3,43
0,68	28	9	A105300068000	3,23
0,69	28	9	A105300069000	3,23
0,7	28	9	A105300070000	2,25
0,71	28	9	A105300071000	2,57
0,72	28	9	A105300072000	2,57
0,73	28	9	A105300073000	2,57
0,74	28	9	A105300074000	2,57
0,75	28	9	A105300075000	1,98
0,76	30	10	A105300076000	2,51
0,77	30	10	A105300077000	2,51
0,78	30	10	A105300078000	2,51
0,79	30	10	A105300079000	2,51
0,8	30	10	A105300080000	2,05

D	L	l	Code	Price
mm.	mm.	mm.		€
0,81	30	10	A105300081000	2,64
0,82	30	10	A105300082000	2,64
0,83	30	10	A105300083000	2,64
0,84	30	10	A105300084000	2,64
0,85	30	10	A105300085000	2,31
0,86	32	11	A105300086000	2,64
0,87	32	11	A105300087000	2,64
0,88	32	11	A105300088000	2,64
0,89	32	11	A105300089000	2,64
0,9	32	11	A105300090000	1,98
0,91	32	11	A105300091000	2,44
0,92	32	11	A105300092000	2,44
0,93	32	11	A105300093000	2,44
0,94	32	11	A105300094000	2,44
0,95	32	11	A105300095000	2,17
0,96	34	12	A105300096000	2,37
0,97	34	12	A105300097000	2,37
0,98	34	12	A105300098000	2,37
0,99	34	12	A105300099000	2,37
1	34	12	A105300100000	1,45
1,05	34	12	A105300105000	1,78
1,1	36	14	A105300110000	1,45
1,15	36	14	A105300115000	1,91
1,2	38	16	A105300120000	1,45
1,25	38	16	A105300125000	1,52
1,3	38	16	A105300130000	1,45
1,35	40	18	A105300135000	1,78
1,4	40	18	A105300140000	1,45
1,45	40	18	A105300145000	1,78
1,5	40	18	A105300150000	1,24
1,55	43	20	A105300155000	1,57
1,6	43	20	A105300160000	1,56
1,65	43	20	A105300165000	1,57
1,7	43	20	A105300170000	1,56
1,75	46	22	A105300175000	1,38
1,8	46	22	A105300180000	1,38
1,85	46	22	A105300185000	1,38
1,9	46	22	A105300190000	1,39
1,95	49	24	A105300195000	1,39
2	49	24	A105300200000	1,18
2,05	49	24	A105300205000	1,36
2,1	49	24	A105300210000	1,38
2,15	49	24	A105300215000	1,36
2,2	53	27	A105300220000	1,36
2,25	53	27	A105300225000	1,24
2,3	53	27	A105300230000	1,58
2,35	53	27	A105300235000	1,60
2,4	57	30	A105300240000	1,59
2,45	57	30	A105300245000	1,60
2,5	57	30	A105300250000	1,31
2,55	57	30	A105300255000	1,64
2,6	57	30	A105300260000	1,63
2,65	57	30	A105300265000	1,63
2,7	61	33	A105300270000	1,63
2,75	61	33	A105300275000	1,40
2,8	61	33	A105300280000	1,63
2,85	61	33	A105300285000	1,62
2,9	61	33	A105300290000	1,61
2,95	61	33	A105300295000	1,61
3	61	33	A105300300000	1,18
3,1	65	36	A105300310000	1,39

105.30
DIN 338

Classic series
HSS

Type N
5 x D

Jobber drills
Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
3,2	65	36	A105300320000	1,39
3,25	65	36	A105300325000	1,38
3,3	65	36	A105300330000	1,39
3,4	70	39	A105300340000	1,77
3,5	70	39	A105300350000	1,36
3,6	70	39	A105300360000	1,83
3,7	70	39	A105300370000	1,85
3,75	70	39	A105300375000	1,58
3,8	75	43	A105300380000	1,91
3,9	75	43	A105300390000	1,91
4	75	43	A105300400000	1,54
4,1	75	43	A105300410000	1,71
4,2	75	43	A105300420000	1,73
4,25	75	43	A105300425000	1,71
4,3	80	47	A105300430000	2,27
4,4	80	47	A105300440000	2,28
4,5	80	47	A105300450000	1,75
4,6	80	47	A105300460000	2,30
4,7	80	47	A105300470000	2,29
4,75	80	47	A105300475000	2,03
4,8	86	52	A105300480000	2,52
4,9	86	52	A105300490000	2,48
5	86	52	A105300500000	1,87
5,1	86	52	A105300510000	2,55
5,2	86	52	A105300520000	2,56
5,25	86	52	A105300525000	2,40
5,3	86	52	A105300530000	3,18
5,4	93	57	A105300540000	3,18
5,5	93	57	A105300550000	2,49
5,6	93	57	A105300560000	3,39
5,7	93	57	A105300570000	3,39
5,75	93	57	A105300575000	3,26
5,8	93	57	A105300580000	3,17
5,9	93	57	A105300590000	3,17
6	93	57	A105300600000	2,58
6,1	101	63	A105300610000	3,69
6,2	101	63	A105300620000	3,69
6,25	101	63	A105300625000	3,46
6,3	101	63	A105300630000	3,86
6,4	101	63	A105300640000	3,97
6,5	101	63	A105300650000	3,02
6,6	101	63	A105300660000	4,81
6,7	101	63	A105300670000	4,86
6,75	109	69	A105300675000	3,64
6,8	109	69	A105300680000	3,77
6,9	109	69	A105300690000	5,31
7	109	69	A105300700000	3,64
7,1	109	69	A105300710000	5,67
7,2	109	69	A105300720000	5,67

D	L	l	Code	Price
mm.	mm.	mm.		€
7,25	109	69	A105300725000	4,61
7,3	109	69	A105300730000	5,66
7,4	109	69	A105300740000	5,66
7,5	109	69	A105300750000	3,84
7,6	117	75	A105300760000	6,65
7,7	117	75	A105300770000	6,65
7,75	117	75	A105300775000	5,18
7,8	117	75	A105300780000	6,73
7,9	117	75	A105300790000	6,73
8	117	75	A105300800000	4,40
8,1	117	75	A105300810000	6,88
8,2	117	75	A105300820000	6,86
8,25	117	75	A105300825000	5,19
8,3	117	75	A105300830000	7,18
8,4	117	75	A105300840000	7,15
8,5	117	75	A105300850000	4,79
8,6	125	81	A105300860000	8,95
8,7	125	81	A105300870000	8,99
8,75	125	81	A105300875000	6,85
8,8	125	81	A105300880000	9,02
8,9	125	81	A105300890000	8,98
9	125	81	A105300900000	5,78
9,1	125	81	A105300910000	9,03
9,2	125	81	A105300920000	9,07
9,25	125	81	A105300925000	7,04
9,3	125	81	A105300930000	8,59
9,4	125	81	A105300940000	8,59
9,5	125	81	A105300950000	6,30
9,6	133	87	A105300960000	10,82
9,7	133	87	A105300970000	10,82
9,75	133	87	A105300975000	7,83
9,8	133	87	A105300980000	10,66
9,9	133	87	A105300990000	10,70
10	133	87	A105301000000	6,76
10,1	133	87	A105301010000	9,24
10,2	133	87	A105301020000	8,62
10,25	133	87	A105301025000	9,44
10,3	133	87	A105301030000	10,68
10,4	133	87	A105301040000	10,68
10,5	133	87	A105301050000	8,51
10,6	133	87	A105301060000	11,83
10,7	142	94	A105301070000	11,83
10,75	142	94	A105301075000	11,07
10,8	142	94	A105301080000	13,09
10,9	142	94	A105301090000	13,09
11	142	94	A105301100000	9,95
11,1	142	94	A105301110000	13,34
11,2	142	94	A105301120000	13,34
11,25	142	94	A105301125000	11,25

D	L	l	Code	Price
mm.	mm.	mm.		€
11,3	142	94	A105301130000	13,15
11,4	142	94	A105301140000	13,09
11,5	142	94	A105301150000	10,59
11,6	142	94	A105301160000	13,09
11,7	142	94	A105301170000	13,09
11,75	142	94	A105301175000	11,25
11,8	142	94	A105301180000	14,28
11,9	151	101	A105301190000	14,35
12	151	101	A105301200000	11,83
12,1	151	101	A105301210000	16,73
12,2	151	101	A105301220000	16,73
12,25	151	101	A105301225000	14,68
12,3	151	101	A105301230000	15,84
12,4	151	101	A105301240000	15,84
12,5	151	101	A105301250000	12,92
12,6	151	101	A105301260000	16,28
12,7	151	101	A105301270000	16,43
12,75	151	101	A105301275000	14,39
12,8	151	101	A105301280000	18,15
12,9	151	101	A105301290000	18,15
13	151	101	A105301300000	13,46
13,1	151	101	A105301310000	18,51
13,2	151	101	A105301320000	18,51
13,25	160	108	A105301325000	20,94
13,3	160	108	A105301330000	28,67
13,4	160	108	A105301340000	28,67
13,5	160	108	A105301350000	18,87
13,6	160	108	A105301360000	28,67
13,7	160	108	A105301370000	28,67
13,75	160	108	A105301375000	21,18
13,8	160	108	A105301380000	27,44
13,9	160	108	A105301390000	27,20
14	160	108	A105301400000	20,05
14,25	169	114	A105301425000	23,72
14,5	169	114	A105301450000	21,58
14,75	169	114	A105301475000	23,72
15	169	114	A105301500000	22,03
15,25	178	120	A105301525000	32,17
15,5	178	120	A105301550000	25,79
15,75	178	120	A105301575000	32,78
16	178	120	A105301600000	26,83
16,5	184	125	A105301650000	30,82
17	184	125	A105301700000	30,90
17,5	191	130	A105301750000	35,42
18	191	130	A105301800000	37,47
18,5	198	135	A105301850000	41,58
19	198	135	A105301900000	41,58
19,5	205	140	A105301950000	44,66
20	205	140	A105302000000	51,34

Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	25	40	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
2	20	31,5	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
3	16	25	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
4	12,5	20	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
13.1	25	35	(A) (B)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
13.2	20	25	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
26	16	25	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

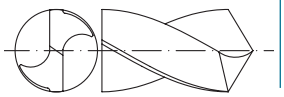
r.p.m. = Vc x 1000/ (π x D)

105.34
DIN 338

Classic series
HSS

Type N
5 x D

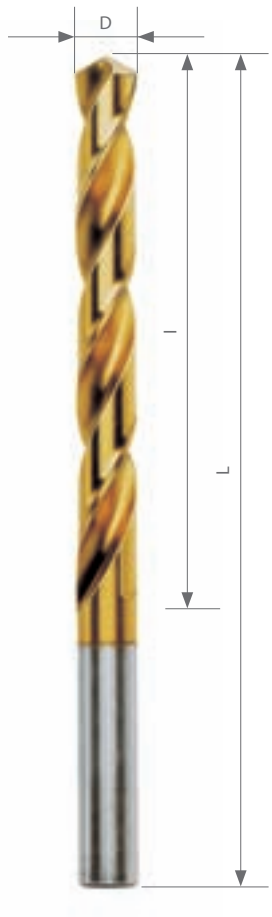
TiN



Jobber drills
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

Thanks to its Titanium coating, this drill offers a higher performance than our family 105.30 and it also allows an increase of the cutting conditions. This is our most economic version among our coated drills. For higher performance we suggest our Optimus families 183.43 and 183.44. Use to drill: Steel and cast steel, alloyed and non-alloyed, up to 900 N/mm^2- Grey cast iron-Malleable cast iron-Pressure casting-German silver-Graphite-phosphor bronze for bearings-Bronze alloys of aluminium, lead, magnesium or silicon-Soft brass (≥60% Cu) continuous swarf-Electrolytic copper-Zinc alloys with thin broken swarf (alloys of silicon).

D	L	l	Code	Price
mm.	mm.	mm.		€
0,2	19	2,5	A105340020000	13,96
0,21	19	2,5	A105340021000	13,96
0,22	19	2,5	A105340022000	13,96
0,23	19	2,5	A105340023000	13,96
0,24	19	2,5	A105340024000	13,96
0,25	19	3	A105340025000	10,15
0,26	19	3	A105340026000	12,69
0,27	19	3	A105340027000	12,69
0,28	19	3	A105340028000	12,69
0,29	19	3	A105340029000	12,69
0,3	19	3	A105340030000	8,88
0,31	19	4	A105340031000	10,30
0,32	19	4	A105340032000	10,30
0,33	19	4	A105340033000	10,30
0,34	19	4	A105340034000	10,30
0,35	19	4	A105340035000	7,42
0,36	19	4	A105340036000	10,30
0,37	19	4	A105340037000	10,30
0,38	19	4	A105340038000	10,30
0,39	20	5	A105340039000	10,30
0,4	20	5	A105340040000	7,76
0,41	20	5	A105340041000	9,68
0,42	20	5	A105340042000	9,68
0,43	20	5	A105340043000	9,68
0,44	20	5	A105340044000	9,68
0,45	20	5	A105340045000	6,18
0,46	20	5	A105340046000	9,68
0,47	20	5	A105340047000	9,68
0,48	20	5	A105340048000	9,68
0,49	22	6	A105340049000	9,68
0,5	22	6	A105340050000	5,87
0,51	22	6	A105340051000	7,94
0,52	22	6	A105340052000	7,94
0,53	22	6	A105340053000	7,94
0,54	24	7	A105340054000	7,94
0,55	24	7	A105340055000	7,14
0,56	24	7	A105340056000	7,94
0,57	24	7	A105340057000	7,94
0,58	24	7	A105340058000	7,94
0,59	24	7	A105340059000	7,94
0,6	24	7	A105340060000	5,87
0,61	26	8	A105340061000	7,94
0,62	26	8	A105340062000	7,94
0,63	26	8	A105340063000	7,94
0,64	26	8	A105340064000	7,94
0,65	26	8	A105340065000	7,14
0,66	26	8	A105340066000	8,23
0,67	26	8	A105340067000	8,23
0,68	28	9	A105340068000	7,76
0,69	28	9	A105340069000	7,76
0,7	28	9	A105340070000	5,40
0,71	28	9	A105340071000	6,18
0,72	28	9	A105340072000	6,18
0,73	28	9	A105340073000	6,18
0,74	28	9	A105340074000	6,18
0,75	28	9	A105340075000	4,75
0,76	30	10	A105340076000	6,02
0,77	30	10	A105340077000	6,02
0,78	30	10	A105340078000	6,02
0,79	30	10	A105340079000	6,02
0,8	30	10	A105340080000	4,93
0,81	30	10	A105340081000	6,33

D	L	l	Code	Price
mm.	mm.	mm.		€
0,82	30	10	A105340082000	6,33
0,83	30	10	A105340083000	6,33
0,84	30	10	A105340084000	6,33
0,85	30	10	A105340085000	5,55
0,86	32	11	A105340086000	6,33
0,87	32	11	A105340087000	6,33
0,88	32	11	A105340088000	6,33
0,89	32	11	A105340089000	6,33
0,9	32	11	A105340090000	4,75
0,91	32	11	A105340091000	5,87
0,92	32	11	A105340092000	5,87
0,93	32	11	A105340093000	5,87
0,94	32	11	A105340094000	5,87
0,95	32	11	A105340095000	5,22
0,96	34	12	A105340096000	5,68
0,97	34	12	A105340097000	5,68
0,98	34	12	A105340098000	5,68
0,99	34	12	A105340099000	5,68
1	34	12	A105340100000	3,48
1,05	34	12	A105340105000	4,28
1,1	36	14	A105340110000	3,48
1,15	36	14	A105340115000	4,59
1,2	38	16	A105340120000	3,48
1,25	38	16	A105340125000	3,66
1,3	38	16	A105340130000	3,48
1,35	40	18	A105340135000	4,28
1,4	40	18	A105340140000	3,48
1,45	40	18	A105340145000	4,28
1,5	40	18	A105340150000	2,98
1,55	43	20	A105340155000	3,77
1,6	43	20	A105340160000	3,74
1,65	43	20	A105340165000	3,77
1,7	43	20	A105340170000	3,74
1,75	46	22	A105340175000	3,31
1,8	46	22	A105340180000	3,31
1,85	46	22	A105340185000	3,31
1,9	46	22	A105340190000	3,34
1,95	49	24	A105340195000	3,34
2	49	24	A105340200000	2,83
2,05	49	24	A105340205000	3,26
2,1	49	24	A105340210000	3,31
2,15	49	24	A105340215000	3,26
2,2	53	27	A105340220000	3,26
2,25	53	27	A105340225000	2,98
2,3	53	27	A105340230000	3,79
2,35	53	27	A105340235000	3,84
2,4	57	30	A105340240000	3,82
2,45	57	30	A105340245000	3,84
2,5	57	30	A105340250000	3,14
2,55	57	30	A105340255000	3,94
2,6	57	30	A105340260000	3,91
2,65	57	30	A105340265000	3,91
2,7	61	33	A105340270000	3,91
2,75	61	33	A105340275000	3,36
2,8	61	33	A105340280000	3,91
2,85	61	33	A105340285000	3,89
2,9	61	33	A105340290000	3,86
2,95	61	33	A105340295000	3,86
3	61	33	A105340300000	2,83
3,1	65	36	A105340310000	3,34
3,2	65	36	A105340320000	3,34
3,25	65	36	A105340325000	3,31

105.34 DIN 338	Classic series HSS	Type N 5 x D	TiN	Jobber drills Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
3,3	65	36	A105340330000	3,34
3,4	70	39	A105340340000	4,25
3,5	70	39	A105340350000	3,26
3,6	70	39	A105340360000	4,39
3,7	70	39	A105340370000	4,44
3,75	70	39	A105340375000	3,79
3,8	75	43	A105340380000	4,58
3,9	75	43	A105340390000	4,58
4	75	43	A105340400000	3,70
4,1	75	43	A105340410000	4,10
4,2	75	43	A105340420000	4,15
4,25	75	43	A105340425000	4,10
4,3	80	47	A105340430000	5,45
4,4	80	47	A105340440000	5,47
4,5	80	47	A105340450000	4,20
4,6	80	47	A105340460000	5,52
4,7	80	47	A105340470000	5,50
4,75	80	47	A105340475000	4,87
4,8	86	52	A105340480000	6,05
4,9	86	52	A105340490000	5,95
5	86	52	A105340500000	4,49
5,1	86	52	A105340510000	6,12
5,2	86	52	A105340520000	6,14
5,25	86	52	A105340525000	5,76
5,3	86	52	A105340530000	7,63
5,4	93	57	A105340540000	7,63
5,5	93	57	A105340550000	5,98
5,6	93	57	A105340560000	8,14
5,7	93	57	A105340570000	8,14
5,75	93	57	A105340575000	7,82
5,8	93	57	A105340580000	7,61
5,9	93	57	A105340590000	7,61
6	93	57	A105340600000	6,19
6,1	101	63	A105340610000	8,86
6,2	101	63	A105340620000	8,86
6,25	101	63	A105340625000	8,30
6,3	101	63	A105340630000	9,26
6,4	101	63	A105340640000	9,53
6,5	101	63	A105340650000	7,25
6,6	101	63	A105340660000	11,54
6,7	101	63	A105340670000	11,66
6,75	109	69	A105340675000	8,74
6,8	109	69	A105340680000	9,05
6,9	109	69	A105340690000	12,74
7	109	69	A105340700000	8,74
7,1	109	69	A105340710000	13,61
7,2	109	69	A105340720000	13,61
7,25	109	69	A105340725000	11,06
7,3	109	69	A105340730000	13,58

D	L	l	Code	Price
mm.	mm.	mm.		€
7,4	109	69	A105340740000	13,58
7,5	109	69	A105340750000	9,22
7,6	117	75	A105340760000	15,96
7,7	117	75	A105340770000	15,96
7,75	117	75	A105340775000	12,43
7,8	117	75	A105340780000	16,15
7,9	117	75	A105340790000	16,15
8	117	75	A105340800000	10,56
8,1	117	75	A105340810000	16,51
8,2	117	75	A105340820000	16,46
8,25	117	75	A105340825000	12,46
8,3	117	75	A105340830000	17,23
8,4	117	75	A105340840000	17,16
8,5	117	75	A105340850000	11,50
8,6	125	81	A105340860000	21,48
8,7	125	81	A105340870000	21,58
8,75	125	81	A105340875000	16,44
8,8	125	81	A105340880000	21,65
8,9	125	81	A105340890000	21,55
9	125	81	A105340900000	13,87
9,1	125	81	A105340910000	21,67
9,2	125	81	A105340920000	21,77
9,25	125	81	A105340925000	16,90
9,3	125	81	A105340930000	20,62
9,4	125	81	A105340940000	20,62
9,5	125	81	A105340950000	15,12
9,6	133	87	A105340960000	25,97
9,7	133	87	A105340970000	25,97
9,75	133	87	A105340975000	18,79
9,8	133	87	A105340980000	25,58
9,9	133	87	A105340990000	25,68
10	133	87	A105341000000	16,22
10,1	133	87	A105341010000	22,18
10,2	133	87	A105341020000	20,69
10,25	133	87	A105341025000	22,66
10,3	133	87	A105341030000	25,63
10,4	133	87	A105341040000	25,63
10,5	133	87	A105341050000	20,42
10,6	133	87	A105341060000	28,39
10,7	142	94	A105341070000	28,39
10,75	142	94	A105341075000	26,57
10,8	142	94	A105341080000	31,42
10,9	142	94	A105341090000	31,42
11	142	94	A105341100000	23,88
11,1	142	94	A105341110000	32,02
11,2	142	94	A105341120000	32,02
11,25	142	94	A105341125000	27,00
11,3	142	94	A105341130000	31,56
11,4	142	94	A105341140000	31,42

D	L	l	Code	Price
mm.	mm.	mm.		€
11,5	142	94	A105341150000	25,42
11,6	142	94	A105341160000	31,42
11,7	142	94	A105341170000	31,42
11,75	142	94	A105341175000	27,00
11,8	142	94	A105341180000	34,27
11,9	151	101	A105341190000	34,44
12	151	101	A105341200000	28,39
12,1	151	101	A105341210000	40,15
12,2	151	101	A105341220000	40,15
12,25	151	101	A105341225000	35,23
12,3	151	101	A105341230000	38,02
12,4	151	101	A105341240000	38,02
12,5	151	101	A105341250000	31,01
12,6	151	101	A105341260000	39,07
12,7	151	101	A105341270000	39,43
12,75	151	101	A105341275000	34,54
12,8	151	101	A105341280000	43,56
12,9	151	101	A105341290000	43,56
13	151	101	A105341300000	32,30
13,1	151	101	A105341310000	44,42
13,2	151	101	A105341320000	44,42
13,25	160	108	A105341325000	50,26
13,3	160	108	A105341330000	68,81
13,4	160	108	A105341340000	68,81
13,5	160	108	A105341350000	45,29
13,6	160	108	A105341360000	68,81
13,7	160	108	A105341370000	68,81
13,75	160	108	A105341375000	50,83
13,8	160	108	A105341380000	65,86
13,9	160	108	A105341390000	65,28
14	160	108	A105341400000	48,12
14,25	169	114	A105341425000	56,93
14,5	169	114	A105341450000	51,79
14,75	169	114	A105341475000	56,93
15	169	114	A105341500000	52,87
15,25	178	120	A105341525000	77,21
15,5	178	120	A105341550000	61,90
15,75	178	120	A105341575000	78,67
16	178	120	A105341600000	64,39
16,5	184	125	A105341650000	73,97
17	184	125	A105341700000	74,16
17,5	191	130	A105341750000	85,01
18	191	130	A105341800000	89,93
18,5	198	135	A105341850000	99,79
19	198	135	A105341900000	99,79
19,5	205	140	A105341950000	107,18
20	205	140	A105342000000	123,22

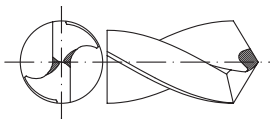
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	32	45	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
2	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
3	20	31,5	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
4	16	25	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	10	14	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
13.1	31,5	40	(C)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
13.2	25	31,5	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
16	40	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
17	32	50	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
19	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
20	16	30	(B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
26	20	31,5	(D)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
30	3	6,25	(D)	MANUAL											

r.p.m. = Vc x 1000/ (π x D)

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

180.40
DIN 338



Classic series HSSCo 5 %

Type NF 5 x D

Jobber drills

Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	135°
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated, golden-brown

