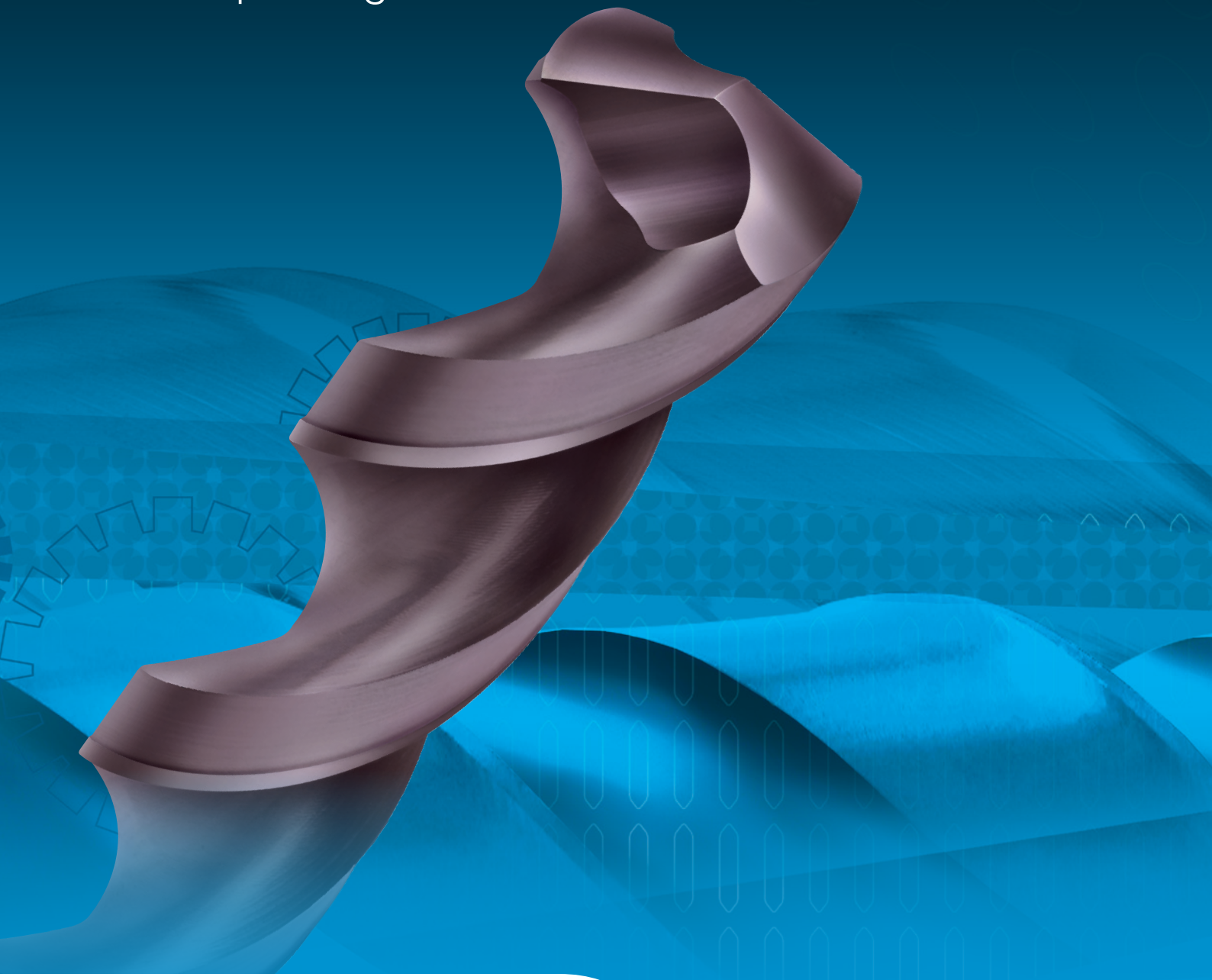
Drill deeper…

with less pecking



DH SERIES DRILLS

AUSTRALIAN MADE

suttontools
world class cutting tools

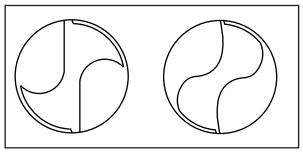
Drill Deeper...

with less pecking.

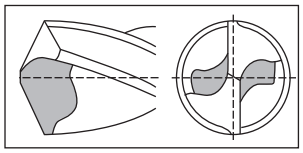
Sutton Tools Deep Hole (DH) Series provides a highly productive solution for deep hole drilling in tough materials. Geometry, material and coating optimised for high quality drilling from 3 to 12 x Ø. in depth, on small to medium batch sizes.

Tool Design

Sutton DH drill series features a parabolic flute style (see diagram below), which enables a larger core diameter & more flute space over the standard flute design, resulting in heavier feed & less pecking. In addition to this, the 40° helix angle with rake correction provides a very strong cutting edge & excellent chip evacuation for a wide range of materials.
The U-point geometry creates a constant rake angle along the entire cutting edge width, resulting in controlled chip breakage and centering.



Conventional Flute | Parabolic Flute



Rake Correction | U Point Geometry

Standard Point Chip Form

U-Point Chip Form

Material

DH drills are made from a Cobalt grade of high speed steel, possessing excellent cutting properties, high-red hardness and good toughness. This offers performance in a wide range of materials, particularly steels to a hardness of 1200 N/mm^2.

Coating

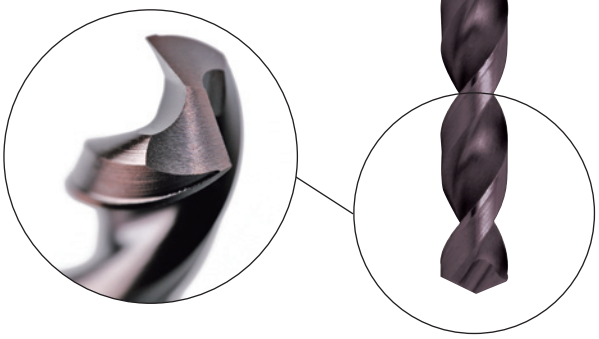
The DH Series is complimented by the latest generation of TiAlN (Futura Nano) coating suitable in applications where there is high thermal load. TiAlN has a nano-layered structure which is engineered to give an optimum balance between hardness & internal stress.

Features

- 130° profile web thinned U-point geometry ensures high strength
- Fast 40° Helix
- Parabolic flute design for optimal chip transportation
- Cobalt grade high speed steel (HSS Co)
- TiAlN coating for longer tool life

Benefits

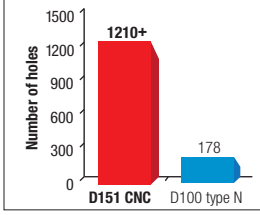
- Controlled centering & chip breakage
- Increased stability
- Fast chip evacuation
- Less pecking required
- Improved heat dissipation



Case Study – Performance Comparison

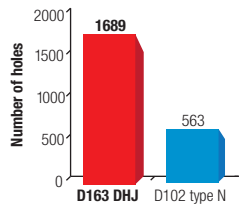
A recent study was conducted comparing the tool life between the DH series & a conventional drill.
The graph clearly indicates the longer tool life at higher cutting speeds of the DH series ▸

Test 1



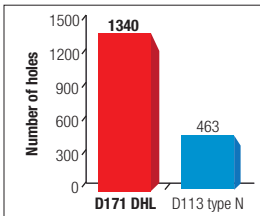
Material:	P20 / 35CrMo4 / 1.2330	
Size:	6,3mm	
Depth:	16mm	
	D151	**D100**
Vc(m/mm):	35	20
F (m/rev):	0,17	0,13
N (RPM):	1767	1010
F (mm/min):	300	131

Test 2



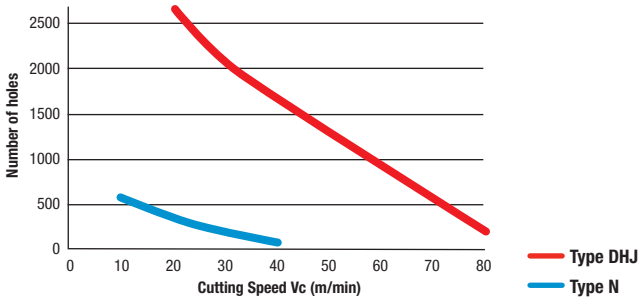
Material:	4140 / 41CrMo41 / .7223	
Size:	4,5mm	
Depth:	18mm	
	D163	**D102**
Vc(m/mm):	40	20
F (m/rev):	0,1	0,07
N (RPM):	2019	1010
F (mm/min):	200	71

Test 3



Material:	1045 / C45 / 1.0503	
Size:	2,5mm	
Depth:	11mm	
	D171	**D113**
Vc(m/mm):	20	12
F (m/rev):	0,07	0,06
N (RPM):	1010	606
F (mm/min):	71	36

