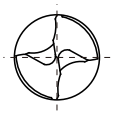
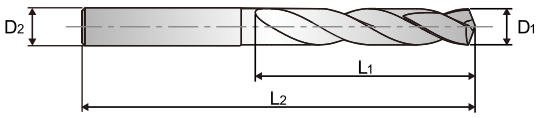
CARBIDE, DRILLS for GENERAL without COOLANT HOLES

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron.
- Self centering and chip breaking by special thinning.
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life.
- Optimized flute shape for strength of drilling and smooth chip evacuation.

3 × D





DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

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DH223 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230300	3.0	6	20	62
DH2230310	3.1	6	20	62
DH2230320	3.2	6	20	62
DH2230330	3.3	6	20	62
DH2230340	3.4	6	20	62
DH2230350	3.5	6	20	62
DH2230360	3.6	6	20	62
DH2230370	3.7	6	20	62
DH2230380	3.8	6	24	66
DH2230390	3.9	6	24	66
DH2230400	4.0	6	24	66
DH2230410	4.1	6	24	66
DH2230420	4.2	6	24	66
DH2230430	4.3	6	24	66
DH2230440	4.4	6	24	66
DH2230450	4.5	6	24	66
DH2230460	4.6	6	24	66
DH2230470	4.7	6	24	66
DH2230480	4.8	6	28	66
DH2230490	4.9	6	28	66
DH2230500	5.0	6	28	66
DH2230510	5.1	6	28	66
DH2230520	5.2	6	28	66
DH2230530	5.3	6	28	66
DH2230540	5.4	6	28	66
DH2230550	5.5	6	28	66
DH2230560	5.6	6	28	66
DH2230570	5.7	6	28	66
DH2230580	5.8	6	28	66
DH2230590	5.9	6	28	66
DH2230600	6.0	6	28	66
DH2230610	6.1	8	34	79

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230620	6.2	8	34	79
DH2230630	6.3	8	34	79
DH2230640	6.4	8	34	79
DH2230650	6.5	8	34	79
DH2230660	6.6	8	34	79
DH2230670	6.7	8	34	79
DH2230680	6.8	8	34	79
DH2230690	6.9	8	34	79
DH2230700	7.0	8	34	79
DH2230710	7.1	8	41	79
DH2230720	7.2	8	41	79
DH2230730	7.3	8	41	79
DH2230740	7.4	8	41	79
DH2230750	7.5	8	41	79
DH2230760	7.6	8	41	79
DH2230770	7.7	8	41	79
DH2230780	7.8	8	41	79
DH2230790	7.9	8	41	79
DH2230800	8.0	8	41	79
DH2230810	8.1	10	47	89
DH2230820	8.2	10	47	89
DH2230830	8.3	10	47	89
DH2230840	8.4	10	47	89
DH2230850	8.5	10	47	89
DH2230860	8.6	10	47	89
DH2230870	8.7	10	47	89
DH2230880	8.8	10	47	89
DH2230890	8.9	10	47	89
DH2230900	9.0	10	47	89
DH2230910	9.1	10	47	89
DH2230920	9.2	10	47	89
DH2230930	9.3	10	47	89

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CARBIDE, DRILLS for GENERAL without COOLANT HOLES

▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron.
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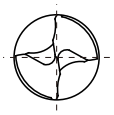

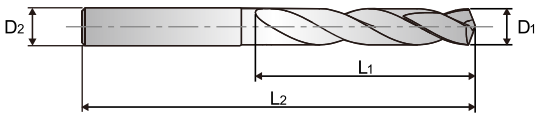

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140°

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DH223 SERIES

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2230940	9.4	10	47	89
DH2230950	9.5	10	47	89
DH2230960	9.6	10	47	89
DH2230970	9.7	10	47	89
DH2230980	9.8	10	47	89
DH2230990	9.9	10	47	89
DH2231000	10.0	10	47	89
DH2231010	10.1	12	55	102
DH2231020	10.2	12	55	102
DH2231030	10.3	12	55	102
DH2231040	10.4	12	55	102
DH2231050	10.5	12	55	102
DH2231060	10.6	12	55	102
DH2231070	10.7	12	55	102
DH2231080	10.8	12	55	102
DH2231090	10.9	12	55	102
DH2231100	11.0	12	55	102
DH2231110	11.1	12	55	102
DH2231120	11.2	12	55	102
DH2231130	11.3	12	55	102
DH2231140	11.4	12	55	102
DH2231150	11.5	12	55	102
DH2231160	11.6	12	55	102
DH2231170	11.7	12	55	102
DH2231180	11.8	12	55	102
DH2231190	11.9	12	55	102
DH2231200	12.0	12	55	102
DH2231250	12.5	14	60	107
DH2231300	13.0	14	60	107
DH2231350	13.5	14	60	107
DH2231400	14.0	14	60	107
DH2231450	14.5	16	65	115

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH2231500	15.0	16	65	115
DH2231550	15.5	16	65	115
DH2231600	16.0	16	65	115
DH2231650	16.5	18	73	123
DH2231700	17.0	18	73	123
DH2231750	17.5	18	73	123
DH2231800	18.0	18	73	123
DH2231850	18.5	20	79	131
DH2231900	19.0	20	79	131
DH2231950	19.5	20	79	131
DH2232000	20.0	20	79	131

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RECOMMENDED CUTTING CONDITIONS

DH223, DH224 SERIES without COOLANT HOLES

RPM = (rev./min.)
FEED = (mm/rev.)

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm)		Vc (m/min)	Parameter	Drill Diameter (mm)										
			1.0~2.9		1.0	2.0	3.0~20.0		3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	3		70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	4		70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	5		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	6	Low alloy steel	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	7		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	8		60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	8		30	RPM	9,550	4,770	40	RPM	4,240	3,180	2,550	2,120	1,590	1,270	1,060	910	800	710	640
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
	10	High alloyed steel, and tool steel	50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	11		30	RPM	9,550	4,770	40	RPM	4,240	3,180	2,550	2,120	1,590	1,270	1,060	910	800	710	640
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
M	12	Stainless steel	50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	13		35	RPM	11,140	5,570	45	RPM	4,770	3,580	2,860	2,390	1,790	1,430	1,190	1,020	900	800	720
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
K	15	Grey cast iron	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	16		65	RPM	20,690	10,350	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	17	Nodular cast iron	70	RPM	22,280	11,140	100	RPM	10,610	7,960	6,370	5,310	3,980	3,180	2,650	2,270	1,990	1,770	1,590
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	18		50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	19	Malleable cast iron	60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	20		50	RPM	15,920	7,960	70	RPM	7,430	5,570	4,460	3,710	2,790	2,230	1,860	1,590	1,390	1,240	1,110
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
H	38	Hardened steel	20	RPM	6,370	3,180	25	RPM	2,650	1,990	1,590	1,330	990	800	660	570	500	440	400
				FEED	0.01-0.02	0.01-0.03		FEED	0.01-0.03	0.01-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

SOLID CARBIDE, DRILLS for GENERAL

Economical drill for general applications

◎ : Excellent ○ : Good

SERIES	DH223	DH224
DRILLING DEPTH	3XD	5XD
LENGTH	SHORT	LONG
SIZE MIN	D3.0	D1.0
SIZE MAX	D20.0	D20.0
PAGE	85	87
SURFACE TREATMENT	TiAlN	

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH223	DH224
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎
	11			Quenched & Tempered	325	35	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	○	○
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

Recommended cutting conditions : p.89

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