Details and applications

The high strength at elevated temperatures of the cobalt high speed steel HSSCo and the design of the reinforced web in the whole length of the drill are characteristics which give to this drill its capacity for use in working with materials which are hard, strong and difficult to machine. It is our standard economic straight shank made of HSSCo 5%. For high performance we suggest our Optimus families 183.43 and 183.44. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 to 1200 N/mm^2.- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron, spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
1	34	12	A180400100000	2,28
1,1	36	14	A180400110000	2,79
1,2	38	16	A180400120000	2,78
1,25	38	16	A180400125000	2,66
1,3	38	16	A180400130000	2,78
1,4	40	18	A180400140000	2,77
1,5	40	18	A180400150000	2,15
1,6	43	20	A180400160000	2,77
1,7	43	20	A180400170000	2,77
1,75	46	22	A180400175000	2,66
1,8	46	22	A180400180000	2,77
1,9	46	22	A180400190000	2,77
2	49	24	A180400200000	2,23
2,1	49	24	A180400210000	2,87
2,2	53	27	A180400220000	2,87
2,25	53	27	A180400225000	2,76
2,3	53	27	A180400230000	2,87
2,4	57	30	A180400240000	2,87
2,5	57	30	A180400250000	2,24
2,6	57	30	A180400260000	2,81
2,7	61	33	A180400270000	2,81
2,75	61	33	A180400275000	2,75
2,8	61	33	A180400280000	2,84
2,9	61	33	A180400290000	2,81
3	61	33	A180400300000	2,20
3,1	65	36	A180400310000	2,66
3,2	65	36	A180400320000	2,67
3,25	65	36	A180400325000	2,66
3,3	65	36	A180400330000	2,67
3,4	70	39	A180400340000	2,80
3,5	70	39	A180400350000	2,62
3,6	70	39	A180400360000	3,35
3,7	70	39	A180400370000	3,35
3,75	70	39	A180400375000	3,13
3,8	75	43	A180400380000	3,35
3,9	75	43	A180400390000	3,35
4	75	43	A180400400000	2,84
4,1	75	43	A180400410000	3,16
4,2	75	43	A180400420000	3,16
4,25	75	43	A180400425000	3,13
4,3	80	47	A180400430000	3,38
4,4	80	47	A180400440000	3,38
4,5	80	47	A180400450000	3,23
4,6	80	47	A180400460000	3,75
4,7	80	47	A180400470000	3,75
4,75	80	47	A180400475000	3,52
4,8	86	52	A180400480000	3,77
4,9	86	52	A180400490000	3,79
5	86	52	A180400500000	3,40
5,1	86	52	A180400510000	4,07
5,2	86	52	A180400520000	4,08
5,25	86	52	A180400525000	3,97

D	L	l	Code	Price
mm.	mm.	mm.		€
5,3	86	52	A180400530000	4,04
5,4	93	57	A180400540000	4,06
5,5	93	57	A180400550000	4,32
5,6	93	57	A180400560000	5,14
5,7	93	57	A180400570000	5,14
5,75	93	57	A180400575000	4,85
5,8	93	57	A180400580000	5,14
5,9	93	57	A180400590000	5,14
6	93	57	A180400600000	4,59
6,1	101	63	A180400610000	5,67
6,2	101	63	A180400620000	5,67
6,25	101	63	A180400625000	5,35
6,3	101	63	A180400630000	5,67
6,4	101	63	A180400640000	5,72
6,5	101	63	A180400650000	5,51
6,6	101	63	A180400660000	6,79
6,7	101	63	A180400670000	6,79
6,75	109	69	A180400675000	6,38
6,8	109	69	A180400680000	6,41
6,9	109	69	A180400690000	6,83
7	109	69	A180400700000	6,01
7,1	109	69	A180400710000	8,63
7,2	109	69	A180400720000	8,63
7,25	109	69	A180400725000	8,07
7,3	109	69	A180400730000	8,56
7,4	109	69	A180400740000	8,56
7,5	109	69	A180400750000	6,42
7,6	117	75	A180400760000	10,37
7,7	117	75	A180400770000	10,41
7,75	117	75	A180400775000	9,68
7,8	117	75	A180400780000	10,46
7,9	117	75	A180400790000	10,41
8	117	75	A180400800000	7,51
8,1	117	75	A180400810000	10,02
8,2	117	75	A180400820000	10,02
8,25	117	75	A180400825000	9,42
8,3	117	75	A180400830000	10,02
8,4	117	75	A180400840000	10,02
8,5	117	75	A180400850000	7,87
8,6	125	81	A180400860000	12,66
8,7	125	81	A180400870000	12,66
8,75	125	81	A180400875000	11,83
8,8	125	81	A180400880000	12,66
8,9	125	81	A180400890000	12,66
9	125	81	A180400900000	9,98
9,1	125	81	A180400910000	14,08
9,2	125	81	A180400920000	14,08
9,25	125	81	A180400925000	12,93
9,3	125	81	A180400930000	14,08
9,4	125	81	A180400940000	14,08
9,5	125	81	A180400950000	10,33
9,6	133	87	A180400960000	16,58

180.40
DIN 338

Classic series
HSSCo 5%

Type NF
5 x D

Jobber drills
Straight shank drills

D	L	l	Code	Price
mm.	mm.	mm.		€
9,7	133	87	**A180400970000**	**16,58**
9,75	133	87	**A180400975000**	**15,35**
9,8	133	87	**A180400980000**	**16,58**
9,9	133	87	**A180400990000**	**16,58**
10	133	87	**A180401000000**	**11,38**
10,2	133	87	**A180401020000**	**16,27**
10,25	133	87	**A180401025000**	**19,74**
10,5	133	87	**A180401050000**	**15,77**
10,75	142	94	**A180401075000**	**23,00**
11	142	94	**A180401100000**	**17,73**
11,25	142	94	**A180401125000**	**26,07**
11,5	142	94	**A180401150000**	**21,12**
11,75	142	94	**A180401175000**	**27,00**
12	151	101	**A180401200000**	**22,72**
12,5	151	101	**A180401250000**	**27,97**
13	151	101	**A180401300000**	**29,04**
13,5	160	108	**A180401350000**	**31,99**
14	160	108	**A180401400000**	**31,48**
14,25	169	114	**A180401425000**	**52,99**
14,5	169	114	**A180401450000**	**44,85**
15	169	114	**A180401500000**	**45,33**
15,5	178	120	**A180401550000**	**52,67**
16	178	120	**A180401600000**	**54,14**

Cutting conditions and recommended material

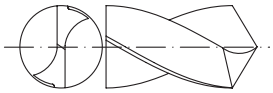
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
3	25	30	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
4	15	20	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	10	16	(A)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
6	14	14	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
7	8	12,5	(A) (B)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
8	6,3	10	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
10	4	6	(A) (B)	0,030	0,030	0,040	0,050	0,060	0,080	0,080	0,100	0,130	0,160	0,180	0,200
13.1	30	35	(B) (A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
13.2	22	32	(B) (A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

107.30
DIN 338

Classic series HSS | Type H 5 x D



Slow helix. Jobber drills
Straight shank drills

Design and technical specifications

Helix angle	Slow Helix (DIN 1414 type H)
Point angle	118º
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Flutes wider than normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

Details and applications

This is a drill designed with wide flutes which offers plenty of room for chip. Especially recommended for working in materials with small chip-hard, brittle and crumbly materials. Use to drill: Brittle brass (<60%Cu), naval, discontinuous swarf-Bronze, phosphor bronze-Magnesium alloys-Slate, marble-Mica-Thin, rigid insulaTiNg materials-Hard rubbers (ebonite, vulcanite…) Synthetic resins (Bakelite, galelithe-artificial horn...)-Plastic laminates (Perspex...)-Hard duroplastics in general-Thin fibre, celluloid, Plexiglas, electron, zamak-Asbestos cement sheeting- Hardboard and similar products (against the fibre).

D	L	l	Code	Price
mm.	mm.	mm.		€
1	34	12	**A107300100000**	**2,44**
1,25	38	16	**A107300125000**	**2,75**
1,5	40	18	**A107300150000**	**2,42**
1,75	46	22	**A107300175000**	**2,81**
2	49	24	**A107300200000**	**2,19**
2,1	49	24	**A107300210000**	**2,37**
2,2	53	27	**A107300220000**	**2,37**
2,25	53	27	**A107300225000**	**2,55**
2,5	57	30	**A107300250000**	**2,22**
2,6	57	30	**A107300260000**	**2,70**
2,75	61	33	**A107300275000**	**3,01**
3	61	33	**A107300300000**	**2,44**
3,1	65	36	**A107300310000**	**3,00**
3,2	65	36	**A107300320000**	**3,00**
3,25	65	36	**A107300325000**	**3,01**
3,5	70	39	**A107300350000**	**2,62**
3,75	70	39	**A107300375000**	**3,88**
4	75	43	**A107300400000**	**2,84**
4,25	75	43	**A107300425000**	**4,24**
4,5	80	47	**A107300450000**	**3,49**
4,75	80	47	**A107300475000**	**4,77**
5	86	52	**A107300500000**	**3,79**
5,5	93	57	**A107300550000**	**4,58**
6	93	57	**A107300600000**	**4,97**
6,5	101	63	**A107300650000**	**5,53**
7	109	69	**A107300700000**	**5,83**
7,5	109	69	**A107300750000**	**6,88**
8	117	75	**A107300800000**	**7,31**
8,5	117	75	**A107300850000**	**8,48**
9	125	81	**A107300900000**	**8,92**
9,5	125	81	**A107300950000**	**10,45**
10	133	87	**A107301000000**	**10,90**

Cutting conditions and recommended material

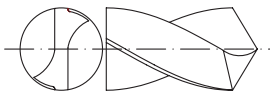
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
15	50	80	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
21	63	80	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
22	80	100	(C)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
25	25	32	(E)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
26	16	25	(C) (D)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220
27	16	31,5	(D)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
29	2,5	5	(D)	MANUAL										

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

108.30
DIN 338

Classic series | Type W
HSS | 5 x D



Quick helix. Jobber drills
Straight shank drills

Design and technical specifications

Helix angle	Quick Helix (DIN 14141 type W)
Point angle	130º
Point grinding	Relieved cone
Web thickness	Normal
Web taper	None
Flute form	Flutes wider than normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

Details and applications

A drill designed with wide polished flutes for easy and rapid chip removal. Especially appropriate for working soft materials with long chip. For drilling: ALUMINIUM and its alloys- Silumin or alpax- Zink-Refined copper-Soft thermoplastics in general-Nylon, polystyrene- Thicker Plexiglas, celluloid, electron, zamak-Wood-Hardboard and similar products (with the fibre)- Light metals with broken swarf(silicon alloys)-for holes deeper than 5 times the drill diameter.

D	L	l	Code	Price
mm.	mm.	mm.		€
1	34	12	**A108300100000**	**2,14**
1,5	40	18	**A108300150000**	**2,08**
2	49	24	**A108300200000**	**2,00**
2,5	57	30	**A108300250000**	**2,01**
2,6	57	30	**A108300260000**	**2,70**
2,7	61	33	**A108300270000**	**2,70**
3	61	33	**A108300300000**	**2,07**
3,2	65	36	**A108300320000**	**2,54**
3,25	65	36	**A108300325000**	**2,54**
3,3	65	36	**A108300330000**	**2,54**
3,4	70	39	**A108300340000**	**3,00**
3,5	70	39	**A108300350000**	**2,38**
3,6	70	39	**A108300360000**	**3,21**
3,8	75	43	**A108300380000**	**3,47**
3,9	75	43	**A108300390000**	**3,47**
4	75	43	**A108300400000**	**2,55**
4,1	75	43	**A108300410000**	**3,12**
4,2	75	43	**A108300420000**	**3,12**
4,3	80	47	**A108300430000**	**3,84**
4,5	80	47	**A108300450000**	**2,98**
5	86	52	**A108300500000**	**3,21**
5,1	86	52	**A108300510000**	**3,96**
5,2	86	52	**A108300520000**	**5,00**
5,25	86	52	**A108300525000**	**4,30**
5,3	86	52	**A108300530000**	**5,00**

D	L	l	Code	Price
mm.	mm.	mm.		€
5,5	93	57	**A108300550000**	**3,98**
6	93	57	**A108300600000**	**4,26**
6,1	101	63	**A108300610000**	**6,35**
6,5	101	63	**A108300650000**	**4,88**
6,8	109	69	**A108300680000**	**5,99**
7	109	69	**A108300700000**	**5,27**
7,5	109	69	**A108300750000**	**5,85**
8	117	75	**A108300800000**	**6,60**
8,5	117	75	**A108300850000**	**7,19**
9	125	81	**A108300900000**	**8,50**
9,5	125	81	**A108300950000**	**9,15**
10	133	87	**A108301000000**	**9,93**
10,5	133	87	**A108301050000**	**12,84**
11	142	94	**A108301100000**	**14,25**
11,5	142	94	**A108301150000**	**17,00**
12	151	101	**A108301200000**	**18,27**
12,5	151	101	**A108301250000**	**20,25**
13	151	101	**A108301300000**	**20,59**
13,5	160	108	**A108301350000**	**37,25**
14	160	108	**A108301400000**	**32,77**
14,5	169	114	**A108301450000**	**44,30**
15	169	114	**A108301500000**	**37,77**
15,5	178	120	**A108301550000**	**55,65**
16	178	120	**A108301600000**	**47,51**

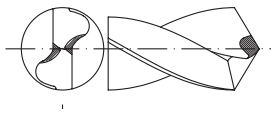
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
18	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
21	50	63	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
22	80	100	(C)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
23	63	100	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24	40	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
25	25	32	(E)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
26	16	25	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

109.30
DIN 338



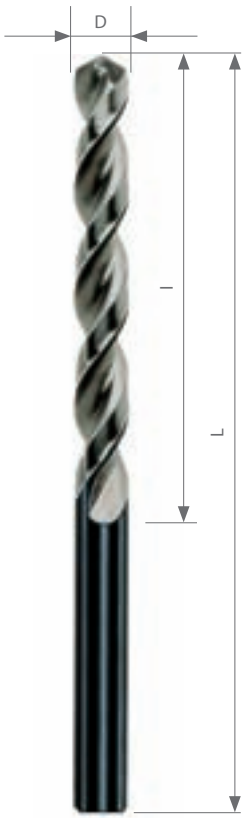
Classic series HSS | Type NV 5 x D

Jobber drills. Worm pattern

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

This robust drill (with reinforced web and wide flutes) is specially appropriate for drilling deep holes in difficult conditions, where chip removal and lubrication of the edge make working difficult .To be used when the hole deepness is not higher than 5 x D. Use to drill: Steel and cast steel, alloyed and non alloyed, up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings- Not recommended for nickel-chrome steels or similar materials).

D	L	l	Code	Price
mm.	mm.	mm.		€
1	34	12	A109300100000	3,68
1,1	36	14	A109300110000	3,54
1,2	38	16	A109300120000	3,54
1,25	38	16	A109300125000	3,54
1,3	38	16	A109300130000	3,54
1,4	40	18	A109300140000	3,54
1,5	40	18	A109300150000	3,54
1,6	43	20	A109300160000	3,45
1,7	43	20	A109300170000	3,45
1,75	46	22	A109300175000	3,45
1,8	46	22	A109300180000	3,45
1,9	46	22	A109300190000	3,31
2	49	24	A109300200000	3,03
2,1	49	24	A109300210000	3,03
2,2	53	27	A109300220000	3,03
2,25	53	27	A109300225000	3,03
2,3	53	27	A109300230000	3,03
2,4	57	30	A109300240000	3,03
2,5	57	30	A109300250000	3,03
2,6	57	30	A109300260000	3,44
2,7	61	33	A109300270000	3,44
2,75	61	33	A109300275000	3,44
2,8	61	33	A109300280000	3,44
2,9	61	33	A109300290000	3,44
3	61	33	A109300300000	3,44
3,1	65	36	A109300310000	3,83
3,2	65	36	A109300320000	3,83
3,25	65	36	A109300325000	3,76
3,3	65	36	A109300330000	3,68
3,4	70	39	A109300340000	3,83
3,5	70	39	A109300350000	3,76
3,6	70	39	A109300360000	4,10
3,7	70	39	A109300370000	4,10
3,75	70	39	A109300375000	4,42
3,8	75	43	A109300380000	4,42
3,9	75	43	A109300390000	4,42
4	75	43	A109300400000	4,42
4,1	75	43	A109300410000	4,90
4,2	75	43	A109300420000	4,90
4,25	75	43	A109300425000	4,99
4,3	80	47	A109300430000	4,90
4,4	80	47	A109300440000	4,90
4,5	80	47	A109300450000	4,99
4,6	80	47	A109300460000	5,24
4,7	80	47	A109300470000	5,24
4,75	80	47	A109300475000	5,24
4,8	86	52	A109300480000	5,07
4,9	86	52	A109300490000	5,24

D	L	l	Code	Price
mm.	mm.	mm.		€
5	86	52	A109300500000	5,24
5,1	86	52	A109300510000	6,37
5,2	86	52	A109300520000	6,37
5,25	86	52	A109300525000	6,37
5,3	86	52	A109300530000	6,37
5,4	93	57	A109300540000	6,63
5,5	93	57	A109300550000	6,37
5,6	93	57	A109300560000	6,87
5,7	93	57	A109300570000	6,87
5,75	93	57	A109300575000	6,87
5,8	93	57	A109300580000	6,87
5,9	93	57	A109300590000	6,87
6	93	57	A109300600000	6,87
6,1	101	63	A109300610000	8,10
6,2	101	63	A109300620000	8,10
6,3	101	63	A109300630000	8,10
6,4	101	63	A109300640000	8,50
6,5	101	63	A109300650000	8,10
6,6	101	63	A109300660000	9,72
6,7	101	63	A109300670000	9,72
6,8	109	69	A109300680000	8,39
6,9	109	69	A109300690000	8,39
7	109	69	A109300700000	8,39
7,1	109	69	A109300710000	12,30
7,2	109	69	A109300720000	12,30
7,3	109	69	A109300730000	12,30
7,4	109	69	A109300740000	12,44
7,5	109	69	A109300750000	9,48
7,6	117	75	A109300760000	14,76
7,7	117	75	A109300770000	14,18
7,8	117	75	A109300780000	14,83
8	117	75	A109300800000	10,77
8,5	117	75	A109300850000	12,22
9	125	81	A109300900000	12,88
9,5	125	81	A109300950000	14,76
10	133	87	A109301000000	14,76
10,5	133	87	A109301050000	19,52
11	142	94	A109301100000	20,10
11,5	142	94	A109301150000	25,23
12	151	101	A109301200000	26,54
12,5	151	101	A109301250000	31,76
13	151	101	A109301300000	30,96
13,5	160	108	A109301350000	40,20
14	160	108	A109301400000	35,36
14,5	169	114	A109301450000	47,80
15	169	114	A109301500000	40,75
15,5	178	120	A109301550000	60,05
16	178	120	A109301600000	49,87

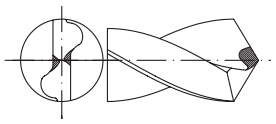
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	32	45	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
2	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
3	20	31,5	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
4	16	25	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
5	10	14	(A)	0,030	0,040	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250
13.1	31,5	40	(C)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
13.2	25	31,5	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
16	40	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
17	32	50	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
19	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400
20	16	30	(B)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310
26	20	31,5	(D)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500
30	3	6,25	(D)	MANUAL											

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

111.30
DIN 338



Classic series HSS | Type WV 5 x D

Jobber drills. Worm pattern. Quick helix

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	No surface treatment, bright finish

Details and applications

This drill with wide and polished flutes are suitable for rapid and easy removal of chip. They are designed especially for drilling deep holes (more than 3 x D) in soft materials with long, stringy swarf, with a maximum hardness of 500 N/mm^2. Use to drill: Mild steel-Aluminium and its alloys-Aluminium castings-Silumin, alpax, etc. Zinc-Refined copper-Soft plastics (thermoplastics) in general-Nylon-Wood-Hardboard and similar products (with the fibre).

D	L	l	Code	Price
mm.	mm.	mm.		€
2	49	24	**A111300200000**	**3,03**
2,1	49	24	**A111300210000**	**3,03**
2,2	53	27	**A111300220000**	**3,03**
2,25	53	27	**A111300225000**	**3,03**
2,3	53	27	**A111300230000**	**3,03**
2,4	57	30	**A111300240000**	**3,03**
2,5	57	30	**A111300250000**	**3,03**
2,6	57	30	**A111300260000**	**3,44**
2,7	61	33	**A111300270000**	**3,44**
2,8	61	33	**A111300280000**	**3,44**
2,9	61	33	**A111300290000**	**3,44**
3	61	33	**A111300300000**	**3,44**
3,1	65	36	**A111300310000**	**3,83**
3,2	65	36	**A111300320000**	**3,83**
3,3	65	36	**A111300330000**	**3,68**
3,4	70	39	**A111300340000**	**3,83**
3,5	70	39	**A111300350000**	**3,76**
3,6	70	39	**A111300360000**	**4,10**
3,7	70	39	**A111300370000**	**4,10**
3,8	75	43	**A111300380000**	**4,42**
3,9	75	43	**A111300390000**	**4,42**

D	L	l	Code	Price
mm.	mm.	mm.		€
4	75	43	**A111300400000**	**4,42**
4,1	75	43	**A111300410000**	**4,90**
4,2	75	43	**A111300420000**	**4,90**
4,3	80	47	**A111300430000**	**4,90**
4,4	80	47	**A111300440000**	**4,90**
4,5	80	47	**A111300450000**	**4,99**
4,6	80	47	**A111300460000**	**5,24**
4,7	80	47	**A111300470000**	**5,24**
4,8	86	52	**A111300480000**	**5,07**
4,9	86	52	**A111300490000**	**5,24**
5	86	52	**A111300500000**	**5,24**
5,1	86	52	**A111300510000**	**6,37**
5,2	86	52	**A111300520000**	**6,37**
5,3	86	52	**A111300530000**	**6,37**
5,4	93	57	**A111300540000**	**6,63**
5,5	93	57	**A111300550000**	**6,37**
5,6	93	57	**A111300560000**	**6,87**
5,7	93	57	**A111300570000**	**6,87**
5,8	93	57	**A111300580000**	**6,87**
5,9	93	57	**A111300590000**	**6,87**
6	93	57	**A111300600000**	**6,87**

Cutting conditions and recommended material

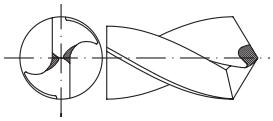
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill										
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20
1	25	40	(A)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280
18	25	40	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
21	50	63	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
22	80	100	(C)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
23	63	100	(A)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
24	40	63	(A)	0,060	0,080	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450
25	25	32	(E)	0,050	0,060	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350
26	16	25	(D)	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

115.30
DIN 340

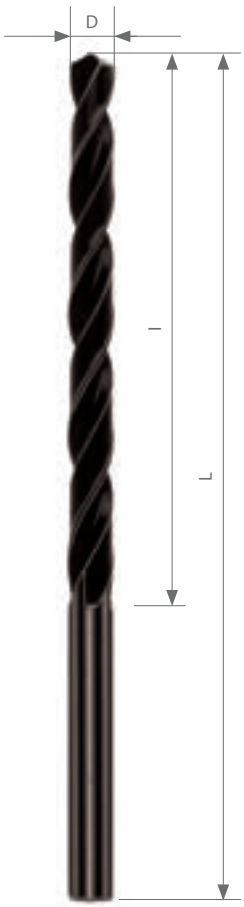
Classic series HSS | Type N 10 x D



Taper length
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Slightly heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)



Details and applications

This drill responds to the demand for long series drills for deep hole drilling in a wide range of applications and in work requiring the use of a guide bush. For deep continued holes we recommend our family 118.30 and for a high performance our Optimus families 184.43 and 184.44. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to 900 N/mm^2- Grey cast iron- Malleable cast iron- Pressure casting- Sintered iron- German silver- Graphite-Phosphor bronze for bearings-Bronze alloys of aluminium, lead, manganese, or silicon-Soft brass (≥60% Cu), continuous swarf-Electrolytic copper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
0,5	32	12	A115300050000	9,80
0,6	35	15	A115300060000	7,94
0,7	42	21	A115300070000	7,43
0,8	46	25	A115300080000	7,40
0,9	51	29	A115300090000	7,27
1	56	33	A115300100000	7,08
1,1	60	37	A115300110000	7,00
1,2	65	41	A115300120000	7,00
1,25	65	41	A115300125000	7,12
1,3	65	41	A115300130000	7,00
1,4	70	45	A115300140000	7,00
1,5	70	45	A115300150000	5,08
1,6	76	50	A115300160000	7,00
1,7	76	50	A115300170000	6,91
1,75	80	53	A115300175000	5,69
1,8	80	53	A115300180000	5,58
1,9	80	53	A115300190000	5,58
2	85	56	A115300200000	3,67
2,1	85	56	A115300210000	5,51
2,2	90	59	A115300220000	5,51
2,3	90	59	A115300230000	5,31
2,4	95	62	A115300240000	5,31
2,5	95	62	A115300250000	4,05
2,6	95	62	A115300260000	5,45
2,7	100	66	A115300270000	5,45
2,75	100	66	A115300275000	5,57
2,8	100	66	A115300280000	5,45
2,9	100	66	A115300290000	5,45
3	100	66	A115300300000	3,75
3,1	106	69	A115300310000	4,34
3,2	106	69	A115300320000	4,34
3,25	106	69	A115300325000	4,33
3,3	106	69	A115300330000	4,34
3,4	112	73	A115300340000	5,57
3,5	112	73	A115300350000	4,04
3,6	112	73	A115300360000	5,57
3,7	112	73	A115300370000	5,57
3,75	112	73	A115300375000	5,71
3,8	119	78	A115300380000	6,87
3,9	119	78	A115300390000	6,87
4	119	78	A115300400000	4,40
4,1	119	78	A115300410000	5,78
4,2	119	78	A115300420000	5,78
4,25	119	78	A115300425000	5,78
4,3	126	82	A115300430000	7,46
4,4	126	82	A115300440000	7,46
4,5	126	82	A115300450000	5,23
4,6	126	82	A115300460000	7,44
4,7	126	82	A115300470000	7,49
4,75	126	82	A115300475000	7,73
4,8	132	87	A115300480000	8,58
4,9	132	87	A115300490000	8,58
5	132	87	A115300500000	5,61
5,1	132	87	A115300510000	8,62
5,2	132	87	A115300520000	8,62
5,25	132	87	A115300525000	8,87
5,3	132	87	A115300530000	9,35
5,4	139	91	A115300540000	9,44
5,5	139	91	A115300550000	7,41
5,6	139	91	A115300560000	9,40
5,7	139	91	A115300570000	9,40
5,75	139	91	A115300575000	9,70
5,8	139	91	A115300580000	10,27
5,9	139	91	A115300590000	10,27
6	139	91	A115300600000	6,88