Tool Life Comparison - Cutting Speed Vs Number of Holes



Tool:	**Type DHJ**	**Type N**
Material:	4140 / 41CrMo4 / 1.7223	
Diameter (mm):	4.5	
Depth (mm):	18	
Soluble Oil:	7%	
Feed (mm/rev):	0.1	0.07
Vc:	**Number of holes**	
10	-	563
20	2680	342
30	2090	178
40	1689	43
80	194	-

suttontools

ISO	VDI	Material Group	Sutton	
P	A	Steel	N	UNI
M	R	Stainless Steel	VA	
K	F	Cast Iron	GG	
N	N	Non-Ferrous Metals, Aluminiums & Coppers	Al W	
S	S	Titaniums & Super Alloys	Ti	Ni
H	H	Hard Materials (≥ 45 HRC)	H	

Page	4	4	6	6	8	8	9	9	9	9	9	9	10	10	10
Catalogue Code	D146	D151	D158	D163	D170	D171	D191	D194	D192	D195	D193	D196	D197	D198	D199
Material	HSS Co							HSS Co	HSS	HSS Co	HSS	HSS Co	HSS		
Surface Finish	*Brt*	*TiAlN*	*Brt*	*TiAlN*	*Brt*	*TiAlN*	*Ni+Blu*	*TiAlN*	*Ni+Blu*	*TiAlN*	*Ni+Blu*	*TiAlN*	*Brt*		
Sutton Designation	NH						NH						N		
Standard	DIN 1897		DIN 338		DIN 340		DIN 1869-1		DIN 1869-2		DIN 1869-3		-		
Depth of Cut	≤3×Ø		≤ 5×Ø		8×Ø		≤10×Ø		≤12×Ø		≤14×Ø		≤10xØ	≤12xØ	≤14xØ
Shank Tolerance	h9												h9		

ISO	VDI 3323	Material		Condition	HB	N/mm²														
P	1	Steel - Non-alloy, cast & free cutting	~ 0.15 %C	A	125	440	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2		~ 0.45 %C	A	190	640	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3			QT	250	840	●	●	●	●	●	●	●	●	●	●	●	●	○	○
	4		~ 0.75 %C	A	270	910	●	●	●	●	●	●	●	●	●	●	●	●	○	○
	5			QT	300	1010	○	●	○	●	○	●	○	●	○	●	○	●		
	6	Steel - Low alloy & cast < 5% of alloying elements		A	180	610	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	7			QT	275	930	●	●	●	●	●	●	○	●	○	●	○	●	○	○
	8			QT	300	1010	○	●	○	●	○	●	○	●	○	●	○	●		
	9			QT	350	1180		○		○		○		○		○		○		
	10	Steel - High alloy, cast & tool		A	200	680	○	●	○	●	○	●	○	●	○	●	○	●		
	11			HT	325	1100		○		○		○		○		○		○		
	12	Steel - Corrosion resistant & cast	Ferritic / Martensitic	A	200	680	○	○		○		○		○		○		○		
	13		Martensitic	QT	240	810	○	○		○		○		○		○		○		
M	14.1	Stainless Steel	Austenitic	AH	180	610	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	14.2		Duplex		250	840	○	○												
	14.3		Precipitation Hardening		250	840	○	●		○		○	○	○	○	○	○	○	○	○
K	15	Cast Iron - Grey (GG)	Ferritic / Pearlitic		180	610	○	●	○	●	○	●	○	●	○	●	○	●	○	○
	16		Pearlitic		260	880	○	●	○	●	○	●	○	●	○	●	○	●		
	17	Cast Iron - Nodular (GGG)	Ferritic		160	570	○	●	○	●	○	●	○	●	○	●	○	●	○	○
	18		Pearlitic		250	840	○	●	○	●	○	●	○	●	○	●	○	●		
	19	Cast Iron - Malleable	Ferritic		130	460	○	●	○	●	○	●	○	●	○	●	○	●	○	○
	20		Pearlitic		230	780	○	●	○	●	○	●	○	●	○	●	○	●		
N	21	Aluminum & Magnesium - wrought alloy	Non Heat Treatable		60	210	●		●		●		○		○		○		○	○
	22		Heat Treatable	AH	100	360	●		●		●		○		○		○		○	○
	23	Aluminum & Magnesium - cast alloy ≤12% Si	Non Heat Treatable		75	270	○	●	○	○	○	○	○	○	○	○	○	○	○	○
	24		Heat Treatable	AH	90	320	○	●	○	●	○	●	○	●	○	●	○	●	○	○
	25	Al & Mg - cast alloy >12% Si	Non Heat Treatable		130	460		●		●		●		●		●		●		
	26	Copper & Cu alloys (Brass/Bronze)	Free cutting, Pb > 1%		110	390	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	27		Brass (CuZn, CuSnZn)		90	320	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	28		Bronze (CuSn)		100	360	○	○												
	29	Non-metallic - Thermosetting & fiber-reinforced plastics					○	○	○	○		○		○		○		○		
	30	Non-metallic - Hard rubber, wood etc.																		
S	31	High temp. alloys	Fe based	A	200	680														
	32			AH	280	950														
	33		Ni / Co based	A	250	840														
	34			AH	350	1180														
	35			C	320	1080														
	36	Titanium & Ti alloys	CP Titanium		400 MPa															
	37.1		Alpha alloys		860 MPa															
	37.2		Alpha / Beta alloys	A	960 MPa															
	37.3			AH	1170 MPa															
	37.4		Beta alloys	A	830 MPa															
	37.5			AH	1400 MPa															
H	38.1	Hardened steel		HT	45 HRC															
	38.2			HT	55 HRC															
	39.1			HT	58 HRC															
	39.2			HT	62 HRC															
	40	Cast Iron	Chilled	C	400	1350	○	●	○	●	○	●	○	●	○	●	○	●		
	41			HT	55 HRC															

Condition: **A** (Annealed), **AH** (Age Hardened), **C** (Cast), **HT** (Hardened & Tempered), **QT** (Quenched & Tempered)

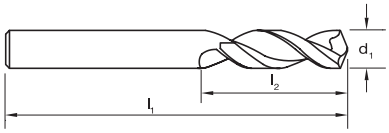
● **Optimal** ○ **Effective**

suttontools

- High performance drill
- Suitable for materials up to 1200N/mm²
- Point geometry ensures high strength
- Parabolic flute design for optimal chip transportation
- TiAlN for longer tool life

Form A Form B

DIN 1897 | 3xd1



	D146	D151
Catalogue Code		
Discount Group	A1004	A1006
Material	HSS Co	HSS Co
Surface Finish	*Brt*	*TiAlN*
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130°	130°
Shank Tolerance	h9	h9

Size Ref.	d_1		l_1	l_2	Point	Item #	Item #
0100	1.0		26	6	Form A	D146 0100	D151 0100
0110	1.1		28	7	Form A	D146 0110	D151 0110
0120	1.2		30	8	Form A	D146 0120	D151 0120
0130	1.3		30	8	Form A	D146 0130	D151 0130
0140	1.4		32	9	Form A	D146 0140	D151 0140
0150	1.5		32	9	Form A	D146 0150	D151 0150
0160	1.6		34	10	Form A	D146 0160	D151 0160
0170	1.7		34	10	Form A	D146 0170	D151 0170
0180	1.8		36	11	Form A	D146 0180	D151 0180
0190	1.9		36	11	Form A	D146 0190	D151 0190
0200	2.0		38	12	Form B	D146 0200	D151 0200
0210	2.1		40	13	Form B	D146 0210	D151 0210
0220	2.2		40	13	Form B	D146 0220	D151 0220
0230	2.3		40	13	Form B	D146 0230	D151 0230
0240	2.4		43	14	Form B	D146 0240	D151 0240
0250	2.5		43	14	Form B	D146 0250	D151 0250
0260	2.6		43	14	Form B	D146 0260	D151 0260
0270	2.7		46	16	Form B	D146 0270	D151 0270
0280	2.8		46	16	Form B	D146 0280	D151 0280
0290	2.9		46	16	Form B	D146 0290	D151 0290
0300	3.0		46	16	Form B	D146 0300	D151 0300
0310	3.1		49	18	Form B	D146 0310	D151 0310
0318	3.18	1/8	49	18	Form B	D146 0318	D151 0318
0320	3.2		49	18	Form B	D146 0320	D151 0320
0330	3.3		49	18	Form B	D146 0330	D151 0330
0340	3.4		52	20	Form B	D146 0340	D151 0340
0350	3.5		52	20	Form B	D146 0350	D151 0350
0357	3.57	9/64	52	20	Form B	D146 0357	D151 0357
0360	3.6		52	20	Form B	D146 0360	D151 0360
0370	3.7		52	20	Form B	D146 0370	D151 0370
0380	3.8		55	22	Form B	D146 0380	D151 0380
0390	3.9		55	22	Form B	D146 0390	D151 0390
0397	3.97	5/32	55	22	Form B	D146 0397	D151 0397
0400	4.0		55	22	Form B	D146 0400	D151 0400
0410	4.1		55	22	Form B	D146 0410	D151 0410
0420	4.2		55	22	Form B	D146 0420	D151 0420
0430	4.3		58	24	Form B	D146 0430	D151 0430
0437	4.37	11/64	58	24	Form B	D146 0437	D151 0437
0440	4.4		58	24	Form B	D146 0440	D151 0440
0450	4.5		58	24	Form B	D146 0450	D151 0450
0460	4.6		58	24	Form B	D146 0460	D151 0460
0470	4.7		58	24	Form B	D146 0470	D151 0470
0476	4.76	3/16	62	26	Form B	D146 0476	D151 0476
0480	4.8		62	26	Form B	D146 0480	D151 0480

