

YE-DD20



SOLID CARBIDE DREAM DRILLS

- PRO** with/without Coolant Holes **NEW**
- GENERAL** with/without Coolant Holes
- HIGH FEED** with Coolant Holes
- FLAT BOTTOM** with/without Coolant Holes
- INOX** with Coolant Holes
- ALU** with Coolant Holes
- CFRP** for Composite Material
- MQL TYPE** with Coolant Holes(10xD - 40xD)
- for **HIGH HARDENED STEELS** HRc50-70

YG-1 CO., LTD.

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Note The information is Provided for reference only. Tool specifications are subject to change without prior notice.
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YG1DD200305009

SELECTION GUIDE



HOLEMAKING TOOLS

SERIES	PRO ^{NEW}				GENERAL					
	DGN523	DGN526	DGN506	DGN508	DH404	DH423 DH443	DH424 DH444	DH406 DH446	DH408 DH448	DH421
DRILLING DEPTH / STANDARD	3XD	5XD	3XD	5XD	3XD	3XD	5XD	3XD	5XD	8XD
LENGTH	SHORT	LONG	SHORT	LONG	STUB	SHORT	LONG	SHORT	LONG	EXTRALONG
SIZE MIN	D3.0	D1.0	D3.0	D1.0	D3.0	D32.0	D1.0	D3.0	D1.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D14.0
PAGE	8	11	14	16	24	26	29	32	34	37

SURFACE TREATMENT: Z-Coating, TiAIN

SOLID CARBIDE
**DREAM
DRILLS**

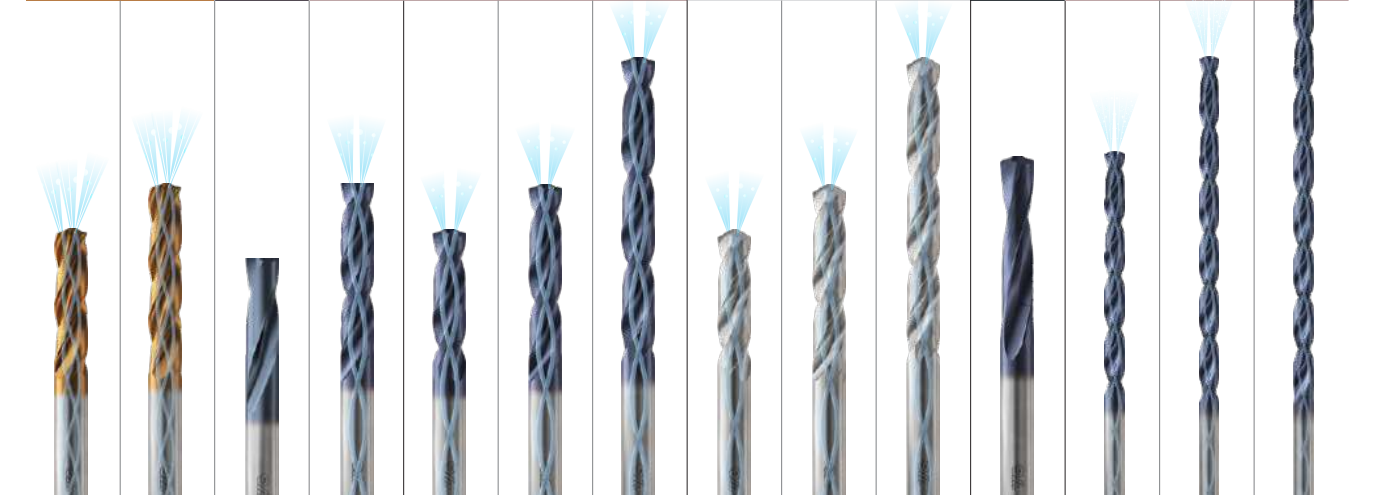


Please visit globalyg1.com/mat for material search
 ◎: Excellent ○: Good
 TECHNICAL DATA: P 97

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	DGN523	DGN526	DGN506	DGN508	DH404	DH423 DH443	DH424 DH444	DH406 DH446	DH408 DH448	DH421			
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		Cutting Alloys, PB>1%	110														
	27	Copper and Copper Alloys (Bronze / Brass)	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		Annealed	250 25														
	34		Ni or Co Based Cured	350 38														
	35		Cast	320 34														
	36	Titanium Alloys	Pure Titanium	400 _{min}														
	37		Alpha + Beta Alloys Hardened	1050 _{min}														
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													