D	L	l	Code	Price
mm.	mm.	mm.		€
6,1	148	97	A115300610000	10,32
6,2	148	97	A115300620000	10,32
6,25	148	97	A115300625000	10,67
6,3	148	97	A115300630000	10,42
6,4	148	97	A115300640000	10,42
6,5	148	97	A115300650000	8,79
6,6	148	97	A115300660000	10,42
6,7	148	97	A115300670000	10,42
6,75	156	102	A115300675000	10,76
6,8	156	102	A115300680000	10,76
6,9	156	102	A115300690000	11,08
7	156	102	A115300700000	10,22
7,1	156	102	A115300710000	11,03
7,2	156	102	A115300720000	11,03
7,25	156	102	A115300725000	11,41
7,3	156	102	A115300730000	11,24
7,4	156	102	A115300740000	11,24
7,5	156	102	A115300750000	10,86
7,6	165	109	A115300760000	11,24
7,7	165	109	A115300770000	11,24
7,75	165	109	A115300775000	11,68
7,8	165	109	A115300780000	12,57
7,9	165	109	A115300790000	12,57
8	165	109	A115300800000	12,17
8,1	165	109	A115300810000	12,57
8,2	165	109	A115300820000	12,57
8,25	165	109	A115300825000	13,07
8,3	165	109	A115300830000	19,27
8,4	165	109	A115300840000	19,43
8,5	165	109	A115300850000	13,48
8,6	175	115	A115300860000	19,62
8,7	175	115	A115300870000	19,62
8,75	175	115	A115300875000	20,02
8,8	175	115	A115300880000	19,78
8,9	175	115	A115300890000	19,78
9	175	115	A115300900000	14,64
9,1	175	115	A115300910000	20,06
9,2	175	115	A115300920000	20,06
9,25	175	115	A115300925000	20,46
9,3	175	115	A115300930000	21,27
9,4	175	115	A115300940000	21,27
9,5	175	115	A115300950000	14,88
9,6	184	121	A115300960000	21,57
9,7	184	121	A115300970000	21,27
9,75	184	121	A115300975000	21,99
9,8	184	121	A115300980000	21,57
9,9	184	121	A115300990000	21,27
10	184	121	A115301000000	15,86
10,2	184	121	A115301020000	21,81
10,25	184	121	A115301025000	19,83
10,5	184	121	A115301050000	21,63
10,75	195	128	A115301075000	21,99
11	195	128	A115301100000	24,04
11,25	195	128	A115301125000	28,86
11,5	195	128	A115301150000	24,76
11,75	195	128	A115301175000	32,47
12	205	134	A115301200000	27,66
12,5	205	134	A115301250000	29,13
13	205	134	A115301300000	33,05
13,5	214	140	A115301350000	36,88
14	214	140	A115301400000	39,81
14,5	220	144	A115301450000	46,61
15	220	144	A115301500000	45,12
15,5	227	149	A115301550000	66,94
16	227	149	A115301600000	51,72

Cutting conditions and recommended material

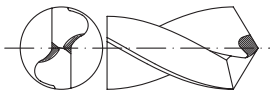
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	20	32	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
2	16	25,2	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
3	12,8	20	(A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
4	10	16	(A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
13.1	20	28	(A) (B)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
13.2	16	20	(A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
26	12,8	20	(D)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

118.30
DIN 340

Classic series HSS | Type NV 10 x D



Taper length. Worm pattern
Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes

Details and applications

Drills with reinforced web and wide flutes especially appropriate for drilling deep holes in difficult conditions, for drilling no more than 10 x D. For a higher performance we suggest our Optimus families 184.43 and 184.44. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings-(Not recommended for nickel-chrome steels or similar materials).

D	L	l	Code	Price
mm.	mm.	mm.		€
1	56	33	A118300100000	8,10
1,5	70	45	A118300150000	6,37
2	85	56	A118300200000	5,06
2,1	85	56	A118300210000	5,58
2,2	90	59	A118300220000	5,58
2,25	90	59	A118300225000	5,58
2,3	90	59	A118300230000	5,58
2,4	95	62	A118300240000	5,58
2,5	95	62	A118300250000	4,92
2,6	95	62	A118300260000	5,58
2,7	100	66	A118300270000	5,58
2,75	100	66	A118300275000	6,80
2,8	100	66	A118300280000	5,92
2,9	100	66	A118300290000	5,92
3	100	66	A118300300000	5,28
3,1	106	69	A118300310000	5,79
3,2	106	69	A118300320000	6,01
3,25	106	69	A118300325000	6,01
3,3	106	69	A118300330000	6,01
3,4	112	73	A118300340000	6,87
3,5	112	73	A118300350000	6,01
3,6	112	73	A118300360000	6,08
3,7	112	73	A118300370000	6,08
3,75	112	73	A118300375000	8,10
3,8	119	78	A118300380000	6,08
3,9	119	78	A118300390000	6,08
4	119	78	A118300400000	6,08
4,1	119	78	A118300410000	8,39
4,2	119	78	A118300420000	7,96
4,25	119	78	A118300425000	7,96
4,3	126	82	A118300430000	8,39
4,4	126	82	A118300440000	7,96
4,5	126	82	A118300450000	7,96
4,6	126	82	A118300460000	8,82
4,7	126	82	A118300470000	8,82
4,75	126	82	A118300475000	8,82
4,8	132	87	A118300480000	8,82
4,9	132	87	A118300490000	8,82
5	132	87	A118300500000	8,82
5,1	132	87	A118300510000	10,34
5,2	132	87	A118300520000	10,34
5,25	132	87	A118300525000	10,34
5,3	132	87	A118300530000	10,41
5,4	139	91	A118300540000	10,13
5,5	139	91	A118300550000	9,33
5,6	139	91	A118300560000	10,13
5,7	139	91	A118300570000	10,13
5,75	139	91	A118300575000	12,59
5,8	139	91	A118300580000	10,13

D	L	l	Code	Price
mm.	mm.	mm.		€
5,9	139	91	A118300590000	10,13
6	139	91	A118300600000	9,33
6,1	148	97	A118300610000	13,17
6,2	148	97	A118300620000	13,17
6,25	148	97	A118300625000	13,17
6,3	148	97	A118300630000	13,17
6,4	148	97	A118300640000	13,17
6,5	148	97	A118300650000	12,30
6,6	148	97	A118300660000	13,17
6,7	148	97	A118300670000	15,19
6,75	156	102	A118300675000	13,17
6,8	156	102	A118300680000	13,17
6,9	156	102	A118300690000	13,17
7	156	102	A118300700000	12,01
7,1	156	102	A118300710000	16,56
7,2	156	102	A118300720000	16,56
7,25	156	102	A118300725000	17,21
7,3	156	102	A118300730000	16,56
7,4	156	102	A118300740000	16,56
7,5	156	102	A118300750000	14,76
7,6	165	109	A118300760000	17,93
7,7	165	109	A118300770000	17,93
7,75	165	109	A118300775000	14,76
7,8	165	109	A118300780000	17,93
8	165	109	A118300800000	14,76
8,25	165	109	A118300825000	18,09
8,5	165	109	A118300850000	18,09
8,75	175	115	A118300875000	18,09
9	175	115	A118300900000	18,09
9,25	175	115	A118300925000	20,98
9,5	175	115	A118300950000	20,98
9,75	184	121	A118300975000	20,98
10	184	121	A118301000000	20,98
10,25	184	121	A118301025000	31,53
10,5	184	121	A118301050000	29,07
10,75	195	128	A118301075000	32,11
11	195	128	A118301100000	30,38
11,25	195	128	A118301125000	35,94
11,5	195	128	A118301150000	32,83
11,75	195	128	A118301175000	35,94
12	205	134	A118301200000	34,28
12,5	205	134	A118301250000	38,70
13	205	134	A118301300000	41,36
13,5	214	140	A118301350000	48,97
14	214	140	A118301400000	50,12
14,5	220	144	A118301450000	61,04
15	220	144	A118301500000	56,92
15,5	227	149	A118301550000	64,29
16	227	149	A118301600000	66,32

Cutting conditions and recommended material

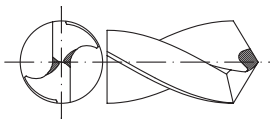
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	20	32	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
2	16	25,2	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
3	12,8	20	(A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
4	10	16	(A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
5	6,4	10	(B)	0,018	0,027	0,027	0,036	0,045	0,054	0,054	0,072	0,090	0,108	0,126	0,144
13.1	20	28	(C)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
13.2	16	20	(A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450
23	50,4	80	(A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
25	20	32	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

182.40
DIN 340

Classic series HSSCo 5 % | Type NF 10 x D



Taper length
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	135°
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Much heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated, golden-brown

Details and applications

The high strength at elevated temperatures of the cobalt high speed steel HSSCo and the design of the reinforced web in the whole length of the drill are characteristics which give to this drill its capacity for use in working with guide bushing on materials which are hard, strong and difficult to machine. It is our standard economic straight shank made of HSSCo. For high performance we suggest our Optimus families 184.43 and 184.44. Use to drill: Steel and cast steel, alloyed and non-alloyed over 900 N/mm^{2}to 1200N/mm^2.- Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-spheroidal cast iron.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	85	56	A182400200000	9,61
2,1	85	56	A182400210000	10,60
2,25	90	59	A182400225000	10,60
2,3	90	59	A182400230000	10,60
2,4	95	62	A182400240000	10,60
2,6	95	62	A182400260000	10,60
2,7	100	66	A182400270000	10,60
2,8	100	66	A182400280000	11,25
2,9	100	66	A182400290000	11,25
3	100	66	A182400300000	10,03
3,1	106	69	A182400310000	11,00
3,2	106	69	A182400320000	11,42
3,25	106	69	A182400325000	11,42
3,3	106	69	A182400330000	11,42
3,4	112	73	A182400340000	13,05
3,5	112	73	A182400350000	11,42
3,6	112	73	A182400360000	11,55
3,7	112	73	A182400370000	11,55
3,75	112	73	A182400375000	15,39
3,8	119	78	A182400380000	11,55
3,9	119	78	A182400390000	11,55
4	119	78	A182400400000	11,55
4,25	119	78	A182400425000	15,12
4,3	126	82	A182400430000	15,94
4,4	126	82	A182400440000	15,12
4,6	126	82	A182400460000	16,76
4,7	126	82	A182400470000	16,76
4,75	126	82	A182400475000	16,76
4,8	132	87	A182400480000	16,76
4,9	132	87	A182400490000	16,76
5,1	132	87	A182400510000	19,65
5,2	132	87	A182400520000	19,65
5,25	132	87	A182400525000	19,65
5,3	132	87	A182400530000	19,78
5,4	139	91	A182400540000	19,25
5,5	139	91	A182400550000	17,73
5,6	139	91	A182400560000	19,25
5,7	139	91	A182400570000	19,25
5,75	139	91	A182400575000	23,92
5,8	139	91	A182400580000	19,25
5,9	139	91	A182400590000	19,25
6,1	148	97	A182400610000	25,02

D	L	l	Code	Price
mm.	mm.	mm.		€
6,2	148	97	A182400620000	25,02
6,25	148	97	A182400625000	25,02
6,3	148	97	A182400630000	25,02
6,4	148	97	A182400640000	25,02
6,5	148	97	A182400650000	25,02
6,6	148	97	A182400660000	25,02
6,7	148	97	A182400670000	28,86
6,75	156	102	A182400675000	25,02
6,8	156	102	A182400680000	25,02
6,9	156	102	A182400690000	25,02
7	156	102	A182400700000	22,82
7,1	156	102	A182400710000	31,46
7,2	156	102	A182400720000	31,46
7,25	156	102	A182400725000	32,70
7,3	156	102	A182400730000	31,46
7,4	156	102	A182400740000	31,46
7,5	156	102	A182400750000	28,04
7,6	165	109	A182400760000	34,07
7,7	165	109	A182400770000	34,07
7,75	165	109	A182400775000	28,04
8,5	165	109	A182400850000	34,37
8,75	175	115	A182400875000	34,37
9	175	115	A182400900000	34,37
9,25	175	115	A182400925000	39,86
9,5	175	115	A182400950000	39,86
9,75	184	121	A182400975000	39,86
10,25	184	121	A182401025000	59,91
10,5	184	121	A182401050000	55,23
10,75	195	128	A182401075000	61,01
11	195	128	A182401100000	57,72
11,25	195	128	A182401125000	68,29
11,5	195	128	A182401150000	62,38
11,75	195	128	A182401175000	68,29
12	205	134	A182401200000	65,13
12,5	205	134	A182401250000	73,53
13	205	134	A182401300000	78,58
13,5	214	140	A182401350000	93,04
14	214	140	A182401400000	95,23
15	220	144	A182401500000	108,15
15,5	227	149	A182401550000	122,15
16	227	149	A182401600000	126,01

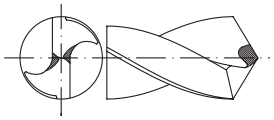
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
3	20	24	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
4	12	16	(A)	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225	0,252	0,279
5	8	13	(A)	0,027	0,027	0,036	0,045	0,054	0,072	0,072	0,090	0,117	0,144	0,162	0,180
6	11	11	(A)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
7	6,5	10	(A) (B)	0,027	0,036	0,045	0,054	0,072	0,090	0,090	0,117	0,144	0,180	0,198	0,225
8	5	8	(A) (B)	0,027	0,027	0,036	0,045	0,054	0,072	0,072	0,090	0,117	0,144	0,162	0,180
10	3,25	4,75	(A) (B)	0,027	0,027	0,036	0,045	0,054	0,072	0,072	0,090	0,117	0,144	0,162	0,180
13.1	24	28	(B) (A)	0,045	0,054	0,072	0,090	0,117	0,144	0,162	0,180	0,225	0,279	0,315	0,360
13.2	17,5	25,5	(B) (A)	0,054	0,072	0,090	0,117	0,144	0,180	0,198	0,225	0,279	0,360	0,405	0,450

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

121.30
DIN 1869/1

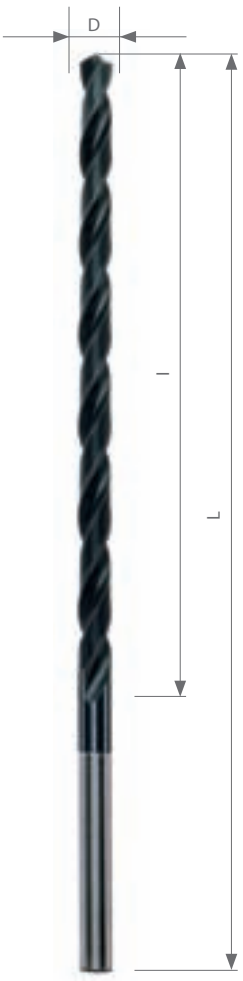


Classic series | Type N
HSS | 15 x D

Extra length drills. Series 1
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)



Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 124.40. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 700 N/mm^2- Grey cast iron- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
2	125	85	**A121300200000**	**9,83**
2,5	140	95	**A121300250000**	**9,97**
3	150	100	**A121300300000**	**10,85**
3,5	165	115	**A121300350000**	**11,29**
4	175	120	**A121300400000**	**11,22**
4,5	185	125	**A121300450000**	**12,3**
5	195	135	**A121300500000**	**12,88**
5,5	205	140	**A121300550000**	**14,68**
6	205	140	**A121300600000**	**15,04**
6,5	215	150	**A121300650000**	**18,81**
7	225	155	**A121300700000**	**21,05**
7,5	225	155	**A121300750000**	**25,68**
8	240	165	**A121300800000**	**27,69**
8,5	240	165	**A121300850000**	**35,23**
9	250	174	**A121300900000**	**38,56**
9,5	250	175	**A121300950000**	**43,68**
10	265	185	**A121301000000**	**40,36**
11	280	195	**A121301100000**	**62,78**
12	295	205	**A121301200000**	**74,94**

Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	17,5	28	(A)	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200	0,224	0,248
2	14	22	(A)	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200	0,224	0,248
3	11	17,5	(A)	0,024	0,032	0,040	0,048	0,064	0,080	0,080	0,104	0,128	0,160	0,176	0,200
4	8,75	14	(A)	0,024	0,032	0,040	0,048	0,064	0,080	0,080	0,104	0,128	0,160	0,176	0,200
13.1	17,5	24,5	(A) (B)	0,048	0,064	0,080	0,104	0,128	0,160	0,176	0,200	0,248	0,320	0,360	0,400
13.2	14	17,5	(A)	0,048	0,064	0,080	0,104	0,128	0,160	0,176	0,200	0,248	0,320	0,360	0,400

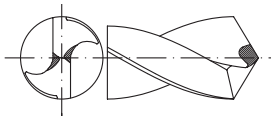
Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

122.30
DIN 1869/2

Classic series
HSS

Type N
20 x D



Extra length drills. Series 2
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)

Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 125.40. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 700 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
3	190	130	**A122300300000**	**14,04**
3,5	210	145	**A122300350000**	**14,83**
4	220	150	**A122300400000**	**14,25**
4,5	235	160	**A122300450000**	**17,29**
5	245	170	**A122300500000**	**16,50**
5,5	260	180	**A122300550000**	**21,56**
6	260	180	**A122300600000**	**22,21**
6,5	275	190	**A122300650000**	**24,67**
7	290	200	**A122300700000**	**29,01**
7,5	290	200	**A122300750000**	**33,56**
8	305	210	**A122300800000**	**34,28**
8,5	305	210	**A122300850000**	**45,78**
9	320	220	**A122300900000**	**47,89**
9,5	320	220	**A122300950000**	**56,64**
10	340	235	**A122301000000**	**54,45**
11	365	250	**A122301100000**	**75,37**
12	375	260	**A122301200000**	**91,63**

Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	17,5	28	(A)	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,175	0,196	0,217
2	14	22	(A)	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,175	0,196	0,217
3	11,2	17,5	(A)	0,021	0,028	0,035	0,042	0,056	0,070	0,070	0,091	0,112	0,140	0,154	0,175
4	8,75	14	(A)	0,021	0,028	0,035	0,042	0,056	0,070	0,070	0,091	0,112	0,140	0,154	0,175
13.1	17,5	24,5	(A) (B)	0,042	0,056	0,070	0,091	0,112	0,140	0,154	0,175	0,217	0,280	0,315	0,350
13.2	14	17,5	(A)	0,042	0,056	0,070	0,091	0,112	0,140	0,154	0,175	0,217	0,280	0,315	0,350

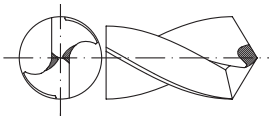
Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

123.30
DIN 1869/3

Classic series
HSS

Type N
30 x D



Extra length drills. Series 3
Straight shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated. Nitrided (D<2,5mm Bright Finish)

Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 126.40. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 700 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
3,5	265	180	**A123300350000**	**20,47**
4	280	190	**A123300400000**	**19,25**
4,5	295	200	**A123300450000**	**26,18**
5	315	210	**A123300500000**	**24,67**
5,5	330	225	**A123300550000**	**25,96**
6	330	225	**A123300600000**	**28,80**
6,5	350	235	**A123300650000**	**33,13**
7	370	250	**A123300700000**	**42,97**
7,5	370	250	**A123300750000**	**48,68**
8	390	265	**A123300800000**	**49,62**
8,5	390	265	**A123300850000**	**63,79**
9	410	280	**A123300900000**	**69,65**
9,5	410	280	**A123300950000**	**77,90**
10	430	295	**A123301000000**	**75,95**
11	455	310	**A123301100000**	**89,83**
12	480	330	**A123301200000**	**99,01**

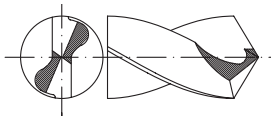
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	17,5	28	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168	0,186
2	14	22	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168	0,186
3	11	17,5	(A)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132	0,150
4	8,75	14	(A)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132	0,150
13.1	17,5	24,5	(A) (B)	0,036	0,048	0,060	0,078	0,096	0,120	0,132	0,150	0,186	0,240	0,270	0,300
13.2	14	17,5	(A)	0,036	0,048	0,060	0,078	0,096	0,120	0,132	0,150	0,186	0,240	0,270	0,300

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

124.30
DIN 1869/1



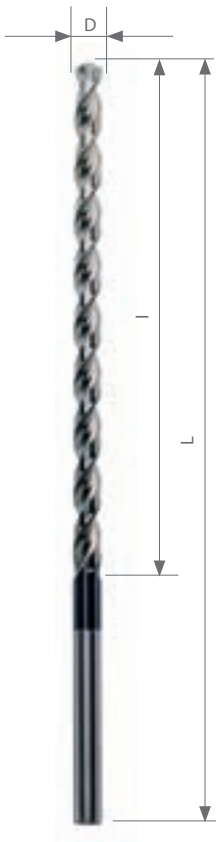
Classic series | Type NV
HSS | 15 x D

Extra length drills. Worm pattern. Series 1

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 124.40. Use to drill: Steel and cast steel, alloyed and non alloyed, up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings- Not recommended for nickel-chrome steels or similar materials).