Size Ref.	d_1		l_1	l_2	Point	Item #	Item #
0490	4.9		62	26		D146 0490	D151 0490
0500	5.0		62	26		D146 0500	D151 0500
0510	5.1		62	26		D146 0510	D151 0510
0516	5.16	13/64	62	26		D146 0516	D151 0516
0520	5.2		62	26		D146 0520	D151 0520
0530	5.3		62	26		D146 0530	D151 0530
0540	5.4		66	28		D146 0540	D151 0540
0550	5.5		66	28		D146 0550	D151 0550
0556	5.56	7/32	66	28		D146 0556	D151 0556
0560	5.6		66	28		D146 0560	D151 0560
0570	5.7		66	28		D146 0570	D151 0570
0580	5.8		66	28		D146 0580	D151 0580
0590	5.9		66	28		D146 0590	D151 0590
0595	5.95	15/64	66	28		D146 0595	D151 0595
0600	6.0		66	28		D146 0600	D151 0600
0610	6.1		70	31		D146 0610	D151 0610
0620	6.2		70	31		D146 0620	D151 0620
0630	6.3		70	31		D146 0630	D151 0630
0635	6.35	1/4	70	31		D146 0635	D151 0635
0640	6.4		70	31		D146 0640	D151 0640
0650	6.5		70	31		D146 0650	D151 0650
0660	6.6		70	31		D146 0660	D151 0660
0670	6.7		70	31		D146 0670	D151 0670
0676	6.75	17/64	74	34		D146 0676	D151 0676
0680	6.8		74	34		D146 0680	D151 0680
0690	6.9		74	34		D146 0690	D151 0690
0700	7.0		74	34		D146 0700	D151 0700
0710	7.1		74	34		D146 0710	D151 0710
0714	7.14	9/32	74	34		D146 0714	D151 0714
0720	7.2		74	34		D146 0720	D151 0720
0730	7.3		74	34		D146 0730	D151 0730
0740	7.4		74	34		D146 0740	D151 0740
0750	7.5		74	34		D146 0750	D151 0750
0754	7.54	19/64	79	37		D146 0754	D151 0754
0760	7.6		79	37		D146 0760	D151 0760
0770	7.7		79	37		D146 0770	D151 0770
0780	7.8		79	37		D146 0780	D151 0780
0790	7.9		79	37		D146 0790	D151 0790
0794	7.94	5/16	79	37		D146 0794	D151 0794
0800	8.0		79	37		D146 0800	D151 0800
0810	8.1		79	37		D146 0810	D151 0810
0820	8.2		79	37		D146 0820	D151 0820
0830	8.3		79	37		D146 0830	D151 0830
0833	8.33	21/64	79	37		D146 0833	D151 0833

ISO	P												M			K						N						S												H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D146	●	●	●	●	○	●	●	○		○		○	○	○	○	○	○	○	○	○	○	○	●	●	○	○		○	○	○	○															○	
D151	●	●	●	●	●	●	●	●	○	●	○	○	○	○	○	●	●	●	●	●	●	●			●	●	●	○	○	○	○														●	

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metals | S Titanium & Super Alloys | H Hard Materials

● Optimal ○ Effective

suttontools

- High performance drill
- Suitable for materials up to 1200N/mm²
- Point geometry ensures high strength
- Parabolic flute design for optimal chip transportation
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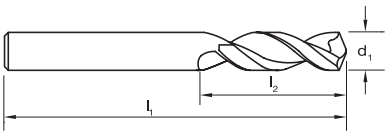
Form A Form B

DIN 1897 | 3xd1



	D146	D151
Catalogue Code		
Discount Group	A1004	A1006
Material	HSS Co	HSS Co
Surface Finish	*Brt*	*TiAlN*
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130°	130°
Shank Tolerance	h9	h9

Size Ref.	d_1	l_1	l_2	Point	Item #	Item #
0840	8.4	79	37		D146 0840	D151 0840
0850	8.5	79	37		D146 0850	D151 0850
0860	8.6	84	40		D146 0860	D151 0860
0870	8.7	84	40		D146 0870	D151 0870
0873	8.73 11/32	84	40		D146 0873	D151 0873
0880	8.8	84	40		D146 0880	D151 0880
0890	8.9	84	40		D146 0890	D151 0890
0900	9.0	84	40		D146 0900	D151 0900
0910	9.1	84	40		D146 0910	D151 0910
0913	9.13 23/64	84	40		D146 0913	D151 0913
0920	9.2	84	40		D146 0920	D151 0920
0930	9.3	84	40		D146 0930	D151 0930
0940	9.4	84	40		D146 0940	D151 0940
0950	9.5	84	40		D146 0950	D151 0950
0953	9.53 3/8	89	43		D146 0953	D151 0953
0960	9.6	89	43		D146 0960	D151 0960
0970	9.7	89	43		D146 0970	D151 0970
0980	9.8	89	43		D146 0980	D151 0980
0990	9.9	89	43		D146 0990	D151 0990
0992	9.92 25/64	89	43		D146 0992	D151 0992
1000	10.0	89	43		D146 1000	D151 1000
1010	10.1	89	43		D146 1010	•
1020	10.2	89	43		D146 1020	D151 1020
1030	10.3	89	43		D146 1030	•
1032	10.32 13/32	89	43		D146 1032	D151 1032
1040	10.4	89	43		D146 1040	•
1050	10.5	89	43		D146 1050	D151 1050
1060	10.6	95	47		D146 1060	•
1070	10.7	95	47		D146 1070	•
1072	10.72 27/64	95	47		D146 1072	D151 1072
1080	10.8	95	47		D146 1080	D151 1080
1090	10.9	95	47		D146 1090	•
1100	11.0	95	47		D146 1100	D151 1100
1110	11.1	95	47		D146 1110	•
1111	11.11 7/16	95	47		D146 1111	D151 1111
1120	11.2	95	47		D146 1120	•
1130	11.3	95	47		D146 1130	•
1140	11.4	95	47		D146 1140	•
1150	11.5	95	47		D146 1150	D151 1150
1151	11.51 29/64	95	47		D146 1151	D151 1151
1160	11.6	95	47		D146 1160	•
1170	11.7	95	47		D146 1170	•
1180	11.8	95	47		D146 1180	D151 1180
1190	11.9	102	51		D146 1190	•
1191	11.91 15/32	102	51		D146 1191	D151 1191
1200	12.0	102	51		D146 1200	D151 1200
1210	12.1	102	51		D146 1210	•
1220	12.2	102	51		D146 1220	D151 1220
1230	12.3	102	51		D146 1230	•
1231	12.3 31/64	102	51		D146 1231	D151 1231
1240	12.4	102	51		D146 1240	•
1250	12.5	102	51		D146 1250	D151 1250
1260	12.6	102	51		D146 1260	•
1269	12.7 1/2	102	51		D146 1269	D151 1269
1270	12.7	102	51		D146 1270	D151 1270
1280	12.8	102	51		D146 1280	•
1290	12.9	102	51		D146 1290	•
1300	13.0	102	51		D146 1300	D151 1300
1350	13.5	107	54		D146 1350	D151 1350
1400	14.0	107	54		D146 1400	D151 1400
1450	14.5	111	56		D146 1450	D151 1450
1500	15.0	111	56		D146 1500	D151 1500
1550	15.5	115	58		D146 1550	D151 1550
1600	16.0	115	58		D146 1600	D151 1600
1650	16.5	119	60		D146 1650	D151 1650
1700	17.0	119	60		D146 1700	D151 1700
1750	17.5	123	62		D146 1750	D151 1750
1800	18.0	123	62		D146 1800	D151 1800
1850	18.5	127	64		D146 1850	D151 1850
1900	19.0	127	64		D146 1900	D151 1900
1950	19.5	131	66		D146 1950	D151 1950
2000	20.0	131	66		D146 2000	D151 2000

ISO	P													M			K						N									S														H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D146	●	●	●	●	○	●	●	○		○		○	○	○	○	○	○	○	○	○	○	○	●	●	○	○		○	○	○	○																	○	
D151	●	●	●	●	●	●	●	●	○	●	○	○	○	○	○	●	●	●	●	●	●	●			●	●	●	○	○	○	○																	●	

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metals | S Titanium & Super Alloys | H Hard Materials

● Optimal ○ Effective

• Available on request as special manufacture. Subject to lead time.