HIGH FEED		FLAT BOTTOM		INOX			ALU			CFRP	MQL TYPE		
DGR493	DGR495	DPP447	DH450	DH451	DH452	DH453	D5432	D5433	D5434	DI473	DH510	DH515	DH520
3XD	5XD	2XD	5XD	3XD	5XD	8XD	3XD	5XD	8XD	5XD	10XD	15XD	20XD
SHORT	LONG	SHORT	LONG	SHORT	LONG	EXTRA LONG	SHORT	LONG	EXTRA LONG	LONG	EXTRA LONG	EXTRA LONG	EXTRA LONG
D5.0	D5.0	D3.0	D3.0	D3.0	D1.0	D3.0	D3.0	D3.0	D3.0	D2.5	D3.0	D3.0	D3.0
D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D14.0	D20.0	D20.0	D14.0	D12.0	D14.0	D12.0	D12.0
44	46	52	54	62	64	67	74	76	78	83	88	89	89

SURFACE TREATMENT: H-Coating, X-Coating, TiAIN, Bright, Diamond Coating



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	DGR493	DGR495	DPP447	DH450	DH451	DH452	DH453	D5432	D5433	D5434	DI473	DH510	DH515	DH520			
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	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
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	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	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
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	36	Titanium Alloys	Pure Titanium	400 _{min}																		
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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																	

GUIDE LINE TO ICONS

Standard of Tools

DIN 6539

Number of DIN Standard

Coolant Supply Pressure

45 bar

20 bar

Tool Material

CARBIDE

Point Angle

140°

Surface Treatment

TiAIN

Titanium Aluminum Nitride Coating

X-Coating

YG-1 X-Coating

H-Coating

YG-1 H-Coating

Diamond

Diamond Coating

Bright

Bright Finish

Tolerance of Dimension

m7

Tolerance of Outside Diameter

h6

Tolerance of Shank Diameter

Cutting Condition

Green

SELECTION GUIDE



HOLEMAKING TOOLS

DREAM DRILLS

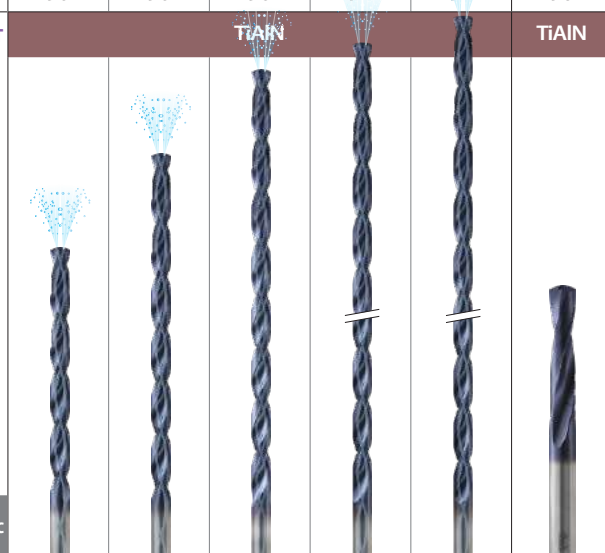
SOLID CARBIDE DREAM DRILLS



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good
TECHNICAL DATA : P 97

SERIES	MQL TYPE - End mill shank					HARDENED STEELS
	DHM10	DHM15	DHM20	DHM25	DHM30	
DRILLING DEPTH / STANDARD	10XD	15XD	20XD	25XD	30XD	3XD
LENGTH	EXTRA LONG	EXTRA LONG	EXTRA LONG	EXTRA LONG	EXTRA LONG	SHORT
SIZE MIN	D3.0	D3.0	D3.0	D3.0	D3.0	D2.6
SIZE MAX	D14.0	D12.0	D12.0	D10.0	D8.0	D14.0
PAGE	90	90	90	91	91	96