D	L	l	Code	Price
mm.	mm.	mm.		€
2	125	85	**A124300200000**	**12,88**
2,5	140	95	**A124300250000**	**12,88**
3	150	100	**A124300300000**	**14,39**
3,5	165	115	**A124300350000**	**14,18**
4	175	120	**A124300400000**	**14,18**
4,5	185	125	**A124300450000**	**14,83**
5	195	135	**A124300500000**	**15,62**
5,5	205	140	**A124300550000**	**16,20**
6	205	140	**A124300600000**	**16,71**
6,5	215	150	**A124300650000**	**20,47**
7	225	155	**A124300700000**	**24,52**
7,5	225	155	**A124300750000**	**27,20**
8	240	165	**A124300800000**	**31,10**
8,5	240	165	**A124300850000**	**42,97**
9	250	175	**A124300900000**	**46,07**
9,5	250	175	**A124300950000**	**55,54**
10	265	185	**A124301000000**	**48,68**
10,5	265	185	**A124301050000**	**79,92**
11	280	195	**A124301100000**	**67,11**
12	295	205	**A124301200000**	**81,45**

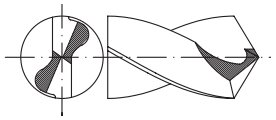
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill							
	From	To	Coolant	10	12,5	16	20	25	30	40	50
1	17,5	28	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280	0,350
2	14	22	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280	0,350
3	11	17,5	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217	0,280
4	8,75	14	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217	0,280
13.1	17,5	24,5	(A) (B)	0,175	0,217	0,280	0,315	0,350	0,392	0,441	0,560
13.2	14	17,5	(A)	0,175	0,217	0,280	0,315	0,350	0,392	0,441	0,560

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

125.30
DIN 1869/2



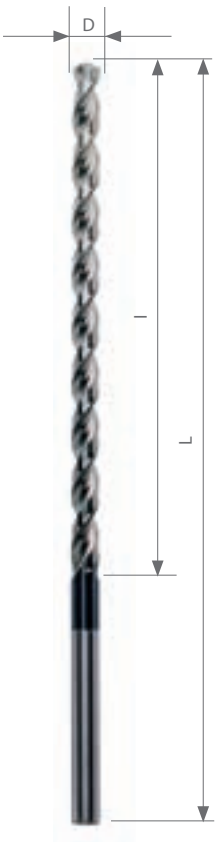
Classic series | Type NV
HSS | 20 x D

Extra length drills. Worm pattern. Series 2

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 125.40. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
3	190	130	**A125300300000**	**17,87**
3,5	210	145	**A125300350000**	**18,09**
4	220	150	**A125300400000**	**18,09**
4,5	235	160	**A125300450000**	**21,56**
5	245	170	**A125300500000**	**20,62**
5,5	260	180	**A125300550000**	**26,69**
6	260	180	**A125300600000**	**27,48**
6,5	275	190	**A125300650000**	**30,81**
7	290	200	**A125300700000**	**33,92**
7,5	290	200	**A125300750000**	**37,03**
8	305	210	**A125300800000**	**39,86**
8,5	305	210	**A125300850000**	**61,48**
9	320	220	**A125300900000**	**59,89**
9,5	320	220	**A125300950000**	**71,32**
10	340	235	**A125301000000**	**64,88**
10,5	340	235	**A125301050000**	**89,18**
11	365	250	**A125301100000**	**86,87**
12	375	260	**A125301200000**	**99,45**

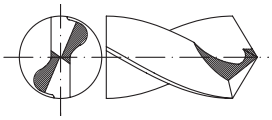
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	17,5	28	(A)	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,175	0,196	0,217
2	14	22	(A)	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,175	0,196	0,217
3	11	17,5	(A)	0,021	0,028	0,035	0,042	0,056	0,070	0,070	0,091	0,112	0,140	0,154	0,175
4	8,75	14	(A)	0,021	0,028	0,035	0,042	0,056	0,070	0,070	0,091	0,112	0,140	0,154	0,175
5	5,5	8,75	(B)	0,014	0,021	0,021	0,028	0,035	0,042	0,042	0,056	0,070	0,084	0,098	0,112
13.1	17,5	24,5	(C)	0,042	0,056	0,070	0,091	0,112	0,140	0,154	0,175	0,217	0,280	0,315	0,350
13.2	14	17,5	(A)	0,042	0,056	0,070	0,091	0,112	0,140	0,154	0,175	0,217	0,280	0,315	0,350
23	44	70	(A)	0,035	0,042	0,056	0,070	0,091	0,112	0,126	0,140	0,175	0,217	0,245	0,280
25	17,5	28	(A)	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,175	0,196	0,217

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

126.30
DIN 1869/3



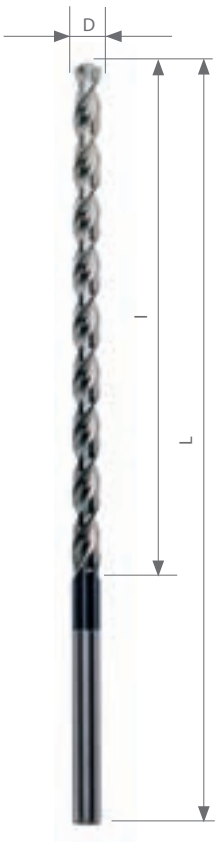
Classic series HSS | Type NV 30 x D

Extra length drills. Worm pattern. Series 3

Straight shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

Drill for drilling deep holes. Requires a thorough study in order to determine workholding methods, feeds and speeds to avoid vibration. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. For a high performance we suggest our Optimus family 126.40. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	Code	Price
mm.	mm.	mm.		€
3,5	265	180	**A126300350000**	**22,84**
4	280	190	**A126300400000**	**22,97**
4,5	295	200	**A126300450000**	**27,99**
5	315	210	**A126300500000**	**27,27**
5,5	330	225	**A126300550000**	**30,85**
6	330	225	**A126300600000**	**31,37**
6,5	350	235	**A126300650000**	**35,87**
7	370	250	**A126300700000**	**46,01**
7,5	370	250	**A126300750000**	**49,86**
8	390	265	**A126300800000**	**53,90**
8,5	390	265	**A126300850000**	**66,78**
9	410	280	**A126300900000**	**71,54**
9,5	410	280	**A126300950000**	**85,86**
10	430	295	**A126301000000**	**83,32**
10,5	430	295	**A126301050000**	**89,05**
11	455	310	**A126301100000**	**93,67**
12	480	330	**A126301200000**	**110,71**

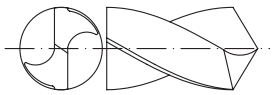
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill											
	From	To	Coolant	2	2,5	3	4	5	6	8	10	12,5	16	20	25
1	17,5	28	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168	0,186
2	14	22	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168	0,186
3	11	17,5	(A)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132	0,150
4	8,75	14	(A)	0,018	0,024	0,030	0,036	0,048	0,060	0,060	0,078	0,096	0,120	0,132	0,150
5	5,5	8,75	(B)	0,012	0,018	0,018	0,024	0,030	0,036	0,036	0,048	0,060	0,072	0,084	0,096
13.1	17,5	24,5	(C)	0,036	0,048	0,060	0,078	0,096	0,120	0,132	0,150	0,186	0,240	0,270	0,300
13.2	14	17,5	(A)	0,036	0,048	0,060	0,078	0,096	0,120	0,132	0,150	0,186	0,240	0,270	0,300
23	44	70	(A)	0,030	0,036	0,048	0,060	0,078	0,096	0,108	0,120	0,150	0,186	0,210	0,240
25	17,5	28	(A)	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,120	0,150	0,168	0,186

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

130.30
DIN 345

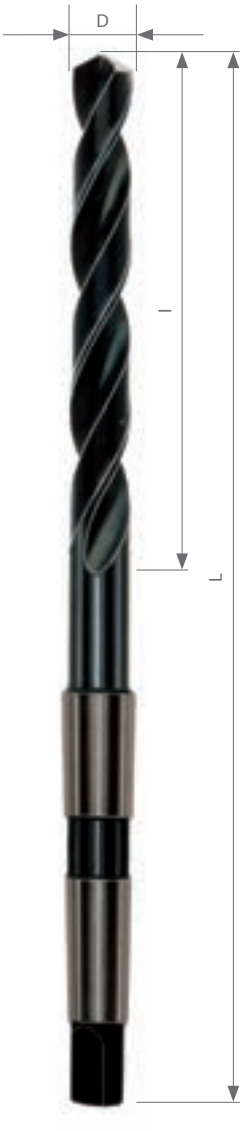


Classic series | Type N
HSS | 5 x D

Standard series drills
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated



Details and applications

The slender geometry and the strength of this tool, the surface treatment and its dimensional characteristics make this drill "the standard taper shank drill". It can be used in a wide range of applications. In this range of sizes it is our most economic family. Use to drill: Steel and cast steel, alloyed and non-alloyed, up to 900 N/mm^2- Grey cast iron- Malleable cast iron- Spheroidal cast iron-Pressure casting- Sintered iron-German silver-Graphite- Phosphor bronze for bearings-Bronze alloys of aluminium, lead, manganese or silicon - Soft brass (≥60% Cu), continuous swarf- Electrolytic copper-Zinc.

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
3	114	33	1	A130300300000	16,78
3,25	117	36	1	A130300325000	19,77
3,5	120	39	1	A130300350000	16,78
3,75	120	39	1	A130300375000	21,26
4	124	43	1	A130300400000	16,78
4,25	124	43	1	A130300425000	21,26
4,5	128	47	1	A130300450000	16,78
4,75	128	47	1	A130300475000	21,26
5	133	52	1	A130300500000	17,43
5,25	133	52	1	A130300525000	20,24
5,5	138	57	1	A130300550000	17,36
5,75	138	57	1	A130300575000	19,99
6	138	57	1	A130300600000	17,29
6,25	144	63	1	A130300625000	23,05
6,5	144	63	1	A130300650000	18,93
6,75	150	69	1	A130300675000	21,01
7	150	69	1	A130300700000	18,21
7,25	150	69	1	A130300725000	24,77
7,5	150	69	1	A130300750000	20,14
7,75	156	75	1	A130300775000	24,77
8	156	75	1	A130300800000	20,01
8,25	156	75	1	A130300825000	29,07
8,5	156	75	1	A130300850000	21,07
8,75	162	81	1	A130300875000	26,54
9	162	81	1	A130300900000	20,92
9,25	162	81	1	A130300925000	29,05
9,5	162	81	1	A130300950000	20,88
9,75	168	87	1	A130300975000	28,93
10	168	87	1	A130301000000	20,31
10,25	168	87	1	A130301025000	27,38
10,5	168	87	1	A130301050000	22,77
10,75	175	94	1	A130301075000	27,38
11	175	94	1	A130301100000	22,87
11,25	175	94	1	A130301125000	28,82
11,5	175	94	1	A130301150000	23,87
11,75	175	94	1	A130301175000	28,45
12	182	101	1	A130301200000	24,02
12,25	182	101	1	A130301225000	32,11
12,5	182	101	1	A130301250000	25,50
12,75	182	101	1	A130301275000	31,97
13	182	101	1	A130301300000	26,57
13,25	189	108	1	A130301325000	35,15
13,5	189	108	1	A130301350000	28,16
13,75	189	108	1	A130301375000	35,15
14	189	108	1	A130301400000	28,18
14,25	212	114	2	A130301425000	38,06
14,5	212	114	2	A130301450000	32,92
14,75	212	114	2	A130301475000	38,22
15	212	114	2	A130301500000	32,92
15,25	218	120	2	A130301525000	39,42
15,5	218	120	2	A130301550000	34,12
15,75	218	120	2	A130301575000	39,42
16	218	120	2	A130301600000	33,67
16,25	223	125	2	A130301625000	44,57
16,5	223	125	2	A130301650000	37,13
16,75	223	125	2	A130301675000	44,57
17	223	125	2	A130301700000	37,27
17,25	228	130	2	A130301725000	49,33
17,5	228	130	2	A130301750000	41,72
17,75	228	130	2	A130301775000	49,33

130.30
DIN 345

Classic series
HSS

Type N
5 x D

Standard series drills
Taper shank drills

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
18	228	130	2	A130301800000	39,33
18,25	233	135	2	A130301825000	54,25
18,5	233	135	2	A130301850000	44,88
18,75	233	135	2	A130301875000	54,25
19	233	135	2	A130301900000	45,34
19,25	238	140	2	A130301925000	59,07
19,5	238	140	2	A130301950000	49,70
19,75	238	140	2	A130301975000	59,07
20	238	140	2	A130302000000	49,91
20,25	243	145	2	A130302025000	61,10
20,5	243	145	2	A130302050000	51,74
20,75	243	145	2	A130302075000	61,10
21	243	145	2	A130302100000	51,74
21,25	248	150	2	A130302125000	67,42
21,5	248	150	2	A130302150000	57,06
21,75	248	150	2	A130302175000	67,42
22	248	150	2	A130302200000	57,35
22,25	248	150	2	A130302225000	73,77
22,5	253	155	2	A130302250000	63,01
22,75	253	155	2	A130302275000	73,77
23	253	155	2	A130302300000	64,02
23,25	276	155	3	A130302325000	81,38
23,5	276	155	3	A130302350000	68,79
23,75	281	160	3	A130302375000	81,43
24	281	160	3	A130302400000	69,00
24,25	281	160	3	A130302425000	87,14
24,5	281	160	3	A130302450000	75,28
24,75	281	160	3	A130302475000	88,78
25	281	160	3	A130302500000	75,13
25,25	286	165	3	A130302525000	96,69
25,5	286	165	3	A130302550000	81,64
25,75	286	165	3	A130302575000	96,57
26	286	165	3	A130302600000	81,74
26,25	286	165	3	A130302625000	104,57
26,5	286	165	3	A130302650000	88,52
26,75	291	170	3	A130302675000	104,57
27	291	170	3	A130302700000	87,52
27,25	291	170	3	A130302725000	111,92
27,5	291	170	3	A130302750000	94,76
27,75	291	170	3	A130302775000	111,92
28	291	170	3	A130302800000	94,14
28,25	296	175	3	A130302825000	119,03
28,5	296	175	3	A130302850000	101,61
28,75	296	175	3	A130302875000	120,06
29	296	175	3	A130302900000	101,20
29,25	296	175	3	A130302925000	131,99
29,5	296	175	3	A130302950000	111,35
29,75	296	175	3	A130302975000	131,99
30	296	175	3	A130303000000	110,94
30,25	301	180	3	A130303025000	150,27
30,5	301	180	3	A130303050000	127,92
30,75	301	180	3	A130303075000	148,93
31	301	180	3	A130303100000	124,30
31,25	301	180	3	A130303125000	157,71
31,5	301	180	3	A130303150000	134,33
31,75	306	185	3	A130303175000	157,71
32	334	185	4	A130303200000	131,68
32,5	334	185	4	A130303250000	155,50

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
33	334	185	4	A130303300000	150,38
33,5	334	185	4	A130303350000	167,93
34	339	190	4	A130303400000	163,53
34,5	339	190	4	A130303450000	184,00
35	339	190	4	A130303500000	176,30
35,5	339	190	4	A130303550000	195,70
36	344	195	4	A130303600000	190,40
36,5	344	195	4	A130303650000	206,85
37	344	195	4	A130303700000	201,66
37,5	344	195	4	A130303750000	218,95
38	349	200	4	A130303800000	211,97
38,5	349	200	4	A130303850000	232,50
39	349	200	4	A130303900000	225,04
39,5	349	200	4	A130303950000	242,83
40	349	200	4	A130304000000	235,99
40,5	354	205	4	A130304050000	256,95
41	354	205	4	A130304100000	254,94
41,5	354	205	4	A130304150000	286,04
42	354	205	4	A130304200000	286,80
42,5	354	205	4	A130304250000	300,96
43	359	210	4	A130304300000	300,11
43,5	359	210	4	A130304350000	315,01
44	359	210	4	A130304400000	314,25
44,5	359	210	4	A130304450000	327,77
45	359	210	4	A130304500000	329,18
45,5	364	215	4	A130304550000	342,74
46	364	215	4	A130304600000	341,81
46,5	364	215	4	A130304650000	356,02
47	364	215	4	A130304700000	356,52
47,5	364	215	4	A130304750000	369,17
48	369	220	4	A130304800000	367,99
48,5	369	220	4	A130304850000	381,82
49	369	220	4	A130304900000	382,42
49,5	369	220	4	A130304950000	396,39
50	369	220	4	A130305000000	395,37
50,5	374	225	4	A130305050000	466,93
51	412	225	5	A130305100000	467,66
52	412	225	5	A130305200000	498,51
53	412	225	5	A130305300000	533,28
54	417	230	5	A130305400000	589,63
55	417	230	5	A130305500000	581,49
56	417	230	5	A130305600000	654,57
57	422	235	5	A130305700000	693,98
58	422	235	5	A130305800000	698,11
59	422	235	5	A130305900000	719,27
60	422	235	5	A130306000000	685,80
61	427	240	5	A130306100000	800,12
62	427	240	5	A130306200000	834,85
63	427	240	5	A130306300000	883,95
64	432	245	5	A130306400000	932,90
65	432	245	5	A130306500000	896,21
66	432	245	5	A130306600000	1.007,45
67	432	245	5	A130306700000	1.038,59
68	437	250	5	A130306800000	1.064,52
69	437	250	5	A130306900000	1.100,70
70	437	250	5	A130307000000	1.041,35

Cutting conditions and recommended material

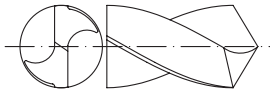
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill													
	From	To	Coolant	3	4	5	6	8	10	12,5	16	20	25	30	40	50	60	70
1	25	40	(A)	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800
2	20	31,5	(A)	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800
3	16	25	(A)	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250	0,280	0,310	0,400	0,500	0,630
4	12,5	20	(A)	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250	0,280	0,310	0,400	0,500	0,630
13.1	25	35	(A) (B)	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
13.2	20	25		0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
26	16	25		0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

130.34
DIN 345

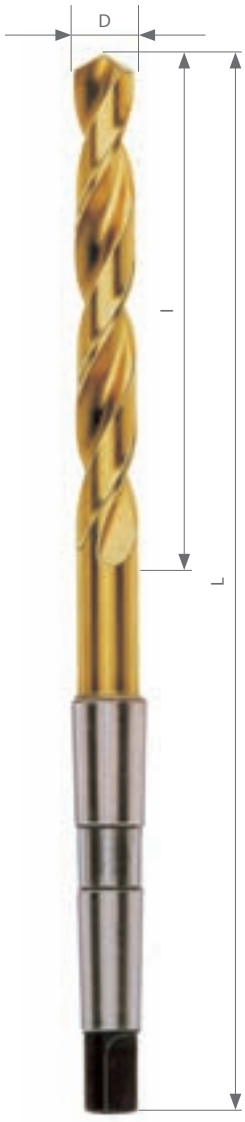
Classic series HSS | **Type N 5 x D** | **TiN**



Standard series drills
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Coated
Coating	TiN



Details and applications

Thanks to its Titanium coating, this drill offers a higher performance than our family 130.30 and it also allows an increase of the cutting conditions. Use to drill: Steel and cast steel, alloyed and non-alloyed, up to 900 N/mm^2- Grey cast iron- Malleable cast iron-Pressure casting- German silver- Graphite- phosphor bronze for bearings- Bronze alloys of aluminium, lead, magnesium or silicon-Soft brass (≥60% Cu) continuous swarf- Electrolytic copper-Zinc alloys with thin broken swarf (alloys of silicon).

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
3	114	33	1	**A130340300000**	**30,21**
3,25	117	36	1	**A130340325000**	**35,58**
3,5	120	39	1	**A130340350000**	**30,21**
3,75	120	39	1	**A130340375000**	**38,26**
4	124	43	1	**A130340400000**	**30,21**
4,25	124	43	1	**A130340425000**	**38,26**
4,5	128	47	1	**A130340450000**	**30,21**
4,75	128	47	1	**A130340475000**	**38,26**
5	133	52	1	**A130340500000**	**31,38**
5,25	133	52	1	**A130340525000**	**36,44**
5,5	138	57	1	**A130340550000**	**31,25**
5,75	138	57	1	**A130340575000**	**35,98**
6	138	57	1	**A130340600000**	**31,12**
6,25	144	63	1	**A130340625000**	**41,49**
6,5	144	63	1	**A130340650000**	**34,08**
6,75	150	69	1	**A130340675000**	**37,81**
7	150	69	1	**A130340700000**	**32,77**
7,25	150	69	1	**A130340725000**	**44,58**
7,5	150	69	1	**A130340750000**	**36,25**
7,75	156	75	1	**A130340775000**	**44,58**
8	156	75	1	**A130340800000**	**36,03**
8,25	156	75	1	**A130340825000**	**52,32**
8,5	156	75	1	**A130340850000**	**37,93**
8,75	162	81	1	**A130340875000**	**47,77**
9	162	81	1	**A130340900000**	**37,66**
9,25	162	81	1	**A130340925000**	**52,29**
9,5	162	81	1	**A130340950000**	**37,58**
9,75	168	87	1	**A130340975000**	**52,08**
10	168	87	1	**A130341000000**	**36,56**
10,25	168	87	1	**A130341025000**	**49,29**
10,5	168	87	1	**A130341050000**	**40,98**
10,75	175	94	1	**A130341075000**	**49,29**
11	175	94	1	**A130341100000**	**41,16**
11,25	175	94	1	**A130341125000**	**51,88**
11,5	175	94	1	**A130341150000**	**42,97**
11,75	175	94	1	**A130341175000**	**51,22**
12	182	101	1	**A130341200000**	**43,24**
12,25	182	101	1	**A130341225000**	**57,79**
12,5	182	101	1	**A130341250000**	**45,90**
12,75	182	101	1	**A130341275000**	**57,54**
13	182	101	1	**A130341300000**	**47,82**
13,25	189	108	1	**A130341325000**	**63,26**
13,5	189	108	1	**A130341350000**	**50,69**
13,75	189	108	1	**A130341375000**	**63,26**
14	189	108	1	**A130341400000**	**50,72**
14,25	212	114	2	**A130341425000**	**68,51**
14,5	212	114	2	**A130341450000**	**59,25**
14,75	212	114	2	**A130341475000**	**68,80**
15	212	114	2	**A130341500000**	**59,25**
15,25	218	120	2	**A130341525000**	**70,95**
15,5	218	120	2	**A130341550000**	**61,41**
15,75	218	120	2	**A130341575000**	**70,95**

130.34 DIN 345	Classic series HSS	Type N 5 x D	TiN	Standard series drills Taper shank drills

D	L	I	CM	Code	Price
mm.	mm.	mm.			€
16	218	120	2	**A130341600000**	**60,61**
16,25	223	125	2	**A130341625000**	**80,23**
16,5	223	125	2	**A130341650000**	**66,83**
16,75	223	125	2	**A130341675000**	**80,23**
17	223	125	2	**A130341700000**	**67,09**
17,25	228	130	2	**A130341725000**	**88,80**
17,5	228	130	2	**A130341750000**	**75,10**
17,75	228	130	2	**A130341775000**	**88,80**
18	228	130	2	**A130341800000**	**70,79**
18,25	233	135	2	**A130341825000**	**97,66**
18,5	233	135	2	**A130341850000**	**80,78**
18,75	233	135	2	**A130341875000**	**97,66**
19	233	135	2	**A130341900000**	**81,60**
19,25	238	140	2	**A130341925000**	**106,33**
19,5	238	140	2	**A130341950000**	**89,46**
19,75	238	140	2	**A130341975000**	**106,33**
20	238	140	2	**A130342000000**	**89,84**
20,25	243	145	2	**A130342025000**	**109,98**
20,5	243	145	2	**A130342050000**	**93,12**
20,75	243	145	2	**A130342075000**	**109,98**
21	243	145	2	**A130342100000**	**93,12**
21,25	248	150	2	**A130342125000**	**121,36**
21,5	248	150	2	**A130342150000**	**102,71**
21,75	248	150	2	**A130342175000**	**121,36**
22	248	150	2	**A130342200000**	**103,22**
22,25	248	150	2	**A130342225000**	**132,79**
22,5	253	155	2	**A130342250000**	**113,42**
22,75	253	155	2	**A130342275000**	**132,79**
23	253	155	2	**A130342300000**	**115,23**
23,25	276	155	3	**A130342325000**	**146,49**
23,5	276	155	3	**A130342350000**	**123,82**
23,75	281	160	3	**A130342375000**	**146,57**

D	L	I	CM	Code	Price
mm.	mm.	mm.			€
24	281	160	3	**A130342400000**	**124,19**
24,25	281	160	3	**A130342425000**	**156,85**
24,5	281	160	3	**A130342450000**	**135,50**
24,75	281	160	3	**A130342475000**	**159,80**
25	281	160	3	**A130342500000**	**135,24**
25,25	286	165	3	**A130342525000**	**174,03**
25,5	286	165	3	**A130342550000**	**146,95**
25,75	286	165	3	**A130342575000**	**173,82**
26	286	165	3	**A130342600000**	**147,13**
26,25	286	165	3	**A130342625000**	**188,23**
26,5	286	165	3	**A130342650000**	**159,33**
26,75	291	170	3	**A130342675000**	**188,23**
27	291	170	3	**A130342700000**	**157,54**
27,25	291	170	3	**A130342725000**	**201,45**
27,5	291	170	3	**A130342750000**	**170,57**
27,75	291	170	3	**A130342775000**	**201,45**
28	291	170	3	**A130342800000**	**169,45**
28,25	296	175	3	**A130342825000**	**214,25**
28,5	296	175	3	**A130342850000**	**182,90**
28,75	296	175	3	**A130342875000**	**216,10**
29	296	175	3	**A130342900000**	**182,16**
29,25	296	175	3	**A130342925000**	**237,59**
29,5	296	175	3	**A130342950000**	**200,43**
29,75	296	175	3	**A130342975000**	**237,59**
30	296	175	3	**A130343000000**	**199,70**
30,25	301	180	3	**A130343025000**	**270,48**
30,5	301	180	3	**A130343050000**	**230,26**
30,75	301	180	3	**A130343075000**	**268,07**
31	301	180	3	**A130343100000**	**223,74**
31,25	301	180	3	**A130343125000**	**283,88**
31,5	301	180	3	**A130343150000**	**241,80**
31,75	306	185	3	**A130343175000**	**283,88**
32	334	185	4	**A130343200000**	**237,03**

Cutting conditions and recommended material

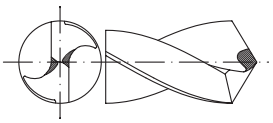
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill													
	From	To	Coolant	3	4	5	6	8	10	12,5	16	20	25	30	40	50	60	70
1	32	45	(A)	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400	0,450	0,500	0,630	0,800	1,000
2	25	40	(A)	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400	0,450	0,500	0,630	0,800	1,000
3	20	31,5	(A)	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800
4	16	25	(A)	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800
5	10	14	(A)	0,050	0,060	0,080	0,100	0,100	0,130	0,160	0,200	0,220	0,250	0,280	0,310	0,400	0,500	0,630
13.1	31,5	40	(C)	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
13.2	25	31,5	(A)	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
16	40	63	(A)	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
17	32	50	(A)	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400	0,450	0,500	0,630	0,800	1,000
19	25	40	(A)	0,080	0,100	0,130	0,160	0,180	0,200	0,250	0,310	0,350	0,400	0,450	0,500	0,630	0,800	1,000
20	16	30	(B)	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500	0,630	0,800
26	20	31,5	(D)	0,100	0,130	0,160	0,200	0,220	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800	1,000	1,250
30	3	6,25	(D)	MANUAL														

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

192.40
DIN 345

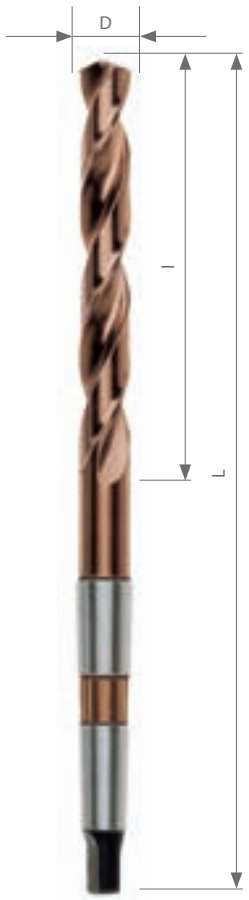
Classic series | Type NF
HSSCo 5 % | 5 x D



Standard series drills
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	130°
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated, golden-brown



Details and applications

The high strength at elevated temperatures of the cobalt high speed steel HSSCo and the design of the reinforced web in the whole length of the drill are the characteristics which give to this drill its capacity for use in working with materials which are hard, strong and difficult to machine. Use to drill: Steel and cast steel, alloyed and non alloyed over 900 N/mm^2 to 1200 N/mm^2-Some nickel-chrome steels-Ferritic and martensitic stainless steels-Acid resistant steels-Spring steels-Tough grey cast iron, malleable cast iron-Spheroidal cast iron.