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- High performance drill
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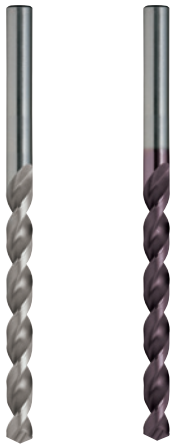
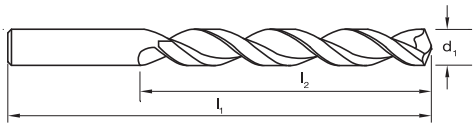
- TiAlN for longer tool life

Form A Form B

DIN 338 | 5xd1





	D158	D163
Catalogue Code		
Discount Group	A0404	A0418
Material	HSS Co	HSS Co
Surface Finish	Brt	TiAlN
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130°	130°
Shank Tolerance	h9	h9

Size Ref.	d1		l1	l2	Point	Item #	Item #
0100	1.0		34	13	Form A	D158 0100	D163 0100
0110	1.1		36	15	Form A	D158 0110	D163 0110
0120	1.2		38	17	Form A	D158 0120	D163 0120
0130	1.3		38	17	Form A	D158 0130	D163 0130
0140	1.4		40	19	Form A	D158 0140	D163 0140
0150	1.5		40	19	Form A	D158 0150	D163 0150
0159	1.59	1/16	43	21	Form A	•	•
0160	1.6		43	21	Form A	D158 0160	D163 0160
0170	1.7		43	21	Form A	D158 0170	D163 0170
0180	1.8		46	23	Form A	D158 0180	D163 0180
0190	1.9		46	23	Form A	D158 0190	D163 0190
0198	1.98	5/64	49	25	Form B	•	•
0200	2.0		49	25	Form B	D158 0200	D163 0200
0210	2.1		49	25	Form B	D158 0210	D163 0210
0220	2.2		53	28	Form B	D158 0220	D163 0220
0230	2.3		53	28	Form B	D158 0230	D163 0230
0238	2.38	3/32	57	31	Form B	•	•
0240	2.4		57	31	Form B	D158 0240	D163 0240
0250	2.5		57	31	Form B	D158 0250	D163 0250
0260	2.6		57	31	Form B	D158 0260	D163 0260
0270	2.7		61	34	Form B	D158 0270	D163 0270
0278	2.78	7/64	61	34	Form B	•	•
0280	2.8		61	34	Form B	D158 0280	D163 0280
0290	2.9		61	34	Form B	D158 0290	D163 0290
0300	3.0		61	33	Form B	D158 0300	D163 0300
0310	3.1		65	36	Form B	D158 0310	D163 0310
0318	3.18	1/8	65	36	Form B	D158 0318	D163 0318
0320	3.2		65	36	Form B	D158 0320	D163 0320
0330	3.3		65	36	Form B	D158 0330	D163 0330
0340	3.4		70	39	Form B	D158 0340	D163 0340
0350	3.5		70	39	Form B	D158 0350	D163 0350
0357	3.57	9/64	70	39	Form B	D158 0357	D163 0357
0360	3.6		70	39	Form B	D158 0360	D163 0360
0370	3.7		70	39	Form B	D158 0370	D163 0370
0380	3.8		75	43	Form B	D158 0380	D163 0380
0390	3.9		75	43	Form B	D158 0390	D163 0390
0397	3.97	5/32	75	43	Form B	D158 0397	D163 0397
0400	4.0		75	43	Form B	D158 0400	D163 0400
0410	4.1		75	43	Form B	D158 0410	D163 0410
0420	4.2		75	43	Form B	D158 0420	D163 0420

Size Ref.	d1		l1	l2	Point	Item #	Item #
0430	4.3		80	47	Form B	D158 0430	D163 0430
0437	4.37	11/64	80	47	Form B	D158 0437	D163 0437
0440	4.4		80	47	Form B	D158 0440	D163 0440
0450	4.5		80	47	Form B	D158 0450	D163 0450
0460	4.6		80	47		D158 0460	D163 0460
0470	4.7		80	47		D158 0470	D163 0470
0476	4.76	3/16	80	47		D158 0476	D163 0476
0480	4.8		86	52		D158 0480	D163 0480
0490	4.9		86	52		D158 0490	D163 0490
0500	5.0		86	52		D158 0500	D163 0500
0510	5.1		86	52		D158 0510	D163 0510
0516	5.16	13/64	86	52		D158 0516	D163 0516
0520	5.2		86	52		D158 0520	D163 0520
0530	5.3		86	52		D158 0530	D163 0530
0540	5.4		93	57		D158 0540	D163 0540
0550	5.5		93	57		D158 0550	D163 0550
0556	5.56	7/32	93	57		D158 0556	D163 0556
0560	5.6		93	57		D158 0560	D163 0560
0570	5.7		93	57		D158 0570	D163 0570
0580	5.8		93	57		D158 0580	D163 0580
0590	5.9		93	57		D158 0590	D163 0590
0595	5.95	15/64	93	57		D158 0595	D163 0595
0600	6.0		93	57		D158 0600	D163 0600
0610	6.1		101	63		D158 0610	D163 0610
0620	6.2		101	63		D158 0620	D163 0620
0630	6.3		101	63		D158 0630	D163 0630
0635	6.35	1/4	101	63		D158 0635	D163 0635
0640	6.4		101	63		D158 0640	D163 0640
0650	6.5		101	63		D158 0650	D163 0650
0660	6.6		101	63		D158 0660	D163 0660
0670	6.7		101	63		D158 0670	D163 0670
0676	6.75	17/64	109	69		D158 0676	D163 0676
0680	6.8		109	69		D158 0680	D163 0680
0690	6.9		109	69		D158 0690	D163 0690
0700	7.0		109	69		D158 0700	D163 0700
0710	7.1		109	69		D158 0710	D163 0710
0714	7.14	9/32	109	69		D158 0714	D163 0714
0720	7.2		109	69		D158 0720	D163 0720
0730	7.3		109	69		D158 0730	D163 0730
0740	7.4		109	69		D158 0740	D163 0740

ISO	P												M			K						N							S												H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D158	●	●	●	●	○	●	●	○		○				○			○	○	○	○	○	○	●	●	○	○		○	○		○																○	
D163	●	●	●	●	●	●	●	●	○	●	○	○	○	○		○	●	●	●	●	●	●			○	●	●	○	○		○																●	

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metals | S Titanium & Super Alloys | H Hard Materials

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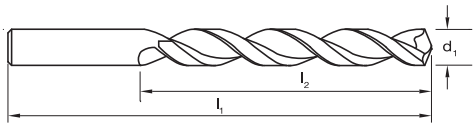
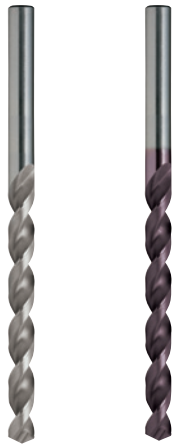
- TiAlN for longer tool life

Form A Form B

DIN 338 | 5xd1





	D158	D163
Catalogue Code		
Discount Group	A0404	A0418
Material	HSS Co	HSS Co
Surface Finish	*Brt*	*TiAlN*
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130°	130°
Shank Tolerance	h9	h9