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	DHM10	DHM15	DHM20	DHM25	DHM30	DH500
P	1	Non-alloy steel	About 0.15% C Annealed	125		◎	◎	◎	◎	◎	
	2		About 0.45% C Annealed	190 13	◎	◎	◎	◎	◎		
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	6	Low alloy steel	Annealed	180 10	◎	◎	◎	◎	◎		
	7		Quenched & Tempered	275 29	○	○	○	○	○		
	8		Quenched & Tempered	300 32	○	○	○	○	○		
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	10		High alloyed steel, and tool steel	Annealed	200 15	○	○	○	○	○	
	11			Quenched & Tempered	325 35	○	○	○	○	○	
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	17	Nodular cast iron	Ferritic	160 3	◎	◎	◎	◎	◎		
	18		Pearlitic	250 25	○	○	○	○	○		
	19		Malleable cast iron	130	◎	◎	◎	◎	◎		
	20		Pearlitic	230 21	○	○	○	○	○		
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	26		Cutting Alloys, PB>1%	110							
	27	Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)	90							
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	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200 15						
	32			Cured	280 30						
	33			Annealed	250 25						
	34		Ni or Co Based	Cured	350 38						
	35			Cast	320 34						
	36		Titanium Alloys	Pure Titanium	400 _{min}						
	37			Alpha + Beta Alloys Hardened	1050 _{min}						
H	38	Hardened steel	Hardened	550 55						◎	
	39			630 60						◎	
	40		Chilled Cast Iron	Cast	400 42						
	41		Hardened Cast Iron	Hardened	550 55						



Leading Through Innovation



SOLID CARBIDE

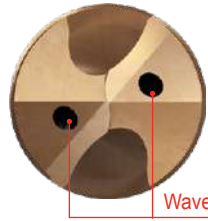
DREAM DRILLS PRO

- For General Purpose (HRC30 to HRC50)
- Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology

DREAM DRILLS PRO



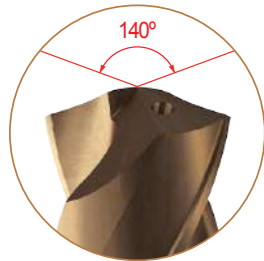
Performance Upgrade with Faster Cutting Speed



Wave Shape Cutting Edge

- Improve chip formation
- Low Cutting Force

Wave Shape 4 Facet

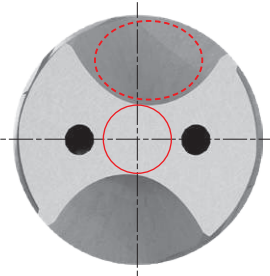


140 Degree Point Angle

- Provides edge strength and Exceptional tool life
- Good Self Centering
- Low Torque

Micro-grained Carbide

- Achieving Excellent Wear Resistance
- Maximum Tool Life and High Performance

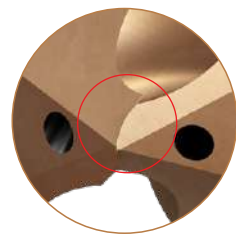


Optimized wide flute design

The unique flute structure provides good surface finish, longer tool life and requires less cutting force



Radius Shape



Helical Thinning

- Low Thrust
- Stable Torque
- Good Chip Breakage

Higher & Improved cutting conditions due to YG-1 Special Z-Coating Technology

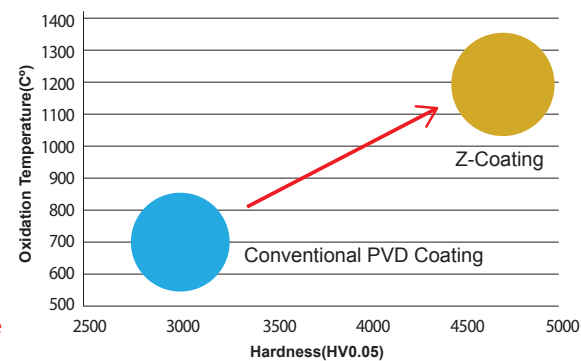
(YG-1's Unique Silicon Based Coating: Nano-Layer Coating)

- Extremely High Hardness and Heat Resistance
- For High Performance on High Hardened Steel