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	168	87	1	**A192401000000**	**56,71**
10,5	168	87	1	**A192401050000**	**59,06**
11	175	94	1	**A192401100000**	**61,98**
11,5	175	94	1	**A192401150000**	**70,46**
12	182	101	1	**A192401200000**	**65,32**
12,5	182	101	1	**A192401250000**	**67,20**
13	182	101	1	**A192401300000**	**69,40**
13,5	189	108	1	**A192401350000**	**87,66**
14	189	108	1	**A192401400000**	**77,77**
14,5	212	114	2	**A192401450000**	**87,23**
15	212	114	2	**A192401500000**	**90,05**
15,5	218	120	2	**A192401550000**	**90,41**
16	218	120	2	**A192401600000**	**94,71**
16,5	223	125	2	**A192401650000**	**99,61**
17	223	125	2	**A192401700000**	**99,16**
17,5	228	130	2	**A192401750000**	**95,39**
18	228	130	2	**A192401800000**	**101,38**
18,5	233	135	2	**A192401850000**	**109,36**
19	233	135	2	**A192401900000**	**109,25**
19,5	238	140	2	**A192401950000**	**132,55**
20	238	140	2	**A192402000000**	**116,03**
20,5	238	140	2	**A192402050000**	**141,55**
21	243	145	2	**A192402100000**	**139,57**
21,5	243	145	2	**A192402150000**	**182,68**
22	248	150	2	**A192402200000**	**160,77**
22,5	248	150	2	**A192402250000**	**195,60**
23	253	155	2	**A192402300000**	**181,69**
23,5	253	155	2	**A192402350000**	**192,53**
24	281	160	3	**A192402400000**	**208,77**
24,5	281	160	3	**A192402450000**	**221,71**
25	281	160	3	**A192402500000**	**208,96**
25,5	281	160	3	**A192402550000**	**267,52**
26	286	165	3	**A192402600000**	**245,07**
26,5	286	165	3	**A192402650000**	**285,62**
27	291	170	3	**A192402700000**	**267,21**
27,5	291	170	3	**A192402750000**	**300,66**
28	291	170	3	**A192402800000**	**306,15**
28,5	291	170	3	**A192402850000**	**347,29**
29	296	175	3	**A192402900000**	**317,21**
29,5	296	175	3	**A192402950000**	**317,98**
30	296	175	3	**A192403000000**	**297,56**
32	334	185	4	**A192403200000**	**366,45**
34	339	190	4	**A192403400000**	**414,36**
36	344	195	4	**A192403600000**	**493,11**
38	349	200	4	**A192403800000**	**569,09**
40	349	200	4	**A192404000000**	**699,36**

Cutting conditions and recommended material

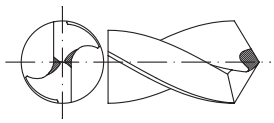
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill							
	From	To	Coolant	10	12,5	16	20	25	30	40	50
3	25	30	(A)	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500
4	15	20	(A)	0,160	0,200	0,250	0,280	0,310	0,350	0,400	0,500
5	10	16	(A)	0,100	0,130	0,160	0,180	0,200	0,220	0,250	0,310
6	14	14	(A)	0,130	0,160	0,200	0,220	0,250	0,280	0,310	0,400
7	8	12,5	(A) (B)	0,130	0,160	0,200	0,220	0,250	0,280	0,310	0,400
8	6,3	10		0,100	0,130	0,160	0,180	0,200	0,220	0,250	0,310
10	4	6,3		0,100	0,130	0,160	0,180	0,200	0,220	0,250	0,310
13.1	30	35		0,200	0,250	0,310	0,350	0,400	0,450	0,500	0,630
13.2	22	32	(B) (A)	0,250	0,310	0,400	0,450	0,500	0,560	0,630	0,800

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

136.30
DIN 341

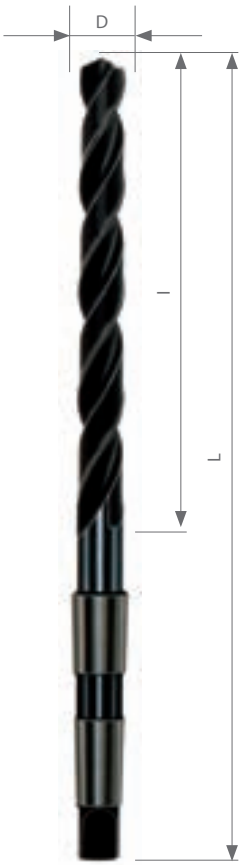
Classic series HSS | Type N 8 x D



Taper length drills
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118°
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated



Details and applications

This drill responds to the demand for long series drills for deep hole drilling in a wide range of applications and in work requiring the use of a guide bush. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 900 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
8	181	100	1	**A136300800000**	**25,35**
8,5	181	100	1	**A136300850000**	**25,35**
9	188	107	1	**A136300900000**	**28,53**
9,5	188	107	1	**A136300950000**	**32,20**
10	197	116	1	**A136301000000**	**31,64**
10,5	197	116	1	**A136301050000**	**33,16**
11	206	125	1	**A136301100000**	**31,64**
11,5	206	125	1	**A136301150000**	**31,64**
12	215	134	1	**A136301200000**	**34,00**
12,5	215	134	1	**A136301250000**	**35,11**
13	215	134	1	**A136301300000**	**35,11**
13,5	223	142	1	**A136301350000**	**38,14**
14	223	142	1	**A136301400000**	**39,52**
14,5	245	147	2	**A136301450000**	**50,03**
15	245	147	2	**A136301500000**	**49,27**
15,5	251	153	2	**A136301550000**	**51,96**
16	251	153	2	**A136301600000**	**50,65**
16,5	257	159	2	**A136301650000**	**54,38**
17	257	159	2	**A136301700000**	**54,38**
17,5	263	165	2	**A136301750000**	**62,74**
18	263	165	2	**A136301800000**	**61,22**
18,5	269	171	2	**A136301850000**	**68,69**
19	269	171	2	**A136301900000**	**64,61**
19,5	275	177	2	**A136301950000**	**74,89**
20	275	177	2	**A136302000000**	**68,69**
20,25	282	184	2	**A136302025000**	**97,77**
20,5	282	184	2	**A136302050000**	**88,30**
21	282	184	2	**A136302100000**	**78,77**
22	289	191	2	**A136302200000**	**89,82**
23	296	198	2	**A136302300000**	**89,82**
24	327	206	3	**A136302400000**	**115,81**
25	327	206	3	**A136302500000**	**115,81**
26	335	214	3	**A136302600000**	**122,09**
27	343	222	3	**A136302700000**	**131,49**
28	343	222	3	**A136302800000**	**149,72**
29	351	230	3	**A136302900000**	**157,33**
29,5	351	230	3	**A136302950000**	**196,92**
30	351	230	3	**A136303000000**	**163,76**

Cutting conditions and recommended material

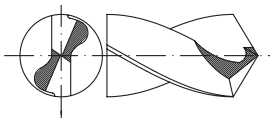
Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill								
	From	To	Coolant	8	10	12,5	16	20	25	30	40	50
1	20	32	(A)	0,126	0,144	0,180	0,225	0,252	0,279	0,315	0,360	0,450
2	16	25	(A)	0,126	0,144	0,180	0,225	0,252	0,279	0,315	0,360	0,450
3	12,75	20	(A)	0,090	0,117	0,144	0,180	0,198	0,225	0,252	0,279	0,360
4	10	16	(A)	0,090	0,117	0,144	0,180	0,198	0,225	0,252	0,279	0,360
13.1	20	28	(A) (B)	0,198	0,225	0,279	0,360	0,405	0,450	0,504	0,567	0,720
13.2	16	20	(A)	0,198	0,225	0,279	0,360	0,405	0,450	0,504	0,567	0,720
26	12,75	20	(D)	0,126	0,144	0,180	0,225	0,252	0,279	0,315	0,360	0,450

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

138.30
DIN 341

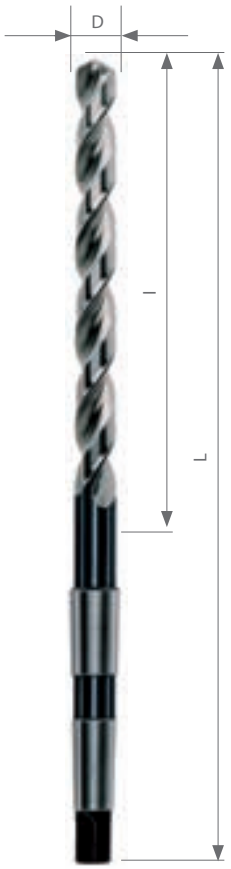
Classic series HSS | Type NV 8 x D



Taper length drills. Worm pattern
Taper shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130°
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land, bright finish flutes



Details and applications

This robust drill (with reinforced web and wide flutes) is specially appropriate for drilling deep holes in difficult conditions, where chip removal and lubrication of the edge make working difficult and preferably in work requiring the use of a guide bush. Use to drill: Steel and cast steel, alloyed and non alloyed, up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite- Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings-Not recommended for nickel-chrome steels or similar materials).

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	197	116	1	**A138301000000**	**44,63**
11	206	125	1	**A138301100000**	**49,40**
12	215	134	1	**A138301200000**	**56,10**
13	215	134	1	**A138301300000**	**60,38**
14	223	142	1	**A138301400000**	**61,08**
14,25	245	147	2	**A138301425000**	**80,07**
14,5	245	147	2	**A138301450000**	**69,79**
14,75	245	147	2	**A138301475000**	**80,84**
15	245	147	2	**A138301500000**	**69,79**
15,25	251	153	2	**A138301525000**	**84,92**
15,5	251	153	2	**A138301550000**	**73,73**
15,75	251	153	2	**A138301575000**	**84,92**
16	251	153	2	**A138301600000**	**72,97**
16,25	257	159	2	**A138301625000**	**96,81**
16,5	257	159	2	**A138301650000**	**91,14**
16,75	257	159	2	**A138301675000**	**99,15**
17	257	159	2	**A138301700000**	**91,14**
17,25	263	165	2	**A138301725000**	**101,50**
17,5	263	165	2	**A138301750000**	**93,48**
17,75	263	165	2	**A138301775000**	**101,50**
18	263	165	2	**A138301800000**	**91,14**
18,25	269	171	2	**A138301825000**	**101,50**
18,5	269	171	2	**A138301850000**	**95,84**
18,75	269	171	2	**A138301875000**	**110,96**
19	269	171	2	**A138301900000**	**95,84**
19,25	275	177	2	**A138301925000**	**115,74**
19,5	275	177	2	**A138301950000**	**107,79**
19,75	275	177	2	**A138301975000**	**117,32**
20	275	177	2	**A138302000000**	**103,01**
20,5	282	184	2	**A138302050000**	**130,03**
21	282	184	2	**A138302100000**	**121,33**
21,5	289	191	2	**A138302150000**	**143,44**
22	289	191	2	**A138302200000**	**135,50**
22,5	296	198	2	**A138302250000**	**156,91**
23	296	198	2	**A138302300000**	**143,44**
23,5	319	198	3	**A138302350000**	**175,98**
24	327	206	3	**A138302400000**	**171,22**
24,5	327	206	3	**A138302450000**	**189,53**
25	327	206	3	**A138302500000**	**177,64**
25,5	335	214	3	**A138302550000**	**194,30**
26	335	214	3	**A138302600000**	**176,81**
26,5	335	214	3	**A138302650000**	**201,42**
27	343	222	3	**A138302700000**	**187,11**
27,5	343	222	3	**A138302750000**	**215,64**
28	343	222	3	**A138302800000**	**202,18**
28,5	351	230	3	**A138302850000**	**223,59**
29	351	230	3	**A138302900000**	**215,64**
29,5	351	230	3	**A138302950000**	**240,17**
30	360	239	3	**A138303000000**	**232,45**

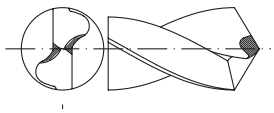
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill						
	From	To	Coolant	10	12,5	16	20	25	30	40
1	25	40	(A)	0,160	0,200	0,250	0,280	0,310	0,350	0,400
2	20	31,5	(A)	0,160	0,200	0,250	0,280	0,310	0,350	0,400
3	16	25	(A)	0,130	0,160	0,200	0,220	0,250	0,280	0,310
4	12,5	20	(A)	0,130	0,160	0,200	0,220	0,250	0,280	0,310
5	8	12,5	(B)	0,080	0,100	0,120	0,140	0,160	0,180	0,200
13.1	25	35	(C)	0,250	0,310	0,400	0,450	0,500	0,560	0,630
13.2	20	25	(A)	0,250	0,310	0,400	0,450	0,500	0,560	0,630
23	63	100	(A)	0,200	0,250	0,310	0,350	0,400	0,450	0,500
25	25	40	(A)	0,160	0,200	0,250	0,280	0,310	0,350	0,400

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

250.30
DIN 341/346

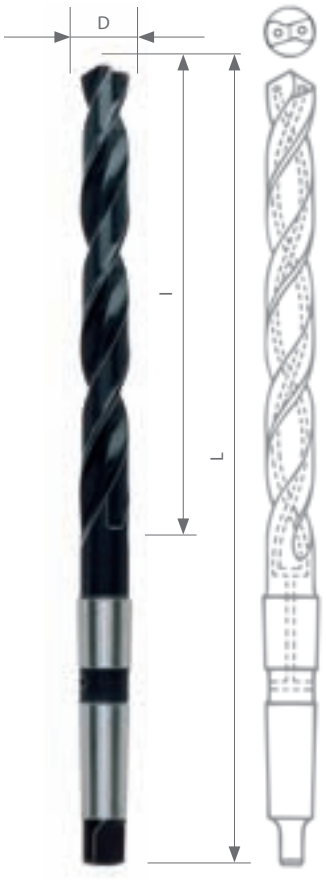


Classic series HSS | Type NV 8 x D

Taper length drills with internal cooling.
Taper shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Much heavier than normal
Web taper	Light
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated



Details and applications

Oil hole drills carry interior ducts following the line of the helix and run the whole length of the drill. The coolant flows, under pressure, right to the point to lubricate and cool the cutting edges, thus reducing wear and assisting in the removal of swarf. These drills are especially recommended for deep hole drilling and when the amterial being machined demands good cooling and(or lubrication. Use to drill: Multiple layers of metal sheets, alloyed and non alloyed materials, malleable castings, Nodular and pressure casting-sintered iron, etc..

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
12	232	134	2	**A250301200000**	**212,33**
13	232	134	2	**A250301300000**	**198,13**
14	240	142	2	**A250301400000**	**212,33**
15	245	147	2	**A250301500000**	**218,10**
16	251	153	2	**A250301600000**	**229,68**
17	257	159	2	**A250301700000**	**229,68**
18	263	165	2	**A250301800000**	**245,31**
19	292	171	3	**A250301900000**	**249,66**
20	298	177	3	**A250302000000**	**267,47**
21	305	184	3	**A250302100000**	**282,36**
22	312	191	3	**A250302200000**	**295,06**
23	319	198	3	**A250302300000**	**297,45**
24	327	206	3	**A250302400000**	**282,36**
25	327	206	3	**A250302500000**	**295,66**
26	335	214	3	**A250302600000**	**321,49**
27	371	222	4	**A250302700000**	**329,99**
28	371	222	4	**A250302800000**	**366,04**
29	379	230	4	**A250302900000**	**387,46**
30	379	230	4	**A250303000000**	**416,16**

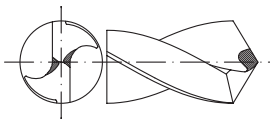
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill					
	From	To	Coolant	10	12,5	16	20	25	30
1	50	60	(A) (B)	0,200	0,250	0,310	0,350	0,400	0,450
2	40	50	(A) (B)	0,200	0,250	0,310	0,350	0,400	0,450
3	25	35	(A) (B)	0,160	0,200	0,250	0,280	0,310	0,350
4	25	35	(A) (B)	0,160	0,200	0,250	0,280	0,310	0,350
5	16	25	(A) (B)	0,160	0,200	0,250	0,280	0,310	0,350
6	14	14	(A) (B)	0,130	0,160	0,200	0,220	0,250	0,280
7	12	12	(A) (B)	0,080	0,100	0,120	0,140	0,160	0,180
8	10	10	(A) (B)	0,080	0,100	0,120	0,140	0,160	0,180
13.1	45	56	(A) (B)	0,250	0,310	0,400	0,450	0,500	0,560

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

141.30
DIN 1870/1

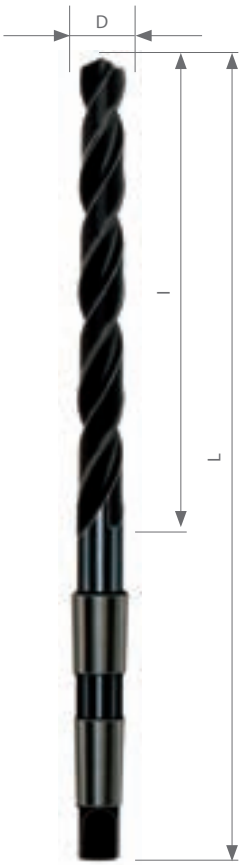


Classic series | Type N
HSS | 10 x D

Extra length drills. Series 1
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Light
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated



Details and applications

Drill specially recommended to drill extremely deep holes. Its use requires a thorough study in order to determine workholding methods, feeds and speeds. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant. These drills are not recommended for drilling oil holes in crankshafts. Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 700 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf-Electrolytic cooper-Zinc castings.

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	285	185	1	**A141301000000**	**68,12**
11	300	195	1	**A141301100000**	**77,19**
12	310	205	1	**A141301200000**	**78,91**
13	310	205	1	**A141301300000**	**78,77**
14	325	220	1	**A141301400000**	**86,86**
14,5	340	220	2	**A141301450000**	**95,69**
15	340	220	2	**A141301500000**	**102,40**
15,5	355	230	2	**A141301550000**	**109,79**
16	355	230	2	**A141301600000**	**106,47**
16,5	355	230	2	**A141301650000**	**107,18**
17	355	230	2	**A141301700000**	**119,54**
17,5	370	245	2	**A141301750000**	**130,66**
18	370	245	2	**A141301800000**	**129,00**
18,5	370	245	2	**A141301850000**	**130,25**
19	370	245	2	**A141301900000**	**130,25**
19,5	385	260	2	**A141301950000**	**145,17**
20	385	260	2	**A141302000000**	**141,78**
20,5	385	260	2	**A141302050000**	**192,98**
21	385	260	2	**A141302100000**	**177,29**
22	405	270	2	**A141302200000**	**189,32**
23	405	270	2	**A141302300000**	**215,92**
24	440	290	3	**A141302400000**	**237,00**
25	440	290	3	**A141302500000**	**251,44**
26	440	290	3	**A141302600000**	**272,79**
27	460	305	3	**A141302700000**	**283,36**
28	460	305	3	**A141302800000**	**304,64**
29	460	305	3	**A141302900000**	**323,98**
30	460	305	3	**A141303000000**	**332,90**
32	505	320	4	**A141303200000**	**421,34**
35	530	340	4	**A141303500000**	**478,07**
38	555	340	4	**A141303800000**	**548,88**
40	555	360	4	**A141304000000**	**583,85**
42	555	360	4	**A141304200000**	**646,17**
45	585	385	4	**A141304500000**	**734,68**

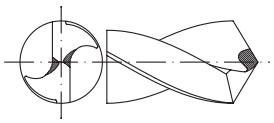
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill							
	From	To	Coolant	10	12,5	16	20	25	30	40	50
1	17,5	28	(A)	0,128	0,160	0,200	0,224	0,248	0,280	0,320	0,400
2	14	22	(A)	0,128	0,160	0,200	0,224	0,248	0,280	0,320	0,400
3	11	17,5	(A)	0,104	0,128	0,160	0,176	0,200	0,224	0,248	0,320
4	8,75	14	(A)	0,104	0,128	0,160	0,176	0,200	0,224	0,248	0,320
13.1	17,5	24,5	(A) (B)	0,200	0,248	0,320	0,360	0,400	0,448	0,504	0,640
13.2	14	17,5	(A)	0,200	0,248	0,320	0,360	0,400	0,448	0,504	0,640

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

142.30
DIN 1870/2

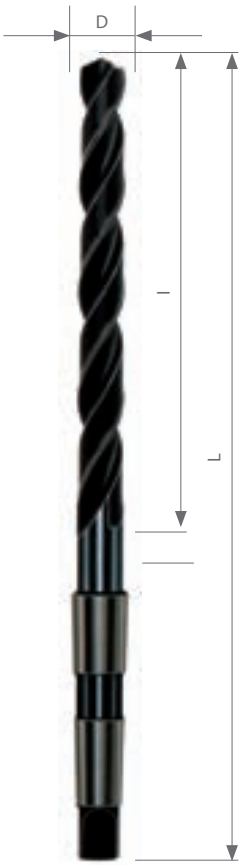


Classic series HSS | Type N 15 x D

Extra length drills. Series 2
Taper shank drills

Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Light
Flute form	Normal
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated



Details and applications

Drill specially recommended to drill extremely deep holes. Its use requires a thorough study in order to determine workholding methods, feeds and speeds. It is of vital importance to remove the drill frequently from the hole and to have a good supply of the correct coolant (these drills are not recommended for drilling oil holes in crankshafts). Use to drill: Steel and cast steel, alloyed and non-alloyed steel, up to up to 700 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings.

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	360	235	1	**A142301000000**	**99,36**
11	375	250	1	**A142301100000**	**103,65**
12	395	260	1	**A142301200000**	**115,19**
13	395	260	1	**A142301300000**	**116,22**
14	410	275	1	**A142301400000**	**129,96**
14,5	425	275	2	**A142301450000**	**135,44**
15	425	275	2	**A142301500000**	**139,09**
15,5	445	295	2	**A142301550000**	**142,55**
16	445	295	2	**A142301600000**	**142,55**
16,5	445	295	2	**A142301650000**	**153,25**
17	445	295	2	**A142301700000**	**152,35**
17,5	465	310	2	**A142301750000**	**165,69**
18	465	310	2	**A142301800000**	**166,86**
18,5	465	310	2	**A142301850000**	**180,75**
19	465	310	2	**A142301900000**	**182,48**
19,5	490	325	2	**A142301950000**	**201,97**
20	490	325	2	**A142302000000**	**196,37**
20,5	490	325	2	**A142302050000**	**226,77**
21	490	325	2	**A142302100000**	**219,72**
22	515	345	2	**A142302200000**	**259,67**
23	515	345	2	**A142302300000**	**267,39**
24	555	365	3	**A142302400000**	**301,05**
25	555	365	3	**A142302500000**	**308,03**
26	555	365	3	**A142302600000**	**364,62**
27	580	385	3	**A142302700000**	**387,97**
28	580	385	3	**A142302800000**	**410,78**
29	580	385	3	**A142302900000**	**433,92**
30	580	385	3	**A142303000000**	**451,47**
32	635	410	4	**A142303200000**	**539,77**
35	665	430	4	**A142303500000**	**601,89**
38	695	430	4	**A142303800000**	**717,00**
40	695	460	4	**A142304000000**	**752,38**
42	695	460	4	**A142304200000**	**840,20**
45	735	490	4	**A142304500000**	**969,75**

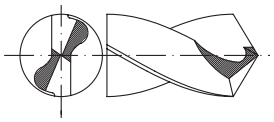
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill							
	From	To	Coolant	10	12,5	16	20	25	30	40	50
1	17,5	28	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280	0,350
2	14	22	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280	0,350
3	11	17,5	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217	0,280
4	8,75	14	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217	0,280
13.1	17,5	24,5	(A) (B)	0,175	0,217	0,280	0,315	0,350	0,392	0,441	0,560
13.2	14	17,5	(A)	0,175	0,217	0,280	0,315	0,350	0,392	0,441	0,560

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

143.30
DIN 1870/1



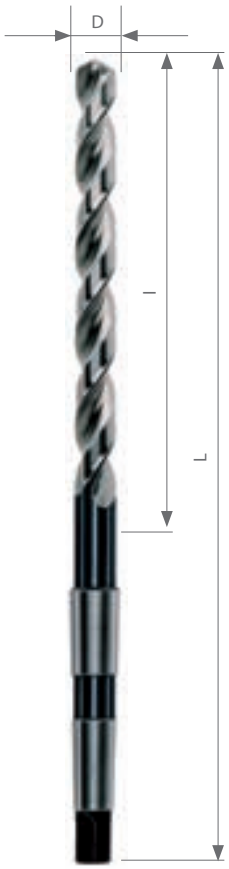
Classic series HSS | Type NV 10 x D

Extra length drills. Worm pattern. Series 1

Taper shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

A robust drill (reinforced web) with wide flutes. Thanks to its length, its geometry guarantees the drilling of extremely deep holes, where chip removal and lubrication of the edge make working difficult. Use to drill: Steel and cast steel, alloyed and non alloyed, up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings- Not recommended for nickel-chrome steels or similar materials).