Size Ref.	d_1		l_1	l_2	Point	Item #	Item #
0750	7.5		109	69		D158 0750	D163 0750
0754	7.54	19/64	117	75		D158 0754	D163 0754
0760	7.6		117	75		D158 0760	D163 0760
0770	7.7		117	75		D158 0770	D163 0770
0780	7.8		117	75		D158 0780	D163 0780
0790	7.9		117	75		D158 0790	D163 0790
0794	7.94	5/16	117	75		D158 0794	D163 0794
0800	8.0		117	75		D158 0800	D163 0800
0810	8.1		117	75		D158 0810	D163 0810
0820	8.2		117	75		D158 0820	D163 0820
0830	8.3		117	75		D158 0830	D163 0830
0833	8.33	21/64	117	75		D158 0833	D163 0833
0840	8.4		117	75		D158 0840	D163 0840
0850	8.5		117	75		D158 0850	D163 0850
0860	8.6		125	81		D158 0860	D163 0860
0870	8.7		125	81		D158 0870	D163 0870
0873	8.73	11/32	125	81		D158 0873	D163 0873
0880	8.8		125	81		D158 0880	D163 0880
0890	8.9		125	81		D158 0890	D163 0890
0900	9.0		125	81		D158 0900	D163 0900
0910	9.1		125	81		D158 0910	D163 0910
0913	9.13	23/64	125	81		D158 0913	D163 0913
0920	9.2		125	81		D158 0920	D163 0920
0930	9.3		125	81		D158 0930	D163 0930
0940	9.4		125	81		D158 0940	D163 0940
0950	9.5		125	81		D158 0950	D163 0950
0953	9.52	3/8	133	87		D158 0953	D163 0953
0960	9.6		133	87		D158 0960	D163 0960
0970	9.7		133	87		D158 0970	D163 0970
0980	9.8		133	87		D158 0980	D163 0980
0990	9.9		133	87		D158 0990	D163 0990
0992	9.92	25/64	133	87		D158 0992	D163 0992
1000	10.0		133	87		D158 1000	D163 1000
1010	10.1		133	87		D158 1010	•
1020	10.2		133	87		D158 1020	D163 1020
1030	10.3		133	87		D158 1030	•
1032	10.32	13/32	133	87		D158 1032	D163 1032
1040	10.4		133	87		D158 1040	•
1050	10.5		133	87		D158 1050	D163 1050
1060	10.6		133	87		D158 1060	•
1070	10.7		142	94		D158 1070	•
1072	10.72	27/64	142	94		D158 1072	D163 1072
1080	10.8		142	94		D158 1080	D163 1080
1090	10.9		142	94		D158 1090	•

Size Ref.	d_1		l_1	l_2	Point	Item #	Item #
1100	11.0		142	94		D158 1100	D163 1100
1110	11.1		142	94		D158 1110	D163 1110
1111	11.11	7/16	142	94		D158 1111	D163 1111
1120	11.2		142	94		D158 1120	•
1130	11.3		142	94		D158 1130	•
1140	11.4		142	94		D158 1140	•
1150	11.5		142	94		D158 1150	D163 1150
1151	11.51	29/64	142	94		D158 1151	D163 1151
1160	11.6		142	94		D158 1160	•
1170	11.7		142	94		D158 1170	•
1180	11.8		142	94		D158 1180	D163 1180
1190	11.9		151	101		D158 1190	•
1191	11.91	15/32	151	101		D158 1191	D163 1191
1200	12.0		151	101		D158 1200	D163 1200
1210	12.1		151	101		D158 1210	•
1220	12.2		151	101		D158 1220	D163 1220
1230	12.3		151	101		D158 1230	•
1231	12.3	31/64	151	101		D158 1231	D163 1231
1240	12.4		151	101		D158 1240	•
1250	12.5		151	101		D158 1250	D163 1250
1260	12.6		151	101		D158 1260	•
1270	12.7		151	101		D158 1270	D163 1270
1269	12.7	1/2	151	101		D158 1269	D163 1269
1280	12.8		151	101		D158 1280	•
1290	12.9		151	101		D158 1290	•
1300	13.0		151	101		D158 1300	D163 1300
1350	13.5		160	108		D158 1350	D163 1350
1400	14.0		160	108		D158 1400	D163 1400
1450	14.5		169	114		D158 1450	D163 1450
1500	15.0		169	114		D158 1500	D163 1500
1550	15.5		178	120		D158 1550	D163 1550
1600	16.0		178	120		D158 1600	D163 1600

ISO	P													M			K							N									S														H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D158	●	●	●	●	○	●	●	○		○				○			○	○	○	○	○	○	●	●	○	○		○	○		○																	○	
D163	●	●	●	●	●	●	●	●	○	●	○	○	○	○		○	●	●	●	●	●	●			○	●	●	○	○		○																	●	

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metals | S Titanium & Super Alloys | H Hard Materials

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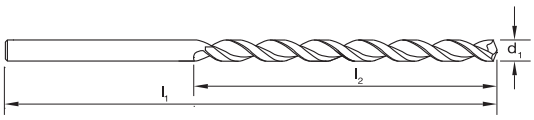
- Parabolic flute design for optimal chip transportation
- Less pecking required over standard drills
- TiAlN for longer tool life

Form A Form B

DIN 340 | 8xd1



	D170	D171
Catalogue Code		
Discount Group	A0502	A0508
Material	HSS Co	HSS Co
Surface Finish	*Brt*	*TiAlN*
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130°	130°
Shank Tolerance	h9	h9

Size Ref.	d_1	l_1	l_2	Point	Item #	Item #
0100†	1.0	56	33	Form A	D170 0100	D171 0100
0110†	1.1	60	37	Form A	D170 0110	D171 0110
0120†	1.2	65	41	Form A	D170 0120	D171 0120
0130†	1.3	65	41	Form A	D170 0130	D171 0130
0140†	1.4	70	45	Form A	D170 0140	D171 0140
0150†	1.5	70	45	Form A	D170 0150	D171 0150
0160†	1.6	76	50	Form A	D170 0160	D171 0160
0170†	1.7	76	50	Form A	D170 0170	D171 0170
0180†	1.8	80	53	Form A	D170 0180	D171 0180
0190†	1.9	80	53	Form A	D170 0190	D171 0190
0200†	2.0	85	56	Form B	D170 0200	D171 0200
0210†	2.1	85	56	Form B	D170 0210	D171 0210
0220†	2.2	90	59	Form B	D170 0220	D171 0220
0230†	2.3	90	59	Form B	D170 0230	D171 0230
0240†	2.4	95	62	Form B	D170 0240	D171 0240
0250†	2.5	95	62	Form B	D170 0250	D171 0250
0260†	2.6	95	62	Form B	D170 0260	D171 0260
0270†	2.7	100	66	Form B	D170 0270	D171 0270
0280†	2.8	100	66	Form B	D170 0280	D171 0280
0290†	2.9	100	66	Form B	D170 0290	D171 0290
0300	3.0	100	66	Form B	D170 0300	D171 0300
0310	3.1	106	69	Form B	D170 0310	D171 0310
0320	3.2	106	69	Form B	D170 0320	D171 0320
0330	3.3	106	69	Form B	D170 0330	D171 0330
0340	3.4	112	73	Form B	D170 0340	D171 0340
0350	3.5	112	73	Form B	D170 0350	D171 0350
0360	3.6	112	73	Form B	D170 0360	D171 0360
0370	3.7	112	73	Form B	D170 0370	D171 0370
0380	3.8	119	78	Form B	D170 0380	D171 0380
0390	3.9	119	78	Form B	D170 0390	D171 0390
0400	4.0	119	78	Form B	D170 0400	D171 0400
0410	4.1	119	78	Form B	D170 0410	D171 0410
0420	4.2	119	78	Form B	D170 0420	D171 0420
0430	4.3	126	82	Form B	D170 0430	D171 0430
0440	4.4	126	82	Form B	D170 0440	D171 0440
0450	4.5	126	82	Form B	D170 0450	D171 0450
0460	4.6	126	82	Form B	D170 0460	D171 0460
0470	4.7	126	82	Form B	D170 0470	D171 0470
0480	4.8	132	87	Form B	D170 0480	D171 0480
0490	4.9	132	87	Form B	D170 0490	D171 0490
0500	5.0	132	87	Form B	D170 0500	D171 0500
0510	5.1	132	87	Form B	D170 0510	D171 0510
0520	5.2	132	87	Form B	D170 0520	D171 0520
0530	5.3	132	87	Form B	D170 0530	D171 0530
0540	5.4	139	91	Form B	D170 0540	D171 0540
0550	5.5	139	91	Form B	D170 0550	D171 0550
0560	5.6	139	91	Form B	D170 0560	D171 0560
0570	5.7	139	91	Form B	D170 0570	D171 0570