Superhard Ti/SiNx layer for Wear Resistance

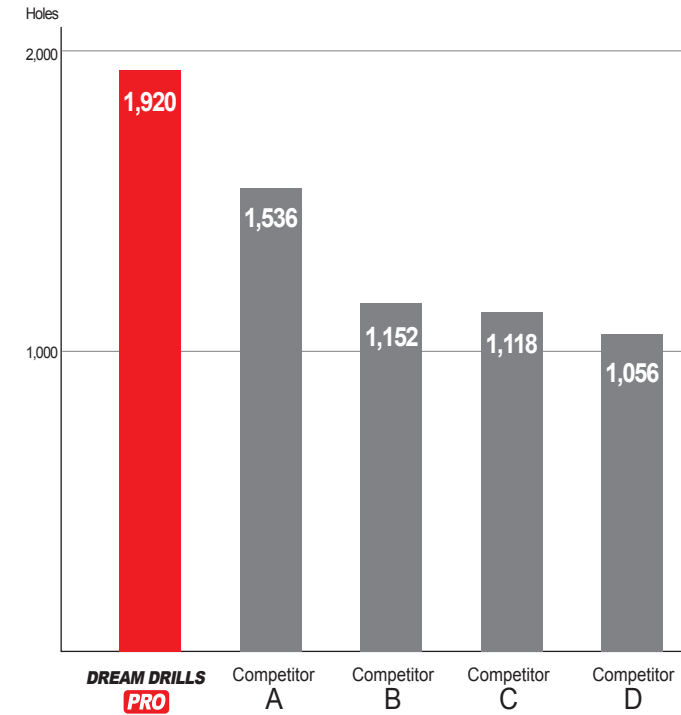


Multilayer for higher toughness and Heat Resistance



CASE STUDY

► SOLID CARBIDE DREAM DRILLS - PRO with Coolant Holes



CUTTING CONDITION	
Work Material	DIN: 42CrMo4 ANSI: 4140 JIS: SCM440 Hardness: HRC30 (HB286)
O.D SIZE(mm)	Ø10.0 (.3937 inch)
RPM	14,856 rev./min.
Cutting Speed	140 m/min
Feed	0.30 mm/rev
Drilling Depth	45.0 mm
Coolant	Internal Cooling (20 bar) Water Soluble (9% Emulsion)
Machine	Machining Center

DREAM DRILLS PRO

Total Drilling 1,920 Holes



Competitor A

Total Drilling 1,536 Holes



Competitor B

Total Drilling 1,152 Holes



Competitor C

Total Drilling 1,118 Holes



Competitor D

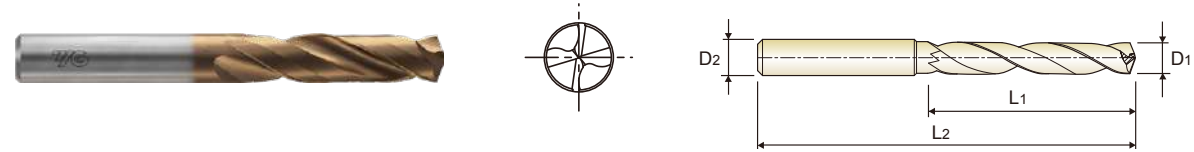
Total Drilling 1,056 Holes



Z-COATED SOLID CARBIDE DREAM DRILLS
PRO without Coolant Holes (3XD)

DGN523 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° P. 19

SHORT
3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
Z-Coating					
DGN523030	3.0	6	20	62	
DGN523031	3.1	6	20	62	
DGN523032	3.2	6	20	62	
DGN523033	3.3	6	20	62	
DGN523034	3.4	6	20	62	
DGN523035	3.5	6	20	62	
DGN523036	3.6	6	20	62	
DGN523037	3.7	6	20	62	
DGN523038	3.8	6	24	66	
DGN523039	3.9	6	24	66	
DGN523040	4.0	6	24	66	
DGN523041	4.1	6	24	66	
DGN523042	4.2	6	24	66	
DGN523043	4.3	6	24	66	
DGN523044	4.4	6	24	66	
DGN523045	4.5	6	24	66	
DGN523046	4.6	6	24	66	
DGN523047	4.7	6	24	66	
DGN523048	4.8	6	28	66	
DGN523049	4.9	6	28	66	
DGN523050	5.0	6	28	66	
DGN523051	5.1	6	28	66	
DGN523052	5.2	6	28	66	
DGN523053	5.3	6	28	66	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
Z-Coating					
DGN523054	5.4	6	28	66	
DGN523055	5.5	6	28	66	
DGN523056	5.6	6	28	66	
DGN523057	5.7	6	28	66	
DGN523058	5.8	6	28	66	
DGN523059	5.9	6	28	66	
DGN523060	6.0	6	28	66	
DGN523061	6.1	8	34	79	
DGN523062	6.2	8	34	79	
DGN523063	6.3	8	34	79	
DGN523064	6.4	8	34	79	
DGN523065	6.5	8	34	79	
DGN523066	6.6	8	34	79	
DGN523067	6.7	8	34	79	
DGN523068	6.8	8	34	79	
DGN523069	6.9	8	34	79	
DGN523070	7.0	8	34	79	
DGN523071	7.1	8	41	79	
DGN523072	7.2	8	41	79	
DGN523073	7.3	8	41	79	
DGN523074	7.4	8	41	79	
DGN523075	7.5	8	41	79	
DGN523076	7.6	8	41	79	
DGN523077	7.7	8	41	79	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