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	285	185	1	**A143301000000**	**66,26**
11	300	195	1	**A143301100000**	**89,69**
12	310	205	1	**A143301200000**	**80,57**
13	310	205	1	**A143301300000**	**84,01**
14	325	220	1	**A143301400000**	**89,96**
14,5	340	220	2	**A143301450000**	**99,36**
15	340	220	2	**A143301500000**	**106,47**
15,5	355	230	2	**A143301550000**	**117,05**
16	355	230	2	**A143301600000**	**110,55**
16,5	355	230	2	**A143301650000**	**112,36**
17	355	230	2	**A143301700000**	**114,14**
17,5	370	245	2	**A143301750000**	**122,23**
18	370	245	2	**A143301800000**	**126,78**
18,5	370	245	2	**A143301850000**	**139,03**
19	370	245	2	**A143301900000**	**136,67**
19,5	385	260	2	**A143301950000**	**153,74**
20	385	260	2	**A143302000000**	**144,54**
20,5	385	260	2	**A143302050000**	**193,25**
21	385	260	2	**A143302100000**	**174,12**
22	405	270	2	**A143302200000**	**226,29**
23	405	270	3	**A143302300000**	**226,29**
24	440	290	3	**A143302400000**	**239,90**
25	440	290	3	**A143302500000**	**249,85**
26	440	290	3	**A143302600000**	**279,28**
27	460	305	3	**A143302700000**	**293,17**
28	460	305	3	**A143302800000**	**309,34**
29	460	305	3	**A143302900000**	**335,81**
30	460	305	3	**A143303000000**	**344,72**

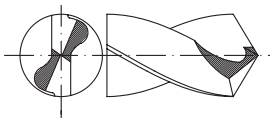
Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill						
	From	To	Coolant	10	12,5	16	20	25	30	40
1	17,5	28	(A)	0,128	0,160	0,200	0,224	0,248	0,280	0,320
2	14	22	(A)	0,128	0,160	0,200	0,224	0,248	0,280	0,320
3	11	17,5	(A)	0,104	0,128	0,160	0,176	0,200	0,224	0,248
4	8,75	14	(A)	0,104	0,128	0,160	0,176	0,200	0,224	0,248
5	5,5	8,75	(B)	0,064	0,080	0,096	0,112	0,128	0,144	0,160
13.1	17,5	24,5	(C)	0,200	0,248	0,320	0,360	0,400	0,448	0,504
13.2	14	17,5	(A)	0,200	0,248	0,320	0,360	0,400	0,448	0,504
23	44	70	(A)	0,160	0,200	0,248	0,280	0,320	0,360	0,400
25	17,5	28	(A)	0,128	0,160	0,200	0,224	0,248	0,280	0,320

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

144.30
DIN 1870/2



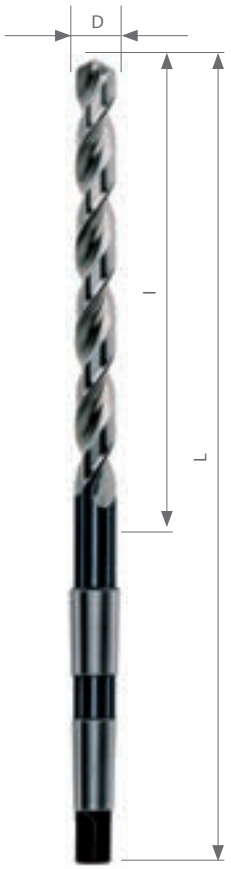
Classic series HSS | Type NV 15 x D

Extra length drills. Worm pattern. Series 2

Taper shank drills

Design and technical specifications

Helix angle	Bigger than Standard
Point angle	130º
Point grinding	Relieved cone and web thinned according to DIN 1412-C ("Split point")
Web thickness	Much heavier than normal
Web taper	None
Flute form	Very wide with special rounded-off heel
Tolerance D	h8
Other specifications	DIN 1414
Finish	Surface treated land., bright finish flutes



Details and applications

A robust drill (reinforced web) with wide flutes. Thanks to its length, its geometry guarantees the drilling of extremely deep holes, where chip removal and lubrication of the edge make working difficult. Use to drill: Steel and cast steel, alloyed and non alloyed, up to 1000 N/mm^2- Grey iron castings- Malleable cast iron- Spheroidal cast iron- Pressure castings- Sintered iron- German silver- Graphite-Phosphor bronze for bearings- Bronze alloys of aluminium, lead, manganese or silicon-Soft brass (≥60% Cu). continuous swarf- Electrolytic cooper-Zinc castings- Not recommended for nickel-chrome steels or similar materials).

D	L	l	CM	Code	Price
mm.	mm.	mm.			€
10	360	235	1	**A144301000000**	**100,47**
11	375	250	1	**A144301100000**	**106,33**
12	395	260	1	**A144301200000**	**127,21**
13	395	260	1	**A144301300000**	**129,35**
14	410	275	1	**A144301400000**	**134,74**
14,5	425	275	1	**A144301450000**	**137,5**
15	425	275	2	**A144301500000**	**145,93**
15,5	445	295	2	**A144301550000**	**152,08**
16	445	295	2	**A144301600000**	**148,14**
16,5	445	295	2	**A144301650000**	**169,21**
17	445	295	2	**A144301700000**	**156,77**
17,5	465	310	2	**A144301750000**	**170,47**
18	465	310	2	**A144301800000**	**176,47**
18,5	465	310	2	**A144301850000**	**189,47**
19	465	310	2	**A144301900000**	**196,23**
19,5	490	325	2	**A144301950000**	**212,11**
20	490	325	2	**A144302000000**	**215,02**
20,5	490	325	2	**A144302050000**	**219,59**
21	490	325	2	**A144302100000**	**231,40**
22	515	345	2	**A144302200000**	**272,66**
23	515	345	3	**A144302300000**	**281,98**
24	555	365	3	**A144302400000**	**314,60**
25	555	365	3	**A144302500000**	**326,28**
26	555	365	3	**A144302600000**	**385,84**
27	580	385	3	**A144302700000**	**407,25**
28	580	385	3	**A144302800000**	**433,84**
29	580	385	3	**A144302900000**	**455,20**
30	580	385	3	**A144303000000**	**493,82**

Cutting conditions and recommended material

Material group number	Cutting speed m/min			Feed (mm/rev) based on diameter of the drill						
	From	To	Coolant	10	12,5	16	20	25	30	40
1	17,5	28	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280
2	14	22	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280
3	11	17,5	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217
4	8,75	14	(A)	0,091	0,112	0,140	0,154	0,175	0,196	0,217
5	5,5	8,75	(B)	0,056	0,070	0,084	0,098	0,112	0,126	0,140
13.1	17,5	24,5	(C)	0,175	0,217	0,280	0,315	0,350	0,392	0,441
13.2	14	17,5	(A)	0,175	0,217	0,280	0,315	0,350	0,392	0,441
23	44	70	(A)	0,140	0,175	0,217	0,245	0,280	0,315	0,350
25	17,5	28	(A)	0,112	0,140	0,175	0,196	0,217	0,245	0,280

Coolant: (A) Soluble oil / (B) Cutting oil / (C) Dry / (D) Compressed air / (E) Water

r.p.m. = Vc x 1000/ (π x D)

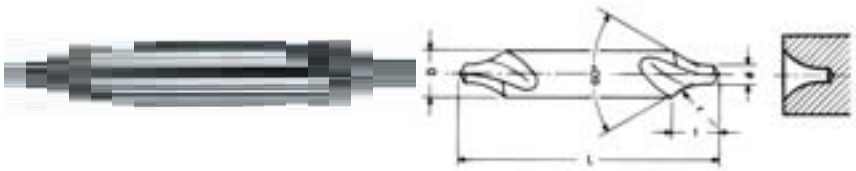
150.3B
DIN 333

Classic series | Type N
HSS

Radius form 60° R
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	Precise concentricity between point and body, high resistance to breakage. The radiused form provides a protected centre-hole.
Finish	No surface treatment, bright finish



Details and applications

The characteristics mentioned for this centre drill make it much better than the normal centre drill (without protected centre) . This radius centre drill is used for the manufacturing of 60° centre-holes, according to DIN 332, page 1, form R.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	2,12	**A1503B0050000**	**7,66**
0,8	3,15	20	2,65	**A1503B0080000**	**7,53**
1,0	3,15	31,5	3	**A1503B0100000**	**6,60**
1,25	3,15	31,5	3,35	**A1503B0125000**	**6,60**
1,6	4	35,5	4,25	**A1503B0160000**	**6,14**
2,0	5	40	5,3	**A1503B0200000**	**6,80**
2,5	6,3	45	6,7	**A1503B0250000**	**7,40**
3,15	8	50	8,5	**A1503B0315000**	**8,78**
4,0	10	56	10,6	**A1503B0400000**	**11,95**
5,0	12,5	63	13,2	**A1503B0500000**	**16,77**
6,3	16	71	17	**A1503B0630000**	**26,94**

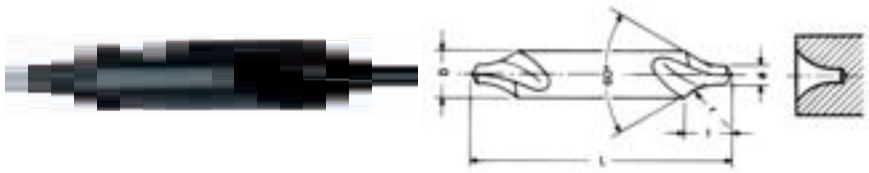
150.3N
DIN 333

Classic series | Type N
HSS

Radius form 60° R
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	Precise concentricity between point and body, high resistance to breakage. The radiused form provides a protected centre-hole.
Finish	Surface treated



Details and applications

The characteristics mentioned for this centre drill make it much better than the normal centre drill (without protected centre) . This radius centre drill is used for the manufacturing of 60° centre-holes, according to DIN 332, page 1, form R.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	2,12	**A1503N0050000**	**7,66**
0,8	3,15	20	2,65	**A1503N0080000**	**7,53**
1,0	3,15	31,5	3	**A1503N0100000**	**6,60**
1,25	3,15	31,5	3,35	**A1503N0125000**	**6,60**
1,6	4	35,5	4,25	**A1503N0160000**	**6,14**
2,0	5	40	5,3	**A1503N0200000**	**6,80**
2,5	6,3	45	6,7	**A1503N0250000**	**7,40**
3,15	8	50	8,5	**A1503N0315000**	**8,78**
4,0	10	56	10,6	**A1503N0400000**	**11,95**
5,0	12,5	63	13,2	**A1503N0500000**	**16,77**
6,3	16	71	17	**A1503N0630000**	**26,94**

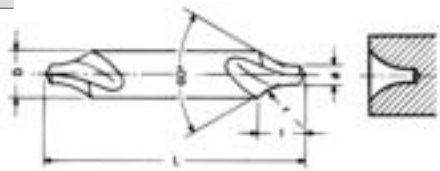
150.34
DIN 333

Classic series HSS | Type N | TiN

Radius form 60º R
Centre drills

Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	Precise concentricity between point and body, high resistance to breakage. The radiused form provides a protected centre-hole.
Finish	Coated
Coating	TiN



Details and applications

The characteristics mentioned for this centre drill make it much better than the normal centre drill (without protected centre) . This radius centre drill is used for the manufacturing of 60º centre-holes, according to DIN 332, page 1, form R.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	2,12	**A150340050000**	**21,82**
0,8	3,15	20	2,65	**A150340080000**	**21,38**
1,0	3,15	31,5	3	**A150340100000**	**18,49**
1,25	3,15	31,5	3,35	**A150340125000**	**18,49**
1,6	4	35,5	4,25	**A150340160000**	**17,34**
2,0	5	40	5,3	**A150340200000**	**18,94**
2,5	6,3	45	6,7	**A150340250000**	**20,80**
3,15	8	50	8,5	**A150340315000**	**24,53**
4,0	10	56	10,6	**A150340400000**	**33,63**
5,0	12,5	63	13,2	**A150340500000**	**47,51**
6,3	16	71	17	**A150340630000**	**75,89**

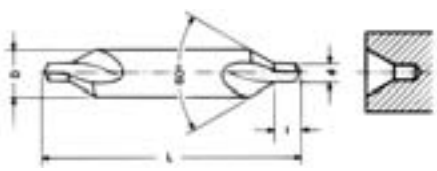
151.3B
DIN 333

Classic series HSS | Type N

60º Form A
Centre drills

Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	No surface treatment, bright finish



Details and applications

This centre drill (DIN 333 Form A) is recommended for the production of 60º centre holes according to DIN 332, sheet 1, form A. It can also be used for the production of centre holes according to DIN332, page 1,form C, in which the interior part to be centred is equal in forms A, B and C.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	0,8	**A1513B0050000**	**7,53**
0,8	3,15	20	1,1	**A1513B0080000**	**7,40**
1,0	3,15	31,5	1,3	**A1513B0100000**	**6,60**
1,25	3,15	31,5	1,6	**A1513B0125000**	**6,60**
1,6	4	35,5	2	**A1513B0160000**	**6,14**
2,0	5	40	2,5	**A1513B0200000**	**6,80**
2,5	6,3	45	3,1	**A1513B0250000**	**7,40**
3,15	8	50	3,9	**A1513B0315000**	**8,78**
4,0	10	56	5	**A1513B0400000**	**11,95**
5,0	12,5	63	6,3	**A1513B0500000**	**16,77**
6,3	16	71	8	**A1513B0630000**	**26,94**
8,0	20	80	10,1	**A1513B0800000**	**47,48**

151.3N
DIN 333

Classic series | Type N
HSS

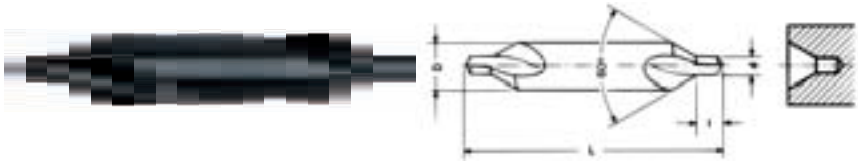
60° Form A
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Surface treated

Details and applications

This centre drill (DIN 333 Form A) is recommended for the production of 60° centre holes according to DIN 332, sheet 1, form A. It can also be used for the production of centre holes according to DIN332, page 1,form C, in which the interior part to be centred is equal in forms A, B and C.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	0,8	**A1513N0050000**	**7,53**
0,8	3,15	20	1,1	**A1513N0080000**	**7,40**
1,0	3,15	31,5	1,3	**A1513N0100000**	**6,60**
1,25	3,15	31,5	1,6	**A1513N0125000**	**6,60**
1,6	4	35,5	2	**A1513N0160000**	**6,14**
2,0	5	40	2,5	**A1513N0200000**	**6,80**
2,5	6,3	45	3,1	**A1513N0250000**	**7,40**
3,15	8	50	3,9	**A1513N0315000**	**8,78**
4,0	10	56	5	**A1513N0400000**	**11,95**
5,0	12,5	63	6,3	**A1513N0500000**	**16,77**
6,3	16	71	8	**A1513N0630000**	**26,94**
8,0	20	80	10,1	**A1513N0800000**	**47,48**

151.34
DIN 333

Classic series | Type N | TiN
HSS

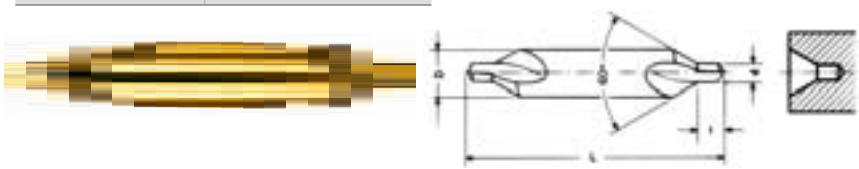
60° Form A
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Coated
Coating	TiN

Details and applications

This centre drill (DIN 333 Form A) is recommended for the production of 60° centre holes according to DIN 332, sheet 1, form A. It can also be used for the production of centre holes according to DIN332, page 1,form C, in which the interior part to be centred is equal in forms A, B and C.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	0,8	**A151340050000**	**21,38**
0,8	3,15	20	1,1	**A151340080000**	**20,80**
1,0	3,15	31,5	1,3	**A151340100000**	**18,49**
1,25	3,15	31,5	1,6	**A151340125000**	**18,49**
1,6	4	35,5	2	**A151340160000**	**17,34**
2,0	5	40	2,5	**A151340200000**	**18,94**
2,5	6,3	45	3,1	**A151340250000**	**20,80**
3,15	8	50	3,9	**A151340315000**	**24,53**
4,0	10	56	5	**A151340400000**	**33,63**
5,0	12,5	63	6,3	**A151340500000**	**47,51**
6,3	16	71	8	**A151340630000**	**75,89**
8,0	20	80	10,1	**A151340800000**	**134,06**

152.3B
DIN 333

Classic series | Type N
HSS

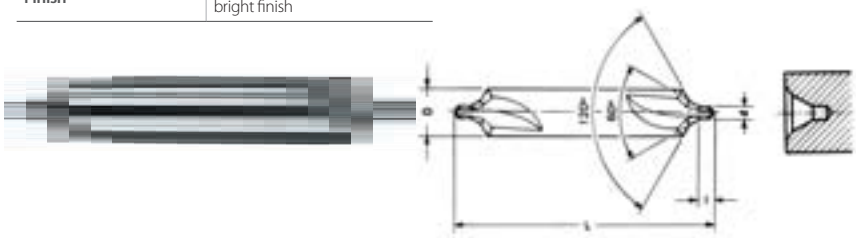
60/120° Form B
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	No surface treatment, bright finish

Details and applications

This centre drill (DIN333 Form B) with protective chamfer of 120° is used for the production of centre holes according to DIN 332, form A. It can also be used for the production of centre holes according to DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	4	35,5	1,3	**A1523B0100000**	**10,84**
1,25	5	40	1,6	**A1523B0125000**	**11,09**
1,6	6,3	45	2	**A1523B0160000**	**11,29**
2,0	8	50	2,5	**A1523B0200000**	**12,61**
2,5	10	56	3,1	**A1523B0250000**	**13,28**
3,15	11,2	60	3,9	**A1523B0315000**	**16,05**
4,0	14	67	5	**A1523B0400000**	**22,39**
5,0	18	75	6,3	**A1523B0500000**	**33,48**
6,3	20	80	8	**A1523B0630000**	**48,80**

152.3N
DIN 333

Classic series | Type N
HSS

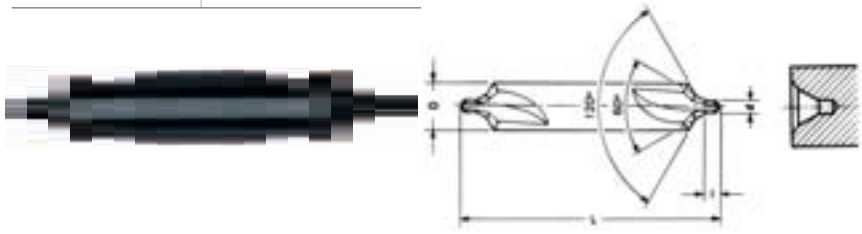
60/120° Form B
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Surface treated

Details and applications

This centre drill (DIN333 Form B) with protective chamfer of 120° is used for the production of centre holes according to DIN 332, form A. It can also be used for the production of centre holes according to DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	4	35,5	1,3	**A1523N0100000**	**10,84**
1,25	5	40	1,6	**A1523N0125000**	**11,09**
1,6	6,3	45	2	**A1523N0160000**	**11,29**
2,0	8	50	2,5	**A1523N0200000**	**12,61**
2,5	10	56	3,1	**A1523N0250000**	**13,28**
3,15	11,2	60	3,9	**A1523N0315000**	**16,05**
4,0	14	67	5	**A1523N0400000**	**22,39**
5,0	18	75	6,3	**A1523N0500000**	**33,48**
6,3	20	80	8	**A1523N0630000**	**48,80**

152.34
DIN 333

Classic series HSS | Type N | TiN

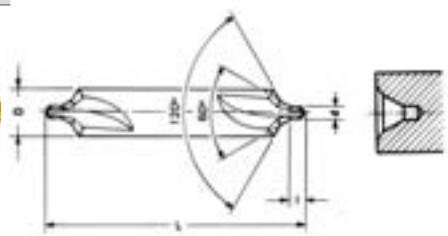
60/120° Form B
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Coated
Coating	TiN

Details and applications

This centre drill (DIN333 Form B) with protective chamfer of 120° is used for the production of centre holes according to DIN 332, form A. It can also be used for the production of centre holes according to DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	4	35,5	1,3	**A152340100000**	**30,30**
1,25	5	40	1,6	**A152340125000**	**31,20**
1,6	6,3	45	2	**A152340160000**	**31,79**
2,0	8	50	2,5	**A152340200000**	**35,44**
2,5	10	56	3,1	**A152340250000**	**37,50**
3,15	11,2	60	3,9	**A152340315000**	**45,33**
4,0	14	67	5	**A152340400000**	**63,04**
5,0	18	75	6,3	**A152340500000**	**94,45**
6,3	20	80	8	**A152340630000**	**137,52**

153.3B
DIN 333

Classic series HSS | Type N

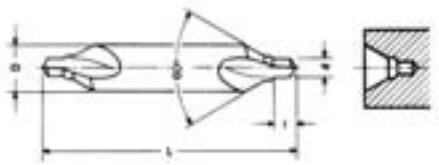
60° Form AR
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	No surface treatment, bright finish

Details and applications

This special centre-drill is suitable for the production of 60° centre-holes, according to DIN 322, page 1, form AR, without protective chamfer. It is recommended for those cases where the pieces turn at high-speed and the centre drill remains fixed.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	3,15	31,5	1,3	**A1533B0100000**	**6,60**
1,25	3,15	31,5	1,6	**A1533B0125000**	**6,60**
1,6	4	35,5	2	**A1533B0160000**	**6,14**
2,0	5	40	2,5	**A1533B0200000**	**6,80**
2,5	6,3	45	3,1	**A1533B0250000**	**7,40**
3,15	8	50	3,9	**A1533B0315000**	**8,78**
4,0	10	56	5	**A1533B0400000**	**11,95**
5,0	12,5	63	6,3	**A1533B0500000**	**16,77**
6,3	16	71	8	**A1533B0630000**	**26,94**

153.3N
DIN 333

Classic series HSS | Type N

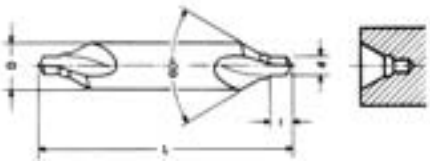
60° Form AR
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Surface treated

Details and applications

This special centre-drill is suitable for the production of 60° centre-holes, according to DIN 322, page 1, form AR, without protective chamfer. It is recommended for those cases where the pieces turn at high-speed and the centre drill remains fixed.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	3,15	31,5	1,3	**A1533N0100000**	**6,60**
1,25	3,15	31,5	1,6	**A1533N0125000**	**6,60**
1,6	4	35,5	2	**A1533N0160000**	**6,14**
2,0	5	40	2,5	**A1533N0200000**	**6,80**
2,5	6,3	45	3,1	**A1533N0250000**	**7,40**
3,15	8	50	3,9	**A1533N0315000**	**8,78**
4,0	10	56	5	**A1533N0400000**	**11,95**
5,0	12,5	63	6,3	**A1533N0500000**	**16,77**
6,3	16	71	8	**A1533N0630000**	**26,94**

153.34
DIN 333

Classic series HSS | Type N | TiN

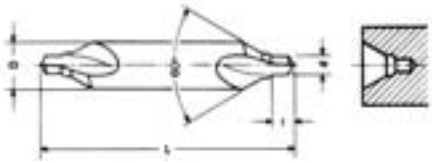
60° Form AR
Centre drills

Design and technical specifications

Point angle	118°
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Coated
Coating	TiN

Details and applications

This special centre-drill is suitable for the production of 60° centre-holes, according to DIN 322, page 1, form AR, without protective chamfer. It is recommended for those cases where the pieces turn at high-speed and the centre drill remains fixed.