Size Ref.	d_1	l_1	l_2	Point	Item #	Item #
0580	5.8	139	91		D170 0580	D171 0580
0590	5.9	139	91		D170 0590	D171 0590
0600	6.0	139	91		D170 0600	D171 0600
0610	6.1	148	97		D170 0610	D171 0610
0620	6.2	148	97		D170 0620	D171 0620
0630	6.3	148	97		D170 0630	D171 0630
0640	6.4	148	97		D170 0640	D171 0640
0650	6.5	148	97		D170 0650	D171 0650
0660	6.6	148	97		D170 0660	D171 0660
0670	6.7	148	97		D170 0670	D171 0670
0680	6.8	156	102		D170 0680	D171 0680
0690	6.9	156	102		D170 0690	D171 0690
0700	7.0	156	102		D170 0700	D171 0700
0710	7.1	156	102		D170 0710	D171 0710
0720	7.2	156	102		D170 0720	D171 0720
0730	7.3	156	102		D170 0730	D171 0730
0740	7.4	156	102		D170 0740	D171 0740
0750	7.5	156	102		D170 0750	D171 0750
0760	7.6	165	109		D170 0760	D171 0760
0770	7.7	165	109		D170 0770	D171 0770
0780	7.8	165	109		D170 0780	D171 0780
0790	7.9	165	109		D170 0790	D171 0790
0800	8.0	165	109		D170 0800	D171 0800
0810	8.1	165	109		D170 0810	D171 0810
0820	8.2	165	109		D170 0820	D171 0820
0830	8.3	165	109		D170 0830	D171 0830
0840	8.4	165	109		D170 0840	D171 0840
0850	8.5	165	109		D170 0850	D171 0850
0860	8.6	175	115		D170 0860	D171 0860
0870	8.7	175	115		D170 0870	D171 0870
0880	8.8	175	115		D170 0880	D171 0880
0890	8.9	175	115		D170 0890	D171 0890
0900	9.0	175	115		D170 0900	D171 0900
0910	9.1	175	115		D170 0910	D171 0910
0920	9.2	175	115		D170 0920	D171 0920
0930	9.3	175	115		D170 0930	D171 0930
0940	9.4	175	115		D170 0940	D171 0940
0950	9.5	175	115		D170 0950	D171 0950
0980	9.8	184	121		D170 0980	D171 0980
1000	10.0	184	121		D170 1000	D171 1000
1020	10.2	184	121		D170 1020	D171 1020
1050	10.5	184	121		D170 1050	D171 1050
1100	11.0	195	128		D170 1100	D171 1100
1150	11.5	195	128		D170 1150	D171 1150
1200	12.0	205	134		D170 1200	D171 1200
1250	12.5	205	134		D170 1250	D171 1250
1300	13.0	205	134		D170 1300	D171 1300

ISO	P												M			K						N								S												H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D170	●	●	●	●	○	●	●	○		○				○			○	○	○	○	○	○	●	●	○	○		○	○																			○	
D171	●	●	●	●	●	●	●	●	○	●	○	○	○	○		○	●	●	●	●	●	●			○	●	●	○	○		○																	●	

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metals S Titanium & Super Alloys H Hard Materials

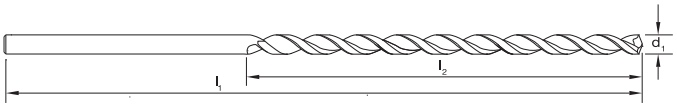
● Optimal ○ Effective

† Sizes <3.0 point type: 130° 4 Facet

suttontools

- High performance drill
- Suitable for materials up to 1200N/mm²
- Point geometry ensures high strength
- Parabolic flute design for optimal chip transportation
- Less pecking required over standard drills
- TiAlN for longer tool life

DIN 1869-1 | 10xd1 | 12xd1 | 14xd1



Catalogue Code		
Discount Group	A0502	A0508
Material	HSS	HSS Co
Surface Finish	*Ni + Blu*	*TiAlN*
Colour Ring & Application	NH	NH
Geometry	R40	R40
Point Type	130° Form B	130° Form B
Shank Tolerance	h9	h9

Size Ref.	d_1	l_1	l_2	Item #	Item #
	DHXL-1	10 x D		D191*	D194
0200	2.0	125	85	D191 0200	D194 0200
0250	2.5	135	90	D191 0250	D194 0250
0300	3.0	155	105	D191 0300	D194 0300
0350	3.5	165	115	D191 0350	D194 0350
0400	4.0	175	120	D191 0400	D194 0400
0450	4.5	185	125	D191 0450	D194 0450
0500	5.0	195	135	D191 0500	D194 0500
0550	5.5	205	140	D191 0550	D194 0550
0600	6.0	205	140	D191 0600	D194 0600
0650	6.5	215	150	D191 0650	D194 0650
0700	7.0	225	155	D191 0700	D194 0700
0750	7.5	225	155	D191 0750	D194 0750
0800	8.0	240	165	D191 0800	D194 0800
0850	8.5	240	165	D191 0850	D194 0850
0900	9.0	250	175	D191 0900	D194 0900
0950	9.5	250	175	D191 0950	D194 0950
1000	10.0	265	185	D191 1000	D194 1000
	DHXL-2	12 x D		D192*	D195
0300	3.0	200	135	D192 0300	D195 0300
0350	3.5	210	145	D192 0350	D195 0350
0400	4.0	220	150	D192 0400	D195 0400
0450	4.5	235	160	D192 0450	D195 0450
0500	5.0	245	170	D192 0500	D195 0500
0550	5.5	260	180	D192 0550	D195 0550
0600	6.0	260	180	D192 0600	D195 0600
0650	6.5	275	190	D192 0650	D195 0650
0700	7.0	290	200	D192 0700	D195 0700
0750	7.5	290	200	D192 0750	D195 0750
0800	8.0	305	210	D192 0800	D195 0800
0850	8.5	305	210	D192 0850	D195 0850
0900	9.0	320	220	D192 0900	D195 0900
0950	9.5	320	220	D192 0950	D195 0950
1000	10.0	340	235	D192 1000	D195 1000
	DHXL-3	14 x D		D193*	D196
0350	3.5	265	180	D193 0350	D196 0350
0400	4.0	280	190	D193 0400	D196 0400
0450	4.5	295	200	D193 0450	D196 0450
0500	5.0	315	210	D193 0500	D196 0500
0550	5.5	330	225	D193 0550	D196 0550
0600	6.0	330	225	D193 0600	D196 0600
0650	6.5	350	235	D193 0650	D196 0650
0700	7.0	370	250	D193 0700	D196 0700
0750	7.5	370	250	D193 0750	D196 0750
0800	8.0	390	265	D193 0800	D196 0800
0850	8.5	390	265	D193 0850	D196 0850
0900	9.0	410	280	D193 0900	D196 0900
0950	9.5	410	280	D193 0950	D196 0950
1000	10.0	430	295	D193 1000	D196 1000

ISO	P													M			K							N								S												H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D191	●	●	●	●	○	●	○	○		○				○		○	○	○	○	○	○	○	○	○	○	○		○	○																		○	
D194	●	●	●	●	●	●	●	●	○	●	○	○	○	○		○	●	●	●	●	●	●			○	●	●	○	○		○																	●	

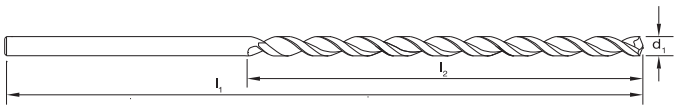
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metals | S Titanium & Super Alloys | H Hard Materials

● Optimal ○ Effective

* Sizes over 10mm to 13mm are available for D191, D192 & D193 series, please refer to main catalogue for details

suttontools

- Suitable for materials up to 700N/mm²
- Point geometry ensures high strength
- Parabolic flute design for optimal chip transportation
- Less pecking required over standard drills



Catalogue Code	
Discount Group	A0502
Material	HSS
Surface Finish	Brt
Colour Ring & Application	N
Geometry	R40
Point Type	130° Form B
Shank Tolerance	h9

Size Ref.	d_1		l_1	l_2	Item #
	8" Overall Length				**D197**
0318	3.18	**1/8**	200	140	D197 0318
0476	4.76	**3/16**	200	140	D197 0476
0635	6.35	**1/4**	200	140	D197 0635
0794	7.94	**5/16**	200	140	D197 0794
0953	9.53	**3/8**	200	140	D197 0953
	10" Overall Length				**D198**
0476	4.76	**3/16**	250	190	D198 0476
0635	6.35	**1/4**	250	190	D198 0635
0794	7.94	**5/16**	250	190	D198 0794
0953	9.53	**3/8**	250	190	D198 0953
1270	12.70	**1/2**	250	190	D198 1270
	12" Overall Length				**D199**
0635	6.35	**1/4**	300	230	D199 0635
0794	7.94	**5/16**	300	230	D199 0794
0953	9.53	**3/8**	300	230	D199 0953
1111	11.11	**7/16**	300	230	D199 1111
1270	12.70	**1/2**	300	230	D199 1270

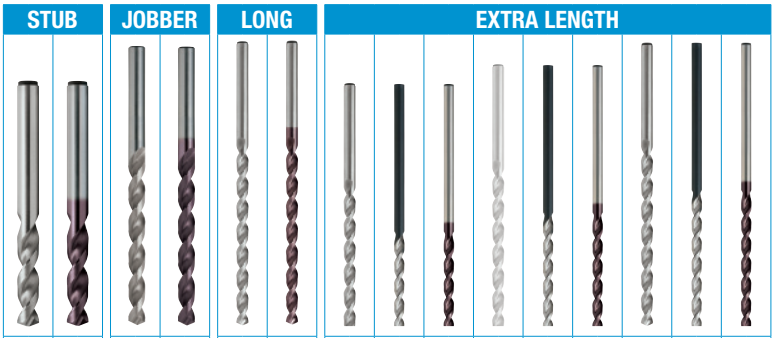
ISO	P													M			K						N								S														H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
D197	●	●	○	○		●	○							○		○	○		○		○		○	○	○	○		○	○																						