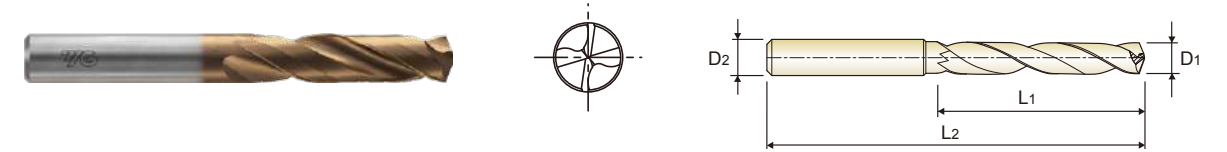
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	11	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

Z-COATED SOLID CARBIDE DREAM DRILLS
PRO without Coolant Holes (3XD)

DGN523 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° P. 19

SHORT
3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
Z-Coating					
DGN523078	7.8	8	41	79	
DGN523079	7.9	8	41	79	
DGN523080	8.0	8	41	79	
DGN523081	8.1	10	47	89	
DGN523082	8.2	10	47	89	
DGN523083	8.3	10	47	89	
DGN523084	8.4	10	47	89	
DGN523085	8.5	10	47	89	
DGN523086	8.6	10	47	89	
DGN523087	8.7	10	47	89	
DGN523088	8.8	10	47	89	
DGN523089	8.9	10	47	89	
DGN523090	9.0	10	47	89	
DGN523091	9.1	10	47	89	
DGN523092	9.2	10	47	89	
DGN523093	9.3	10	47	89	
DGN523094	9.4	10	47	89	
DGN523095	9.5	10	47	89	
DGN523096	9.6	10	47	89	
DGN523097	9.7	10	47	89	
DGN523098	9.8	10	47	89	
DGN523099	9.9	10	47	89	
DGN523100	10.0	10	47	89	
DGN523101	10.1	12	55	102	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
Z-Coating					
DGN523102	10.2	12	55	102	
DGN523103	10.3	12	55	102	
DGN523104	10.4	12	55	102	
DGN523105	10.5	12	55	102	
DGN523106	10.6	12	55	102	
DGN523107	10.7	12	55	102	
DGN523108	10.8	12	55	102	
DGN523109	10.9	12	55	102	
DGN523110	11.0	12	55	102	
DGN523111	11.1	12	55	102	
DGN523112	11.2	12	55	102	
DGN523113	11.3	12	55	102	
DGN523114	11.4	12	55	102	
DGN523115	11.5	12	55	102	
DGN523116	11.6	12	55	102	
DGN523117	11.7	12	55	102	
DGN523118	11.8	12	55	102	
DGN523119	11.9	12	55	102	
DGN523120	12.0	12	55	102	
DGN523123	12.3	14	60	107	
DGN523125	12.5	14	60	107	
DGN523128	12.8	14	60	107	
DGN523130	13.0	14	60	107	
DGN523135	13.5	14	60	107	

▶ Other shank types are available on your request.