d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
1,0	3,15	31,5	1,3	**A153340100000**	**18,49**
1,25	3,15	31,5	1,6	**A153340125000**	**18,49**
1,6	4	35,5	2	**A153340160000**	**17,34**
2,0	5	40	2,5	**A153340200000**	**18,94**
2,5	6,3	45	3,1	**A153340250000**	**20,80**
3,15	8	50	3,9	**A153340315000**	**24,53**
4,0	10	56	5	**A153340400000**	**33,63**
5,0	12,5	63	6,3	**A153340500000**	**47,51**
6,3	16	71	8	**A153340630000**	**75,89**

156.3B
DIN 333

Classic series | Type N
HSS
Radiales 60º Form A Izquierdas
Centre drills

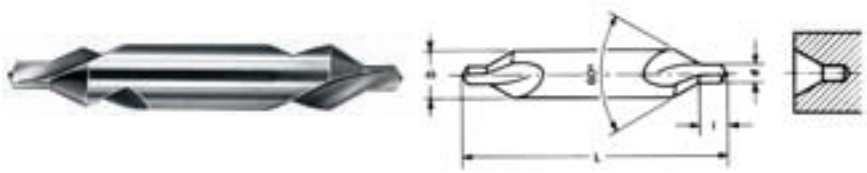
Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	No surface treatment, bright finish

Details and applications

This centre drill (DIN 333 Form A) is suitable for the production of 60º centre holes according to DIN 332, page 1, form A. It can also be used for the production of centre holes DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,8	3,15	20	1,1	**A1563B0080000**	**10,04**
1,0	3,15	31,5	1,3	**A1563B0100000**	**9,31**
1,25	3,15	31,5	1,6	**A1563B0125000**	**9,78**
1,6	4	35,5	2	**A1563B0160000**	**9,58**
2,0	5	40	2,5	**A1563B0200000**	**10,84**
2,5	6,3	45	3,1	**A1563B0250000**	**11,50**
3,15	8	50	3,9	**A1563B0315000**	**13,28**
4,0	10	56	5	**A1563B0400000**	**19,55**



156.3N
DIN 333

Classic series | Type N
HSS
Radiales 60º Form A Izquierdas
Centre drills

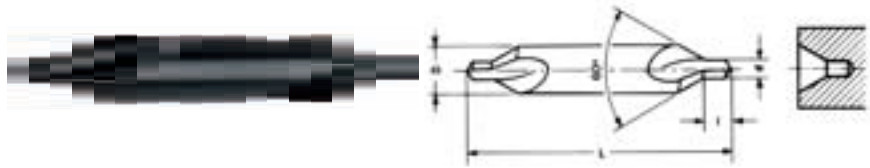
Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the strenghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Surface treated

Details and applications

This centre drill (DIN 333 Form A) is suitable for the production of 60º centre holes according to DIN 332, page 1, form A. It can also be used for the production of centre holes DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,8	3,15	20	1,1	**A1563N0080000**	**10,04**
1,0	3,15	31,5	1,3	**A1563N0100000**	**9,31**
1,25	3,15	31,5	1,6	**A1563N0125000**	**9,78**
1,6	4	35,5	2	**A1563N0160000**	**9,58**
2,0	5	40	2,5	**A1563N0200000**	**10,84**
2,5	6,3	45	3,1	**A1563N0250000**	**11,50**
3,15	8	50	3,9	**A1563N0315000**	**13,28**
4,0	10	56	5	**A1563N0400000**	**19,55**



156.34
DIN 333

Classic series | Type N | TiN
HSS

Radiales 60º Form A Izquierdas
Centre drills

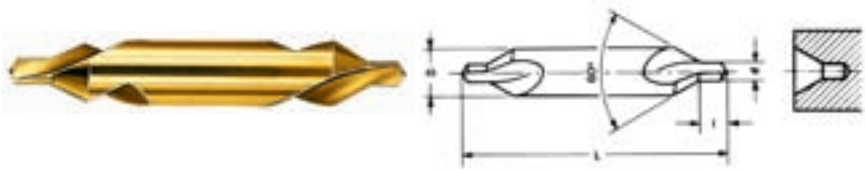
Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	Coated
Coating	TiN

Details and applications

This centre drill (DIN 333 Form A) is suitable for the production of 60º centre holes according to DIN 332, page 1, form A. It can also be used for the production of centre holes DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A,B and C.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,8	3,15	20	1,1	**A156340080000**	**28,31**
1,0	3,15	61,5	1,3	**A156340100000**	**26,26**
1,25	3,15	31,5	1,6	**A156340125000**	**27,73**
1,6	4	35,5	2	**A156340160000**	**27,03**
2,0	5	40	2,5	**A156340200000**	**30,30**
2,5	6,3	45	3,1	**A156340250000**	**32,41**
3,15	8	50	3,9	**A156340315000**	**37,31**
4,0	10	56	5	**A156340400000**	**55,21**



151.60
DIN 333

Classic series | Type N
HM

60º Form A
Centre drills

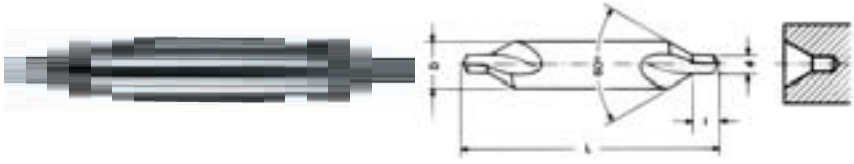
Design and technical specifications

Point angle	118º
Point grinding	Relieved cone
Tolerance d	k12
Other specifications	High metal removal rates are possible because of the streghthened form of the junction between pilot and body. This form cuts an annular groove which serves as a reservoir for coolant. The drill has a high resistance to breakage
Finish	No surface treatment, bright finish

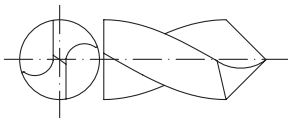
Details and applications

This centre drill (DIN 333 Form A) is suitable for the production of 60º centre holes according to DIN 332, page 1, form A-up to d=12,5mm. x D=26,5mm. It can also be used for the production of centre holes DIN 332, page 1, form C, in which the interior part to be centred is equal in forms A, B and C.

d	D	L	l	Code	Price
mm.	mm.	mm.	mm.		€
0,5	3,15	20	0,8	**A151600050000**	**50,04**
0,8	3,15	20	1,1	**A151600080000**	**48,46**
1,0	3,15	31,5	1,3	**A151600100000**	**53,04**
1,25	3,15	31,5	1,6	**A151600125000**	**51,38**
1,6	4	35,5	2	**A151600160000**	**53,93**
2,0	5	40	2,5	**A151600200000**	**62,76**
2,5	6,3	45	3,1	**A151600250000**	**74,08**
3,15	8	50	3,9	**A151600315000**	**85,47**
4,0	10	56	5	**A151600400000**	**113,96**
5,0	12,5	63	6,3	**A151600500000**	**199,48**
6,3	16	71	8	**A151600630000**	**313,44**



178.40
DIN 1897



Classic series | Type NC
HSSCo 5 %

N.C. Spotting drills 90º
Straight shank drills

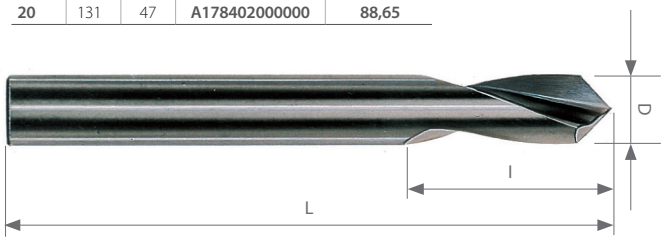
Design and technical specifications

Helix angle	Smaller than Standard
Point angle	90º
Point grinding	Relieved cone
Web thickness	Much smaller than normal
Web taper	Normal
Flute form	Uncleared wide flutes
Tolerance D	h6
Finish	No surface treatment, bright finish

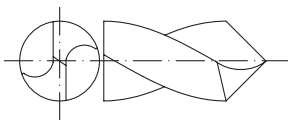
Details and applications

Drill bit designed with a thin core, cylindrical outer diameter without backing-off, a point angle of 90º and a lower-than-normal cutting lip height difference for fast dotting and exact positioning in jig borers, numerical control machines and machining centres. Also designed to carry out centring and bevelling of threaded holes in one single operation. Drilling a bigger depth than its diameter is not recommended.

D	L	l	Code	Price
mm.	mm.	mm.		€
3	46	12	**A178400300000**	**14,93**
4	55	16	**A178400400000**	**15,35**
5	62	18	**A178400500000**	**16,03**
6	66	20	**A178400600000**	**16,55**
8	79	26	**A178400800000**	**21,81**
10	89	30	**A178401000000**	**24,44**
12	102	35	**A178401200000**	**35,54**
16	115	40	**A178401600000**	**44,97**
20	131	47	**A178402000000**	**88,65**



178.60
LATZ NC



Classic series | Type NC
HM

N.C. Spotting drills 90º
Straight shank drills

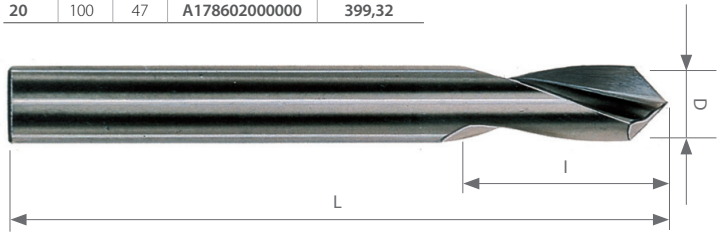
Design and technical specifications

Helix angle	Smaller than Standard
Point angle	90º
Point grinding	Relieved cone
Web thickness	Much smaller than normal
Web taper	Normal
Flute form	Uncleared wide flutes
Tolerance D	h6
Finish	No surface treatment, bright finish

Details and applications

Drill bit designed with a thin core, cylindrical outer diameter without backing-off, a point angle of 90º and a lower-than-normal cutting lip height difference for fast dotting and exact positioning in jig borers, numerical control machines and machining centres. Also designed to carry out centring and bevelling of threaded holes in one single operation. Drilling a bigger depth than its diameter is not recommended.

D	L	l	Code	Price
mm.	mm.	mm.		€
3	45	12	**A178600300000**	**41,41**
4	50	16	**A178600400000**	**44,45**
5	50	18	**A178600500000**	**47,42**
6	50	20	**A178600600000**	**50,32**
8	60	26	**A178600800000**	**65,17**
10	70	30	**A178601000000**	**91,73**
12	70	35	**A178601200000**	**133,21**
16	80	40	**A178601600000**	**221,95**
20	100	47	**A178602000000**	**399,32**



160.30
DIN 8374 N

Classic series | Type N
HSS

90º Conic step angle. Straight shank
Subland drills for housing screws

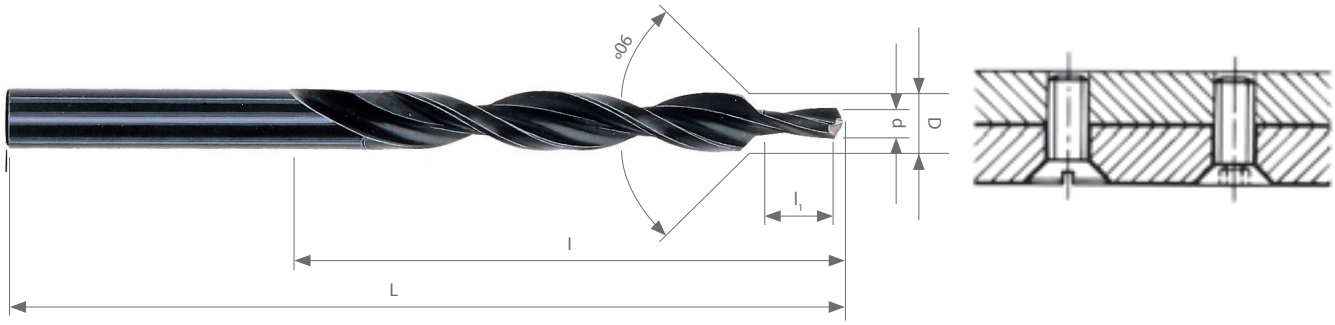
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	None
Flute form	Normal
Tolerance	h8 diameter D, h9 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Drill used for drilling through holes for screws, according to DIN 69 and countersinks to 90º for seating of countersunk screw heads according to DIN 74, sheet 1, form A (fine Tolerance D) and forms A & B (intermediate Tolerance D). For screws according to DIN 963 and 964.cutting speeds should be selected according to the large diameter and feeds according to the small diameter.

D	d	L	l	l_1	MT	Code	Price
mm.	mm.	mm.	mm.	mm.			€
6	3,2	93	57	9	M3	**A160300600000**	**48,23**
8	4,3	117	75	11	M4	**A160300800000**	**55,12**
10	5,3	133	87	13	M5	**A160301000000**	**67,84**
11,5	6,4	142	94	15	M6	**A160301150000**	**87,98**
15	8,4	169	114	19	M8	**A160301500000**	**126,14**
19	10,5	198	135	23	M10	**A160301900000**	**184,44**



162.30
DIN 8376 N

Classic series | Type N
HSS

180º Straight step angle. Straight shank
Subland drills for housing screws

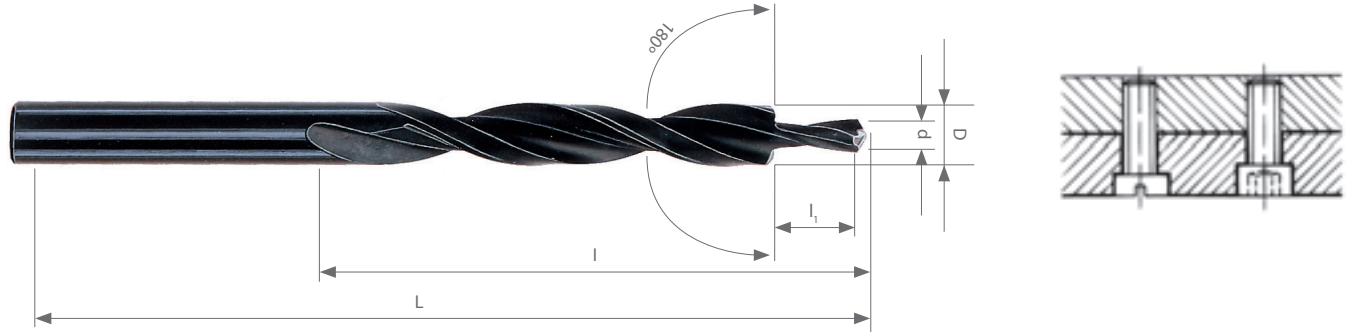
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	None
Flute form	Normal
Tolerance	h8 diameter D, h9 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Drill used for drilling through holes for screws, according to DIN 69 and counterbores (180º) for cheese head screws according to DIN 74, sheet 2 forms, H, J, and K (intermediate Tolerance D). For Allen screws according to DIN84, DIN912, DIN6912, DIN7513 and DIN 7984. cutting speeds should be selected according to the large diameter and feeds according to the small diameter.

D	d	L	l	l_1	MT	Code	Price
mm.	mm.	mm.	mm.	mm.			€
6	3,4	93	57	9	M3	**A162300600000**	**38,16**
8	4,5	117	75	11	M4	**A162300800000**	**45,05**
10	5,5	133	87	13	M5	**A162301000000**	**54,06**
11	6,6	142	94	15	M6	**A162301100000**	**62,54**
15	9,0	169	114	19	M8	**A162301500000**	**78,44**
18	11,0	191	130	23	M10	**A162301800000**	**163,24**



163.30
DIN 8377 N

Classic series | Type N
HSS

180º Straight step angle. Taper shank
Subland drills for housing screws

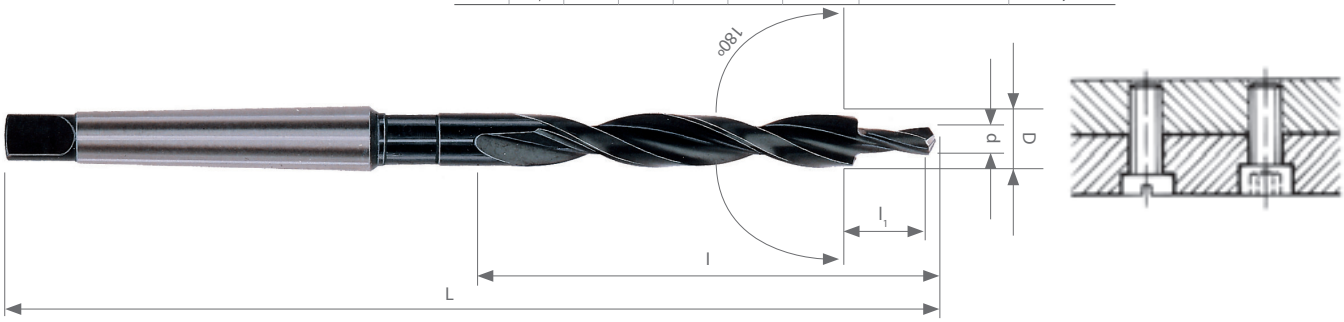
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	None
Flute form	Normal
Tolerance	h8 diameter D, h9 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Drill used for drilling through holes for screws, according to DIN 69 and counterbores (180º) for cheese head screws according to DIN 74, sheet 2 forms, H, J, and K (intermediate Tolerance D). For Allen screws according to DIN84, DIN912, DIN6912, DIN7513 and DIN 7984. cutting speeds should be selected according to the large diameter and feeds according to the small diameter.

D	d	L	l	l_1	MT	CM	Code	Price
mm.	mm.	mm.	mm.	mm.				€
10	5,5	168	87	13	M5	1	**A163301000000**	**79,50**
11	6,6	175	94	15	M6	1	**A163301100000**	**78,44**
15	9,0	212	114	19	M8	2	**A163301500000**	**101,76**
18	11,0	228	130	23	M10	2	**A163301800000**	**138,86**
20	13,5	238	140	27	M12	2	**A163302000000**	**166,42**
24	15,5	281	160	31	M14	3	**A163302400000**	**216,24**
26	17,5	286	165	35	M16	3	**A163302600000**	**250,16**
30	20,0	296	175	39	M18	3	**A163303000000**	**330,72**
33	22,0	334	185	43	M20	4	**A163303300000**	**343,44**



164.30
DIN 8378 N

Classic series | Type N
HSS

90º Conic step angle. Tap blind holes. Straight shank
Subland drills for housing screws

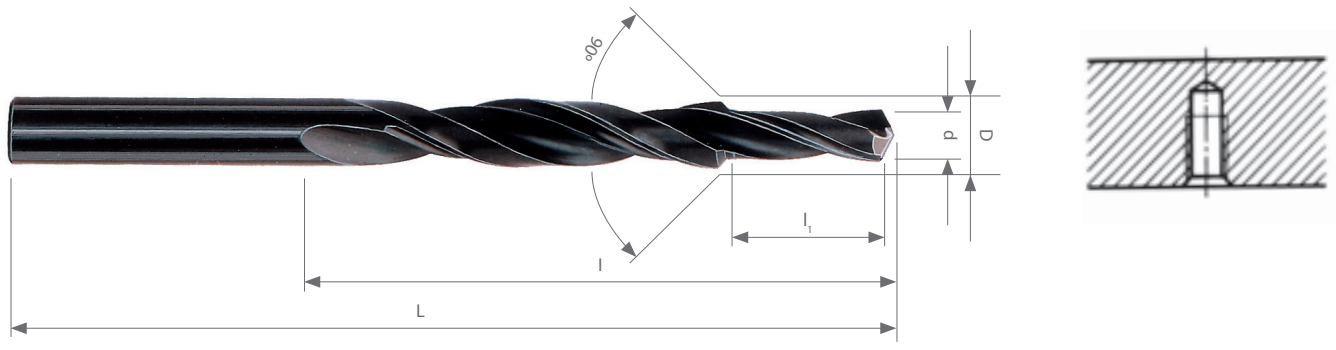
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Heavier than normal
Web taper	None
Flute form	Normal
Tolerance	h8 diameter D, h9 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Drill used for drilling tapping size holes according to DIN 336, sheet 1, and countersinks according to DIN 69 (intermediate performance). Cutting speeds should be selected according to the large diameter and feeds according to the small diameter.

D	d	L	l	l_1	MT	Code	Price
mm.	mm.	mm.	mm.	mm.			€
3,4	2,5	70	39	8,8	M3	**A164300340000**	**33,39**
4,5	3,3	80	47	11,4	M4	**A164300450000**	**36,04**
5,5	4,2	93	57	13,6	M5	**A164300550000**	**36,57**
6,6	5,0	101	63	16,5	M6	**A164300660000**	**41,87**
9	6,8	125	81	21	M8	**A164300900000**	**47,17**
11	8,5	142	94	25,5	M10	**A164301100000**	**59,36**
13,5	10,2	160	108	30	M12	**A164301350000**	**78,44**



167.30
LATZ N

Classic series HSS | Type N

60º Form D
Step drills for centre holes

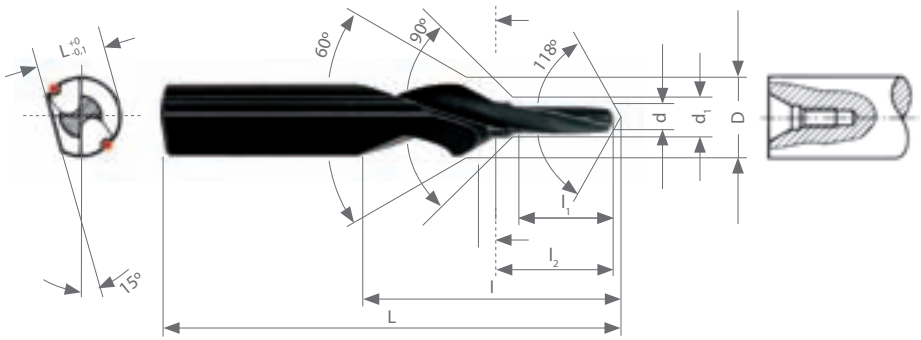
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance	h7 diameter D, h8 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Step drill for drilling and tapping 60º centre holes according to DIN 332, sheet 2, form D (direct, straight, face contact). Especially suitable for threading, centring and cutting of in machines where the work piece is simultaneously faced and centred in one operation.

D	d	d_1	L	l	l_1	l_2	MT	Code	Price
mm.	mm.	mm.	mm.	mm.	mm.	mm.			€
8	3,3	4,3	63	23	11	12,6	M4	**A167300800000**	**89,04**
10	4,2	5,3	67	27	13	15,15	M5	**A167301000000**	**100,70**
12,5	5,0	6,4	71	33	16	18,9	M6	**A167301250000**	**110,24**
14	6,8	8,4	88	41	19,5	23	M8	**A167301400000**	**104,94**
16	8,5	10,5	94	47	23	27,7	M10	**A167301600000**	**119,78**
20	10,2	13	105	59	28	34,5	M12	**A167302000000**	**156,88**
25	14,0	17	132	67	33	41,3	M16	**A167302500000**	**220,48**



168.30
LATZ N

Classic series HSS | Type N

60º Form DR
Step drills for centre holes

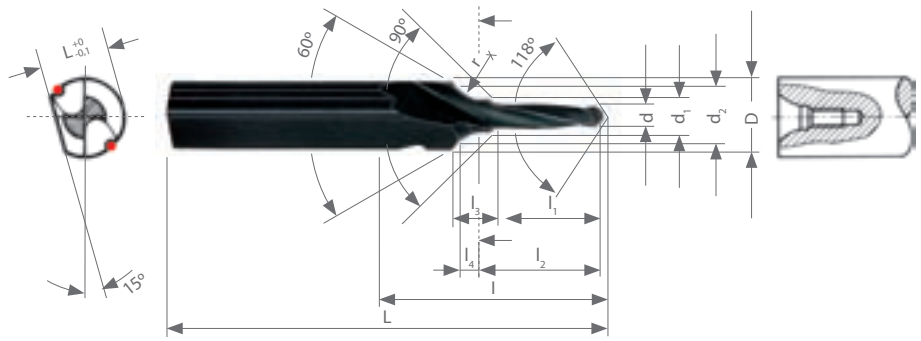
Design and technical specifications

Helix angle	Standard (DIN1414 type N)
Point angle	118º
Point grinding	Relieved cone and web thinned according to DIN 1412-A
Web thickness	Normal
Web taper	Normal
Flute form	Normal
Tolerance	h7 diameter D, h8 diameter d
Other specifications	DIN 1414
Finish	Surface treated

Details and applications

Stepped drill for drilling and tapping 60º centre holes according to DIN 332, sheet 2, form DR (perfect circular contact, thanks to radiused form). Especially suitable for threading, centring and cutting off in machines where the work piece is simultaneously faced and centred in one operation.