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metals S Titanium & Super Alloys H Hard Materials

● Optimal ○ Effective

suttontools

ISO	VDI	Material Group	Sutton	
P	A	Steel	N	UNI
M	R	Stainless Steel	VA	
K	F	Cast Iron	GG	
N	N	Non-Ferrous Metals, Aluminiums & Coppers	Al W	
S	S	Titaniums & Super Alloys	Ti	Ni
H	H	Hard Materials (≥ 45 HRC)	H	



	STUB		JOBBER		LONG		EXTRA LENGTH								
Catalogue Code	D146	D151	D158	D163	D170	D171	D197	D191	D194	D198	D192	D195	D199	D193	D196
Material	HSS Co		HSS Co		HSS Co		HSS		HSS Co	HSS		HSS Co	HSS	HSS	HSS Co
Surface Finish	Brt	TiAlN	Brt	TiAlN	Brt	TiAlN	Brt	Ni+Blu	TiAlN	Brt	Ni+Blu	TiAlN	Brt	Ni+Blu	TiAlN
Sutton Designation	NH		NH		NH		N	NH		N	NH		N	NH	
Geometry	R40		R40		R40		R40							R40	
Drilling Depth	≤3xØ		≤5xØ		≤7xØ		≤10xØ			≤12xØ			≤14xØ	≤14xØ	

ISO	VDI 3323	Material		Condition	HB	N/mm²	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #	Vc	Feed #
P	1	Steel - Non-alloy, cast & free cutting	~ 0.15 %C	A	125	440	**20**	**5**	**40**	**6**	**20**	**5**	**24**	**5**	**25**	**5**	**30**	**5**	**21**	**5**	**21**	**5**	**25**	**5**	**16**	**5**	**16**	**5**	**20**	**5**	**16**	**5**	**16**	**5**	**20**	**5**				
	2		~ 0.45 %C	A	190	640	**17**	**5**	**30**	**6**	**17**	**5**	**20**	**5**	**13**	**5**	**16**	**5**	**11**	**5**	**11**	**5**	**13**	**5**	**8**	**5**	**8**	**5**	**10**	**5**	**8**	**5**	**8**	**5**	**10**	**5**				
	3			QT	250	840	**12**	**5**	**30**	**6**	**12**	**5**	**20**	**5**	**13**	**5**	**16**	**5**	11	5	**11**	**5**	**13**	**5**	8	5	**8**	**5**	**10**	**5**	8	5	**8**	**5**	**10**	**5**				
	4		~ 0.75 %C	A	270	910	**12**	**5**	**30**	**6**	**12**	**5**	**20**	**5**	**13**	**5**	**16**	**5**	11	5	**11**	**5**	**13**	**5**	8	5	**8**	**5**	**10**	**5**	8	5	**8**	**5**	**10**	**5**				
	5			QT	300	1010	10	4	**15**	**4**	10	4	**12**	**4**	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**				
	6	Steel - Low alloy & cast < 5% of alloying elements		A	180	610	**12**	**5**	**30**	**6**	**12**	**5**	**20**	**5**	**13**	**5**	**16**	**5**	**11**	**5**	**11**	**5**	**13**	**5**	**8**	**5**	**8**	**5**	**10**	**5**	**8**	**5**	**8**	**5**	**10**	**5**				
	7			QT	275	930	**12**	**4**	**20**	**5**	**12**	**4**	**20**	**4**	**13**	**4**	**16**	**4**	11	4	11	4	**13**	**4**	8	4	8	4	**10**	**4**	8	4	8	4	**10**	**4**				
	8			QT	300	1010	10	4	**15**	**4**	10	4	**12**	**4**	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**				
	9			QT	350	1180	-	-	12	4	-	-	10	4	-	-	8	4	-	-	-	-	8	4	-	-	-	-	10	4	-	-	-	-	10	4				
	10	Steel - High alloy, cast & tool		A	200	680	10	4	**15**	**4**	10	4	**12**	**4**	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**	-	-	8	4	**10**	**4**				
	11			HT	325	1100	-	-	12	4	-	-	10	4	-	-	8	4	-	-	-	-	8	4	-	-	-	-	10	4	-	-	-	-	10	4				
	12	Steel - Corrosion resistant & cast	Ferritic / Martensitic	A	200	680	11	4	20	4	-	-	12	4	-	-	10	4	-	-	-	-	10	4	-	-	-	-	10	4	-	-	-	-	10	4				
	13		Martensitic	QT	240	810	8	4	12	4	-	-	10	4	-	-	8	4	-	-	-	-	8	4	-	-	-	-	10	4	-	-	-	-	10	4				
M	14.1	Stainless Steel	Austenitic	AH	180	610	10	4	20	5	10	4	12	4	8	4	10	4	8	4	8	4	10	4	8	4	8	4	10	4	8	4	8	4	10	4				
	14.2		Duplex		250	840	7	4	15	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	14.3		Precipitation Hardening		250	840	11	4	**20**	**4**	-	-	12	4	-	-	10	4	8	4	8	4	10	4	8	4	8	4	10	4	8	4	8	4	10	4				
K	15	Cast Iron - Grey (GG)	Ferritic / Pearlitic		180	610	20	6	**30**	**6**	20	6	**24**	**6**	16	6	**19**	**6**	12	6	12	6	**15**	**6**	10	6	10	6	**12**	**6**	10	6	10	6	**12**	**6**				
	16		Pearlitic		260	880	15	5	**25**	**6**	20	5	**20**	**5**	13	5	**16**	**5**	-	-	11	5	**13**	**5**	-	-	8	5	**10**	**5**	-	-	8	5	**10**	**5**				
	17	Cast Iron - Nodular (GGG)	Ferritic		160	570	18	6	**25**	**6**	20	6	**20**	**6**	13	6	**16**	**6**	11	6	11	6	**13**	**6**	8	6	8	6	**10**	**6**	8	6	8	6	**10**	**6**				
	18		Pearlitic		250	840	18	6	**25**	**6**	20	6	**20**	**6**	13	6	**16**	**6**	-	-	11	6	**13**	**6**	-	-	8	6	**10**	**6**	-	-	8	6	**10**	**6**				
	19	Cast Iron - Malleable	Ferritic		130	460	18	6	**25**	**6**	20	6	**20**	**6**	13	6	**16**	**6**	11	6	11	6	**13**	**6**	8	6	8	6	**10**	**6**	8	6	8	6	**10**	**6**				
	20		Pearlitic		230	780	18	6	**25**	**6**	20	6	**20**	**6**	13	6	**16**	**6**	-	-	11	6	**13**	**6**	-	-	8	6	**10**	**6**	-	-	8	6	**10**	**6**				
N	21	Aluminum & Magnesium - wrought alloy	Non Heat Treatable		60	210	**42**	**6**	-	-	**48**	**6**	-	-	**41**	**6**	-	-	26	6	26	6	-	-	21	6	21	6	-	-	21	6	21	6	-	-				
	22		Heat Treatable	AH	100	360	**42**	**6**	-	-	**48**	**6**	-	-	**41**	**6**	-	-	26	6	26	6	-	-	21	6	21	6	-	-	21	6	21	6	-	-				
	23	Aluminum & Magnesium - cast alloy ≤12% Si	Non Heat Treatable		75	270	28	5	**40**	**5**	32	5	32	5	22	5	26	5	16	5	16	5	20	5	13	5	13	5	16	5	13	5	13	5	16	5				
	24		Heat Treatable	AH	90	320	28	5	**40**	**5**	32	5	**32**	**5**	22	5	**26**	**5**	16	5	16	5	**20**	**5**	13	5	13	5	**16**	**5**	13	5	13	5	**16**	**5**				
	25	Al & Mg - cast alloy >12% Si	Non Heat Treatable		130	460	-	-	**30**	**7**	-	-	**25**	**6**	-	-	**18**	**5**	-	-	-	-	**18**	**5**	-	-	-	-	**16**	**5**	-	-	-	-	**16**	**5**				
	26	Copper & Cu alloys (Brass/Bronze)	Free cutting, Pb > 1%		110	390	25	5	60	5	48	5	48	5	31	5	38	5	26	5	26	5	31	5	21	5	21	5	25	5	21	5	21	5	25	5				
	27		Brass (CuZn, CuSnZn)		90	320	28	5	40	5	32	5	32	5	22	5	26	5	16	5	16	5	20	5	13	5	13	5	16	5	13	5	13	5	16	5				
	28		Bronze (CuSn)		100	360	30	5	30	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	29	Non-metallic - Thermosetting & fiber-reinforced plastics					50	4	50	4	50	4	50	4	-	-	40	4	-	-	-	-	40	4	-	-	-	-	40	4	-	-	-	-	40	4				
	30	Non-metallic - Hard rubber, wood etc.					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
S	31	High temp. alloys	Fe based	A	200	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	32			AH	280	950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	33		Ni / Co based	A	250	840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	34			AH	350	1180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	35			C	320	1080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	36	Titanium & Ti alloys	CP Titanium		400 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	37.1		Alpha alloys		860 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	37.2		Alpha / Beta alloys	A	960 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	37.3			AH	1170 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	37.4		Beta alloys	A	830 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	37.5			AH	1400 MPa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
H	38.1	Hardened steel		HT	45 HRC		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	38.2			HT	55 HRC		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	39.1			HT	58 HRC		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	39.2			HT	62 HRC		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	40	Cast Iron	Chilled	C	400	1350	15	5	**25**	**6**	20	5	**20**	**5**	13	5	**16**	**5**	-	-	11	5	**13**	**5**	-	-	8	5	**10**	**5**	-	-	8	5	**10**	**5**				
	41			HT	55 HRC		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