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◎ : Excellent ○ : Good

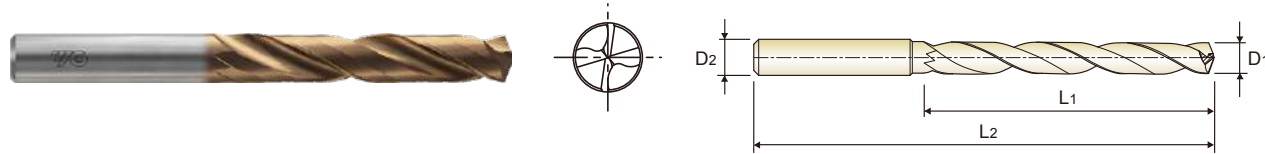
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	11	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

Z-COATED SOLID CARBIDE DREAM DRILLS
PRO without Coolant Holes (5XD)

DGN526 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° P. 19

LONG
5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
Z-Coating					
DGN526058	5.8	6	44		82
DGN526059	5.9	6	44		82
DGN526060	6.0	6	44		82
DGN526061	6.1	8	53		91
DGN526062	6.2	8	53		91
DGN526063	6.3	8	53		91
DGN526064	6.4	8	53		91
DGN526065	6.5	8	53		91
DGN526066	6.6	8	53		91
DGN526067	6.7	8	53		91
DGN526068	6.8	8	53		91
DGN526069	6.9	8	53		91
DGN526070	7.0	8	53		91
DGN526071	7.1	8	53		91
DGN526072	7.2	8	53		91
DGN526073	7.3	8	53		91
DGN526074	7.4	8	53		91
DGN526075	7.5	8	53		91
DGN526076	7.6	8	53		91
DGN526077	7.7	8	53		91
DGN526078	7.8	8	53		91
DGN526079	7.9	8	53		91
DGN526080	8.0	8	53		91
DGN526081	8.1	10	61		103

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
Z-Coating					
DGN526082	8.2	10	61		103
DGN526083	8.3	10	61		103
DGN526084	8.4	10	61		103
DGN526085	8.5	10	61		103
DGN526086	8.6	10	61		103
DGN526087	8.7	10	61		103
DGN526088	8.8	10	61		103
DGN526089	8.9	10	61		103
DGN526090	9.0	10	61		103
DGN526091	9.1	10	61		103
DGN526092	9.2	10	61		103
DGN526093	9.3	10	61		103
DGN526094	9.4	10	61		103
DGN526095	9.5	10	61		103
DGN526096	9.6	10	61		103
DGN526097	9.7	10	61		103
DGN526098	9.8	10	61		103
DGN526099	9.9	10	61		103
DGN526100	10.0	10	61		103
DGN526101	10.1	12	71		118
DGN526102	10.2	12	71		118
DGN526103	10.3	12	71		118
DGN526104	10.4	12	71		118
DGN526105	10.5	12	71		118

▶ Other shank types are available on your request.

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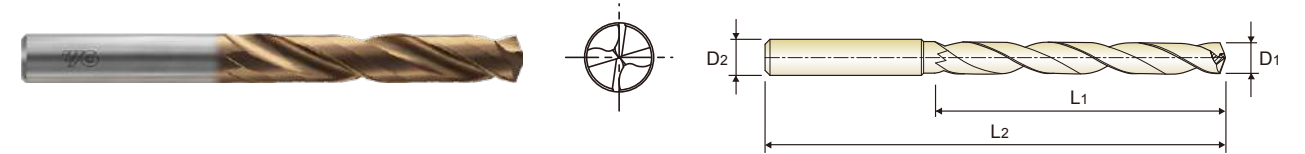
ISO Material Description	P										M				K									
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	10	15	35	23	10	10	26	3	25						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRc											15	30	25	38	34			55	60	42	55				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommended																									

Z-COATED SOLID CARBIDE DREAM DRILLS
PRO without Coolant Holes (5XD)

DGN526 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° P. 19

LONG
5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
Z-Coating					
DGN526106	10.6	12	71		118
DGN526107	10.7	12	71		118
DGN526108	10.8	12	71		118
DGN526109	10.9	12	71		118
DGN526110	11.0	12	71		118
DGN526111	11.1	12	71		118
DGN526112	11.2	12	71		118
DGN526113	11.3	12	71		118
DGN526114	11.4	12	71		118
DGN526115	11.5	12	71		118
DGN526116	11.6	12	71		118
DGN526117	11.7	12	71		118
DGN526118	11.8	12	71		118
DGN526119	11.9	12	71		118
DGN526120	12.0	12	71		118
DGN526122	12.2	14	77		124
DGN526125	12.5	14	77		124
DGN526128	12.8	14	77		124
DGN526130	13.0	14	77		124
DGN526135	13.5	14	77		124
DGN526138	13.8	14	77		124
DGN526140	14.0	14	77		124