D	d	d_1	d_2	s	L	l	l_1	l_2	l_3	l_4	r	MT	Code	Price
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.			€
8	3,3	4,3	6,7	6,75	63	23	11	12,6	4,25	2,1	5	M4	**A168300800000**	**94,34**
10	4,2	5,3	8,1	8,45	67	27	13	15,15	5,38	2,4	6,3	M5	**A168301000000**	**102,82**
12,5	5	6,4	9,6	10,45	71	33	16	18,9	6,95	2,8	8	M6	**A168301250000**	**113,42**
14	6,8	8,4	12,2	12,5	88	41	19,5	23	7,7	3,3	10	M8	**A168301400000**	**115,54**
16	8,5	10,5	14,9	14,85	94	47	23	27,7	9,58	3,85	16	M10	**A168301600000**	**133,56**
20	10,2	13	18,1	18,45	105	59	28	34,5	12,06	4,4	20	M12	**A168302000000**	**172,78**
25	14	17	23	23,4	132	67	33	41,3	14,77	5,2	25	M16	**A168302500000**	**239,56**



664.63
DIN 8378 N

Optimus series HM | Type SN | TiAlN

90° Conic step angle. Tap blind holes. Straight shank

Subland drills for housing screws

Design and technical specifications

Helix angle	30°
Point angle	140°
Point grinding	4 Lands with web thinning
Web thickness	Heavier than normal
Web taper	Normal
Flute form	Super-N
Tolerance D	h6 diameter D, h8 diameter d
Other specifications	DIN 6535 HA
Finish	Coated
Coating	TiAlN

Details and applications

High production helicoidal drills, TiAlN coated, to reach optimal hole quality at economic cost. To drill castings, cast steel,Cr-Ni steels, alloyed steels (cementation steels, tools steels spring steels etc..). Titanium and its alloys, stainless steels (martensitic, austenitic) special alloys with Co-Ni-Fe base etc..Drill used for drilling tapping size holes according to DIN 336, sheet 1, and countersinks according to DIN 69 (intermediate performance). cutting speeds should be selected according to the large diameter and feeds according to the small diameter.

D	d	L	l	l_1	MT	Code	Price
mm.	mm.	mm.	mm.	mm.			€
6	2,5	66	20	8,8	M3	**A664630300000**	**33,49**
6	3,3	66	24	11,4	M4	**A664630400000**	**38,70**
6	4,2	66	28	13,6	M5	**A664630500000**	**44,13**
8	5,0	79	34	16,5	M6	**A664630600000**	**55,19**
10	6,8	89	47	21	M8	**A664630800000**	**71,67**
12	8,5	102	55	25,5	M10	**A664631000000**	**99,10**
14	10,2	107	60	30	M12	**A664631200000**	**132,06**

129.00 | Boxed sets of straight shank drills

Family	Box type	Norm D	Material	Finish	Grinding	Family	Code	Price €
105.30	D 1 - 7 x 0,50	DIN 338	HSS		Type N	Classic series	A129301051300	57,22
105.30	D 1 - 10 x 0.50	DIN 338	HSS		Type N	Classic series	A129301051900	85,47
105.30	D 1 - 13 x 0,50	DIN 338	HSS		Type N	Classic series	A129301052500	152,73
105.30	D 6 - 10 x 0,10	DIN 338	HSS		Type N	Classic series	A129301054100	332,00
105.30	D 1 - 6 x 0,10	DIN 338	HSS		Type N	Classic series	A129301055000	162,88
105.34	D 1 - 7 x 0,50	DIN 338	HSS	TiN	Type N	Classic series	A129341051300	91,68
105.34	D 1 - 10 x 0.50	DIN 338	HSS	TiN	Type N	Classic series	A129341051900	164,55
105.34	D 1 - 13 x 0,50	DIN 338	HSS	TiN	Type N	Classic series	A129341052500	325,97
105.34	D 6 - 10 x 0,10	DIN 338	HSS	TiN	Type N	Classic series	A129341054100	705,49
105.34	D 1 - 6 x 0,10	DIN 338	HSS	TiN	Type N	Classic series	A129341055000	299,59
180.40	D 1 - 7 x 0,50	DIN 338	HSSCo 5 %		Type NF	Classic series	A129401801300	76,23
180.40	D 1 - 10 x 0.50	DIN 338	HSSCo 5 %		Type NF	Classic series	A129401801900	126,10
180.40	D 1 - 13 x 0,50	DIN 338	HSSCo 5 %		Type NF	Classic series	A129401802500	260,45
180.40	D 6 - 10 x 0,10	DIN 338	HSSCo 5 %		Type NF	Classic series	A129401804100	473,76
180.40	D 1 - 6 x 0,10	DIN 338	HSSCo 5 %		Type NF	Classic series	A129401805000	231,42
181.40	D 1 - 7 x 0,50	DIN 338	HSSCo 5 %		Type NG	Classic series	A129401811300	86,73
181.40	D 1 - 10 x 0.50	DIN 338	HSSCo 5 %		Type NG	Classic series	A129401811900	161,00
181.40	D 1 - 13 x 0,50	DIN 338	HSSCo 5 %		Type NG	Classic series	A129401812500	304,60
181.40	D 6 - 10 x 0,10	DIN 338	HSSCo 5 %		Type NG	Classic series	A129401814100	675,20
181.40	D 1 - 6 x 0,10	DIN 338	HSSCo 5 %		Type NG	Classic series	A129401815000	300,85
183.43	D 1 - 7 x 0,50	DIN 338	HSSCo 5 %	TiAlN	Tipo SLZ	Optimus series	A129431831300	173,77
183.43	D 1 - 10 x 0.50	DIN 338	HSSCo 5 %	TiAlN	Tipo SLZ	Optimus series	A129431831900	355,28
183.43	D 1 - 13 x 0,50	DIN 338	HSSCo 5 %	TiAlN	Tipo SLZ	Optimus series	A129431832500	776,09
183.43	D 6 - 10 x 0,10	DIN 338	HSSCo 5 %	TiAlN	Tipo SLZ	Optimus series	A129431834100	1572,89
183.43	D 1 - 6 x 0,10	DIN 338	HSSCo 5 %	TiAlN	Tipo SLZ	Optimus series	A129431835000	616,88
183.44	D 1 - 7 x 0,50	DIN 338	HSSCo 5 %	TiN	Tipo SLZ	Optimus series	A129441831300	228,06
183.44	D 1 - 10 x 0.50	DIN 338	HSSCo 5 %	TiN	Tipo SLZ	Optimus series	A129441831900	465,95
183.44	D 1 - 13 x 0,50	DIN 338	HSSCo 5 %	TiN	Tipo SLZ	Optimus series	A129441832500	1022,57
183.44	D 6 - 10 x 0,10	DIN 338	HSSCo 5 %	TiN	Tipo SLZ	Optimus series	A129441834100	1863,61
183.44	D 1 - 6 x 0,10	DIN 338	HSSCo 5 %	TiN	Tipo SLZ	Optimus series	A129441835000	814,58
620.63	D 3,3 - 4,2 - 5 - 6,8 - 8,5 - 10,2	DIN 6537 L 5 X D	HM	TiAlN	Type SN	Optimus series	A129636220600	193,00
640.63	D 3,3 - 4,2 - 5 - 6,8 - 8,5 - 10,2	DIN 6537 L 5 X D	HM	TiAlN	Type SN	Optimus series	A129636420600	308,00

Serie Optimus | cutting conditions

Work conditions							Coolant	
N°	Work material	Resistance N/mm2 -- Mpa	Hardness	Internal cooling	from	to		3
1	Easy to machine mild steels (high sulphur carbon steels aphosphorus)	≤ 500		❍	110	130	(A) (B)	0,100
				⊛	120	145		0,100
2	Non-alloyed carbon steels (≤0,4%C) (structural steels)	≤ 800		❍	120	145	(A) (B)	0,080
				⊛	140	170		0,080
3	Non-alloyed carbon steels (≤0,4%C)	800-1.000		❍	95	110	(A) (B)	0,130
	Hardness of casehardened and bonified steels	≤ 700		⊛	110	130		0,130
4	Non-alloyed fine steels, low-alloyed steels (nitrided)	800-1000		❍	90	105	(A) (B)	0,080
	Casehaedened and bonified alloyed structural steels	700-1000		⊛	100	120		0,100
	Tool steels	≤ 850		❍	60	70	(A) (B)	0,060
				⊛	75	85		0,060
5	Tool alloyed steels	800-1.000		❍	50	60	(A) (B)	0,060
				⊛	60	70		0,060
	Bonified fine alloyed steels (undeformable, moldings)	1.000-1.200		❍	85	100		0,080
				⊛	85	105		0,100
6	Austenitic sulphurated stainless steels easy to machine	≤ 850		❍	50	55	(B)	0,050
				⊛	55	60		0,060
7	Cr-Mo ferritic and martensitic stainless steels	≤ 850		❍	40	45	(B)	0,040
				⊛	40	45		0,060
8	Cr-Ni austenitic, stainless and highly heat-resistant steels (refractory)	≤ 850		❍	40	45	(B)	0,050
				⊛	50	55		0,060
9	Martensitic stainless steels. Tempered steels		45-50 HRC	❍	20	25	(B)	0,040
				⊛	25	35		0,040
			50-63 HRC	❍	10	12		0,020
				⊛	10	15		0,020
10	Special alloys: Nimonic, Hastelloy, Inconel, K-Monel etc.	≤ 900		❍	22	28	(B)	0,020
				⊛	28	32,5		0,030
		900 ÷ 1.200		❍	13	15		0,020
				⊛	18	22		0,020
		≥1.200		❍	11	12		0,020
				⊛	12,5	14		0,020
	Titanium and its alloys	≤ 750		❍	40	45		0,050
				⊛	45	50		0,050
		≥ 750		❍	25	35		0,040
				⊛	40	45		0,040
11	Spring steel	>1.300		❍	42	47	(B)	0,040
				⊛	57	62		0,040
12	Mangenese steels	>1.300		❍	25	30	(B)	0,050
				⊛	30	35		0,050
13	Grey casting		< 250 HB	❍	130	160	(A) (D)	0,130
				⊛	150	200		0,130
	Nodular casting and malleable casting			❍	112,5	140	(A)	0,100
				⊛	130	155		0,130
	Grey casting		< 350 HB	❍	112,5	155	(A) (D)	0,100
				⊛	127,5	160		0,130
	Nodular casting and malleable casting			❍	105	125	(A)	0,080
				⊛	115	130		0,100
14	Hardened casting		> 350 HB	❍	32	37	(A) (D)	0,040
				⊛	37	42		0,040

Coolant: (A) Soluble oil · (B) Cutting oil · (C) Dry · (D) Compressed air · (E) Water

Internal cooling: ❍ No internal cooling · ⊛ With internal cooling

Feed (mm/rev) based on diameter of the drill									
4	5	6	8	10	12	16	20	25	30
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,100	0,100	0,160	0,200	0,250	0,250	0,310	0,400	0,500	0,500
0,100	0,100	0,160	0,200	0,250	0,250	0,310	0,400	0,500	0,500
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,100	0,100	0,160	0,200	0,250	0,250	0,310	0,400	0,500	0,500
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,100	0,100	0,160	0,200	0,250	0,250	0,310	0,400	0,500	0,500
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,080	0,080	0,130	0,160	0,200	0,200	0,250	0,310	0,400	0,400
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,040	0,040	0,060	0,080	0,100	0,100	0,120	0,160	0,200	0,200
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,030	0,030	0,040	0,050	0,060	0,060	0,080	0,100	0,120	0,120
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,060	0,060	0,100	0,120	0,160	0,160	0,200	0,250	0,310	0,310
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,180	0,180	0,250	0,310	0,400	0,400	0,500	0,630	0,800	0,800
0,100	0,100	0,160	0,200	0,250	0,250	0,310	0,400	0,500	0,500
0,140	0,140	0,200	0,250	0,310	0,310	0,400	0,500	0,630	0,630
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255
0,050	0,050	0,080	0,100	0,130	0,130	0,160	0,205	0,255	0,255

Cutting speed must be multiplied by acorrection factor based on the ratiobetwen the hole depth and the drilldiameter.

Hole Depth / drill diam. = 1	S = 1,15
Hole Depth / drill diam. = 3	S = 1,00
Hole Depth / drill diam. = 4	S = 0,90
Hole Depth / drill diam. = 5	S = 0,80
Hole Depth / drill diam. = 8	S = 0,70
Hole Depth / drill diam. = 12	S = 0,60
Hole Depth / drill diam. >= 15	S = 0,50

The cutting feed must be multiplied by a correction factor based on the ratio betwen the hole depth and the drill diamter.

Hole depth / drill diam. <= 3	f = 1
Hole depth / drill diam. > 3	f = 0,9
Hole depth / drill diam. > 5	f = 0,8
Hole depth / drill diam. > 8	f = 0,7
Hole depth / drill diam. > 12	f = 0,6

Example

Material: GG35
Grey Casting <300HB
Drill Diameter Ø 6
Hole Depth = 28
28 / 6 =4,66 S = 0,80 f = 0,9

Drill with Futura Coating
Vc(s/table) = 130 m/min
Vc(to be used): 130 x 0,80 = **104 m/min**
Av(s/table) = 0,30mm/rev
Av(to be used): 0,30 x 0,9 = **0,27 mm/rev**

These values are useful with enough coolant supply and high stability. Reduce values in case of different conditions.

Drilling diametres before threading

M		
M	P	Ø
1	0,25	0,75
1,1	0,25	0,85
1,2	0,25	0,95
1,4	0,30	1,10
1,6	0,35	1,25
1,7	0,35	1,30
1,8	0,35	1,45
2	0,40	1,60
2,2	0,45	1,75
2,3	0,40	1,90
2,5	0,45	2,05
2,6	0,45	2,10
3	0,50	2,50
3,5	0,60	2,90
4	0,70	3,30
4,5	0,75	3,70
5	0,80	4,20
6	1,00	5,00
7	1,00	6,00
8	1,25	6,80
9	1,25	7,80
10	1,50	8,50
11	1,50	9,50
12	1,75	10,20
14	2,00	12,00
16	2,00	14,00
18	2,50	15,50
20	2,50	17,50
22	2,50	19,50
24	3,00	21,00
27	3,00	24,00
30	3,50	26,50
33	3,50	29,50
36	4,00	32,00
39	4,00	35,00
42	4,50	37,50
45	4,50	40,50
48	5,00	43,00
52	5,00	47,00
56	5,50	50,50
60	5,50	54,50
64	6,00	58,00
68	6,00	62,00

MF		
M	P	Ø
2,5	0,35	2,15
3	0,35	2,65
3,5	0,35	3,15
4	0,35	3,65
4	0,50	3,50
4,5	0,50	4,00
5	0,50	4,50
5,5	0,50	5,00
6	0,50	5,50
6	0,75	5,20
7	0,75	6,20
8	0,50	7,50
8	0,75	7,20
8	1,00	7,00
9	0,75	8,20
9	1,00	8,00
10	0,50	9,50
10	0,75	9,20
10	1,00	9,00
10	1,25	8,80
11	0,75	10,20
11	1,00	10,00
12	0,75	11,25

MF		
M	P	Ø
12	1,00	11,00
12	1,25	10,80
12	1,50	10,50
13	1,00	12,00
13	1,50	11,50
13	1,75	11,25
14	1,00	13,00
14	1,25	12,80
14	1,50	12,50
15	1,00	14,00
15	2,00	13,00
16	1,00	15,00
16	1,50	14,50
17	1,00	16,00
17	1,50	15,50
18	1,00	17,00
18	1,50	16,50
18	2,00	16,00
20	1,00	19,00
20	1,50	18,50
20	2,00	18,00
22	1,00	21,00
22	1,50	20,50
22	2,00	20,00
24	1,00	23,00
24	1,50	22,50
24	2,00	22,00
25	1,00	24,00
25	1,50	23,50
25	2,00	23,00
26	1,00	25,00
26	1,50	24,50
27	1,00	26,00
27	1,50	25,50
27	2,00	25,00
28	1,00	27,00
28	1,50	26,50
28	2,00	26,00
30	1,00	29,00
30	1,50	28,50
30	2,00	28,00
30	3,00	27,00
32	1,50	30,50
32	2,00	30,00
33	1,50	31,50
33	2,00	31,00
33	3,00	30,00
34	1,50	32,50
35	1,50	33,50
36	1,50	34,50
36	2,00	34,00
36	3,00	33,00
38	1,50	36,50
39	1,50	37,50
39	2,00	37,00
39	3,00	36,00
40	1,50	38,50
40	2,00	38,00
40	3,00	37,00
42	1,50	40,50
42	2,00	40,00
42	3,00	39,00
45	1,50	43,50
45	2,00	43,00
45	3,00	42,00
48	1,50	46,50
48	2,00	46,00
48	3,00	45,00
50	1,50	48,50
50	2,00	48,00
50	3,00	47,00
52	1,50	50,50
52	2,00	50,00
52	3,00	49,00

COLD FORMING		
M	P	Ø
3	0,50	2,75
4	0,70	3,65
4,5	0,75	4,15
5	0,80	4,60
5	0,90	4,55
6	1,00	5,50
7	1,00	6,50
8	1,25	7,40
10	1,50	9,30
12	1,75	11,20
14	2,00	13,10
16	2,00	15,10
18	2,50	16,90
20	2,50	18,90
22	2,50	20,90
24	3,00	22,65

W		
W	Threads	Ø
3/32	48	1,80
1/8	40	2,50
5/32	32	3,10
3/16	24	3,60
7/32	24	4,40
1/4	20	5,10
5/16	18	6,50
3/8	16	7,90
7/16	14	9,30
1/2	12	10,50
9/16	12	12,00
5/8	11	13,50
3/4	10	16,50
7/8	9	19,25
1	8	22,00
1 1/8	7	24,75
1 1/4	7	27,75
1 3/8	6	30,50
1 1/2	6	33,50
1 5/8	5	35,50
1 3/4	5	39,00
1 7/8	4,5	41,50
2	4,5	44,50
2 1/4	4	50,00
2 1/2	4	56,00
2 3/4	3,5	62,00
3	3,5	68,50

UNC		
UNC	Threads	Ø
Nº 1	64	1,50
Nº 2	56	1,80
Nº 3	48	2,10
Nº 4	40	2,30
Nº 5	40	2,60
Nº 6	32	2,85
Nº 8	32	3,50
Nº 10	24	3,90
Nº 12	24	4,50
1/4	20	5,20
5/16	18	6,60
3/8	16	8,00
7/16	14	9,40
1/2	13	10,75
9/16	12	12,25
5/8	11	13,50
3/4	10	16,50
7/8	9	19,50
1	8	22,25
1 1/8	7	25,00
1 1/4	7	28,25
1 3/8	6	30,75
1 1/2	6	34,00
1 3/4	5	39,50
2	4,5	45,25
2 1/4	4,5	51,20
2 1/2	4	57,25
2 3/4	4	63,50
3	4	70,00

UNF-SAE		
UNF	Threads	Ø
Nº 0	80	1,30
Nº 1	72	1,60
Nº 2	64	1,90
Nº 3	56	2,10
Nº 4	48	2,40
Nº 5	44	2,70
Nº 6	40	3,00
Nº 8	36	3,50
Nº10	32	4,10
Nº 12	28	4,70
1/4	28	5,50
5/16	24	6,90
3/8	24	8,50
7/16	20	9,90
1/2	20	11,50
9/16	18	12,90
5/8	18	14,50
3/4	16	17,50
7/8	14	20,40
1	12	23,30
1 1/8	12	26,50
1 1/4	12	29,50
1 3/8	12	32,70
1 1/2	12	36,50

GAS (BSP)		
GAS (BSP)	Threads	Ø
1/8	28	8,80
1/4	19	11,80
3/8	19	15,25
1/2	14	19,00
5/8	14	21,00
3/4	14	24,50
7/8	14	28,25
1	11	30,75
1 1/8	11	35,50
1 1/4	11	39,50
1 3/8	11	42,00
1 1/2	11	45,20
1 3/4	11	51,40
2	11	57,20
2 1/4	11	63,30
2 3/8	11	67,00
2 1/2	11	72,80
2 3/4	11	79,10
3	11	85,50

BSPT (RC)		
BSPT (RC)	Threads	Ø
1/16	28	
1/8	28	
1/4	19	
3/8	19	
1/2	14	
3/4	14	
1	11	
1 1/4	11	
1 1/2	11	
2	11	

UNEF		
UNEF	Threads	Ø
Nº 12	32	4,70
1/4	32	5,55
5/16	32	7,15
3/8	32	8,70
7/16	28	10,20
1/2	28	11,80
9/16	24	13,20
5/8	24	14,80
3/4	20	17,80
7/8	20	20,95
1	20	24,10
1 1/8	18	27,15
1 1/4	18	30,35
1 3/8	18	33,60
1 1/2	18	36,70

BA		
BA	Ø x P	Ø
8	2,20x0,43	1,80
7	2,50x0,48	2,00
6	2,80x0,53	2,30
5	3,20x0,59	2,60
4	3,60x0,66	3,00
3	4,10x0,73	3,40
2	4,70x0,81	4,00
1	5,30x0,90	4,50
0	6,00x1,00	5,10
7/8	20	20,95
1	20	24,10
1 1/8	18	27,15
1 1/4	18	30,35
1 3/8	18	33,60
1 1/2	18	36,70

PG		
PG	Threads	Ø
07	20	11,40
09	18	14,00
11	18	17,25
13,5	18	19,00
16	18	21,25
21	16	26,75
29	16	35,50
36	16	45,50
42	16	52,50
48	16	58,00

NPT		
NPT	Threads	Ø
1/16	27	6,20
1/8	27	8,50
1/4	18	11,00
3/8	18	14,50
1/2	14	17,80
3/4	14	23,00
1	11,5	29,00
1 1/4	11,5	37,50
1 1/2	11,5	44,00
2	11,5	56,00

Materials and Coatings

HSS MATERIALS									
Description	Steel type	Material	AISI	Proportion					
				C	Cr	Mo	V	W	Co
HSS	S 6-5-2	1.3343	M2	0,9	4,15	4,95	1,85	6,35	-
HSS-Co	S 6-5-2-5	1.3243	M35	0,92	4,15	4,95	1,85	6,35	4,75

HARD METAL MATERIALS					
	Description	Composition		Hardness en HV	Stiffness (N/mm²)
		Co (%)	WC (%)		
Standard	K10/20	8	92	1.710	3.200
Optimus	K30/40	10	90	1.610	3.600

Coating Material	Microhardness (HV 0.05)	Friction coefficient against steel (dry)	Max. service temperature	Coating colour
TiN	2,300	0,4	600	gold-yellow
TiAlN	3,300	0,30-0,35	900	violet-grey

Packing

Family	PACKING								Cat. Page
	< Ø	QTY.	< Ø	QTY.	< Ø	QTY.	< Ø	QTY.	
100.30	6,50	10	13,00	5	16,00	4			36
100.40	6,50	10	13,00	5	16,00	4			37
100.60		1							17
102.30	6,50	10	13,00	5	16,00	4			38
105.30	9,00	10	14,00	5	16,00	3	20,00	1	39
105.34	9,00	10	14,00	5	16,00	3	20,00	1	41
105.60		1							18
107.30	9,00	10	14,00	5	16,00	3	20,00	1	45
108.30	9,00	10	14,00	5	16,00	3	20,00	1	46
109.30	9,00	10	14,00	5	16,00	3	20,00	1	47
111.30	9,00	10	14,00	5	16,00	3	20,00	1	48
115.30	5,90	10	11,75	5	16,00	3			49
118.30	5,90	10	11,75	5	16,00	3			50
121.30	4,50	10	12,00	5					52
122.30	4,50	10	12,00	5					53
123.30	4,50	10	12,00	5					54
124.30	4,50	10	12,00	5					55
124.40		1							33
125.30	4,50	10	12,00	5					56
125.40		1							34
126.30	4,50	10	12,00	5					57
126.40		1							35
130.30	7,75	5	11,75	3	70,00	1			58
130.34	7,75	5	11,75	3	70,00	1			60
136.30	7,75	5	11,75	3	70,00	1			63
138.30	7,75	5	11,75	3	70,00	1			64
141.30		1							66
142.30		1							67
143.30		1							68
144.30		1							69
150.34		10							71
150.3B		10							70
150.3N		10							70
151.34		10							72
151.3B		10							71
151.3N		10							72
151.60		1							77
152.34		10							74

Family	PACKING								Cat. Page
	< Ø	QTY.	< Ø	QTY.	< Ø	QTY.	< Ø	QTY.	
152.3B		10							73
152.3N		10							73
153.34		10							75
153.3B		10							74
153.3N		10							75
156.34		10							77
156.3B		10							76
156.3N		10							76
160.30	M-4	5	M-6	3	M-10	1			79
162.30	M-4	5	M-6	3	M-10	1			79
163.30		1							80
164.30	M-8	5	M-12	3					80
167.30	M-8	5	M-16	3					81
168.30	M-8	5	M-16	3					81
178.40	6,50	10	13,00	5	16,00	4			78
178.60		1							78
180.40	9,00	10	14,00	5	16,00	3	20,00	1	43
181.40		1							27
182.40	5,90	10	11,75	5	16,00	3			51
183.43		1							23
183.44		1							25
184.43		1							29
184.44		1							31
185.43		1							19
185.44		1							21
192.40	7,75	5	11,75	3	70,00	1			62
250.30	7,75	5	11,75	3	70,00	1			65
610.63		1							8
620.63		1							10
630.63		1							9
640.63		1							11
650.63		1							12
660.63		1							13
664.63		1							82
670.63		1							14
680.63		1							15
690.63		1							16

Notes

Notes

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