Condition: **A** (Annealed), **AH** (Age Hardened), **C** (Cast), **HT** (Hardened & Tempered), **QT** (Quenched & Tempered)
Bold = Optimal | Regular = Effective

Ø	1	2	3	4	5	6	7	8	9	10
2.0	0.020	0.025	0.030	0.040	0.050	0.060	0.075	0.095	0.120	0.15
3.0	0.030	0.035	0.045	0.055	0.070	0.090	0.110	0.135	0.17	0.21
4.0	0.040	0.045	0.060	0.075	0.090	0.115	0.140	0.18	0.22	0.27
5.0	0.045	0.055	0.070	0.090	0.110	0.135	0.17	0.21	0.26	0.32
6.0	0.055	0.065	0.080	0.100	0.125	0.16	0.19	0.24	0.30	0.37
8.0	0.070	0.085	0.105	0.130	0.16	0.20	0.25	0.31	0.38	0.47
10.0	0.085	0.105	0.125	0.16	0.19	0.24	0.30	0.37	0.46	0.56
12.0	0.095	0.120	0.15	0.18	0.23	0.28	0.34	0.42	0.52	0.64
16.0	0.125	0.15	0.19	0.23	0.29	0.36	0.44	0.54	0.66	0.82
20.0	0.15	0.18	0.23	0.28	0.34	0.42	0.52	0.64	0.80	0.98
25.0	0.18	0.22	0.27	0.33	0.41	0.50	0.60	0.74	0.90	1.10
32.0	0.23	0.27	0.33	0.41	0.50	0.60	0.74	0.88	1.10	1.30
38.0	0.26	0.32	0.38	0.46	0.56	0.68	0.82	1.00	1.20	1.45
45.0	0.30	0.36	0.43	0.52	0.64	0.76	0.92	1.10	1.35	1.60
52.0	0.33	0.40	0.48	0.58	0.70	0.84	1.00	1.20	1.45	1.75
63.0	0.39	0.47	0.56	0.67	0.80	0.96	1.14	1.35	1.65	1.95

Notes on Drilling

1. Step feeding or pecking is required for drilling greater than 3 x diameter
2. When drilling cast surface & black (ie. not machined surface), reduce drilling speed by 20%

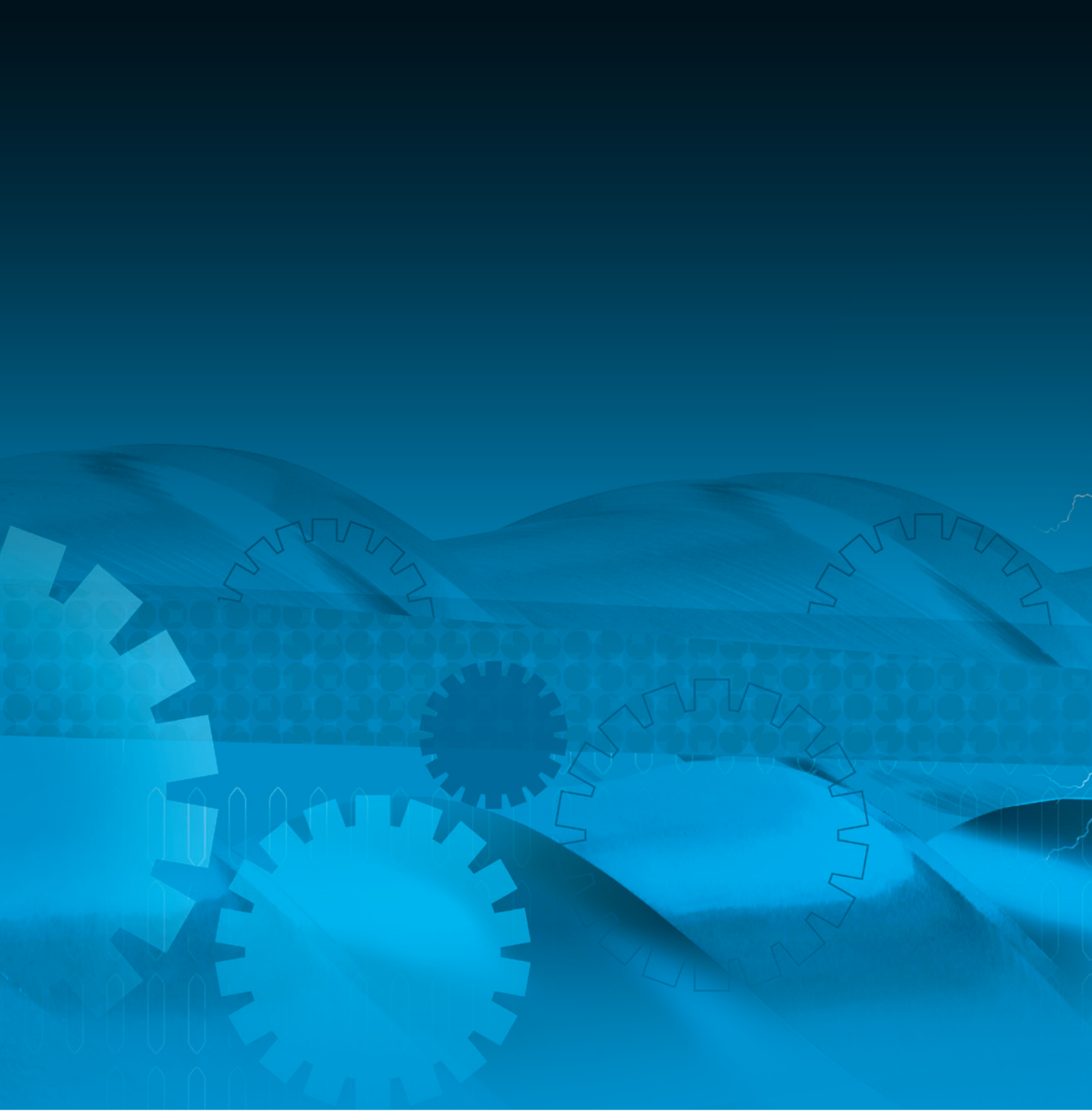
METRIC DRILLS (mm size)

Ø = nominal tap size (mm)
n = spindle speed (RPM)
v_c = cutting speed (m/min)
f = feed (mm/rev)
v_f = feed rate (mm/min)

$$n = \frac{v_c \times 1000}{Ø \times \pi} \simeq \frac{v_c}{Ø} \times 318$$

$$v_c = \frac{n \times Ø \times \pi}{1000} \simeq \frac{n \times Ø}{318}$$

$$v_f = f \times n$$



Sutton Tools Pty Ltd ABN 12 004 175 731

Australia (Head Office) **T** +61 3 9280 0800 **F** +61 3 9464 0015
378 Settlement Road, Thomastown 3074, Victoria Australia
Customer Service: **T** 1800 335 350 **F** 1800 333 127 **E** cservice@sutton.com.au
Special Sales: **T** 1800 035 010 **F** 1800 804 084 **E** specsales@sutton.com.au

Asia 1 Ubi View, #03-18 Focus One, Singapore 408555
T +65 6745 6388 **F** +65 6745 5080 **E** suttontools.sg@sutton.com.au

Europe Postbus 2092, 5001 CA Tilburg, Jellinghausstraat 28, 5048 AZ Tilburg, The Netherlands
T +31 13 220 1480 **F** +31 13 220 1481 **E** suttontools.eu@sutton.com.au

Global Offices
Asia Hong Kong • Singapore
Australasia Australia (Head Office) • New Zealand
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www.sutton.com.au

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