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
Z-Coating					
DGN526142	14.2	16	83		133
DGN526145	14.5	16	83		133
DGN526148	14.8	16	83		133
DGN526150	15.0	16	83		133
DGN526151	15.1	16	83		133
DGN526152	15.2	16	83		133
DGN526155	15.5	16	83		133
DGN526158	15.8	16	83		133
DGN526160	16.0	16	83		133
DGN526165	16.5	18	93		143
DGN526170	17.0	18	93		143
DGN526173	17.3	18	93		143
DGN526175	17.5	18	93		143
DGN526177	17.7	18	93		143
DGN526180	18.0	18	93		143
DGN526185	18.5	20	101		153
DGN526190	19.0	20	101		153
DGN526193	19.3	20	101		153
DGN526195	19.5	20	101		153
DGN526200	20.0	20	101		153

▶ Other shank types are available on your request.

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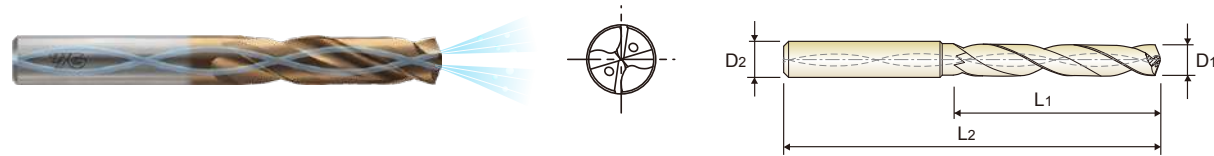
ISO Material Description	P										M				K									
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	10	15	35	23	10	10	26	3	25						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRc											15	30	25	38	34			55	60	42	55				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550				
Recommended																									

Z-COATED SOLID CARBIDE DREAM DRILLS PRO with Coolant Holes (3XD)

DGN506 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRC30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 20

SHORT 3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
DGN506030	3.0	6	20	62	62
DGN506031	3.1	6	20	62	62
DGN506032	3.2	6	20	62	62
DGN506033	3.3	6	20	62	62
DGN506034	3.4	6	20	62	62
DGN506035	3.5	6	20	62	62
DGN506036	3.6	6	20	62	62
DGN506037	3.7	6	20	62	62
DGN506038	3.8	6	24	66	66
DGN506039	3.9	6	24	66	66
DGN506040	4.0	6	24	66	66
DGN506041	4.1	6	24	66	66
DGN506042	4.2	6	24	66	66
DGN506043	4.3	6	24	66	66
DGN506044	4.4	6	24	66	66
DGN506045	4.5	6	24	66	66
DGN506046	4.6	6	24	66	66
DGN506047	4.7	6	24	66	66
DGN506048	4.8	6	28	66	66
DGN506049	4.9	6	28	66	66
DGN506050	5.0	6	28	66	66
DGN506051	5.1	6	28	66	66
DGN506052	5.2	6	28	66	66
DGN506053	5.3	6	28	66	66
DGN506054	5.4	6	28	66	66
DGN506055	5.5	6	28	66	66

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
DGN506056	5.6	6	28	66	66
DGN506057	5.7	6	28	66	66
DGN506058	5.8	6	28	66	66
DGN506059	5.9	6	28	66	66
DGN506060	6.0	6	28	66	66
DGN506061	6.1	8	34	79	79
DGN506062	6.2	8	34	79	79
DGN506063	6.3	8	34	79	79
DGN506064	6.4	8	34	79	79
DGN506065	6.5	8	34	79	79
DGN506066	6.6	8	34	79	79
DGN506067	6.7	8	34	79	79
DGN506068	6.8	8	34	79	79
DGN506069	6.9	8	34	79	79
DGN506070	7.0	8	34	79	79
DGN506071	7.1	8	41	79	79
DGN506072	7.2	8	41	79	79
DGN506073	7.3	8	41	79	79
DGN506074	7.4	8	41	79	79
DGN506075	7.5	8	41	79	79
DGN506076	7.6	8	41	79	79
DGN506077	7.7	8	41	79	79
DGN506078	7.8	8	41	79	79
DGN506079	7.9	8	41	79	79
DGN506080	8.0	8	41	79	79
DGN506081	8.1	10	47	89	89

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

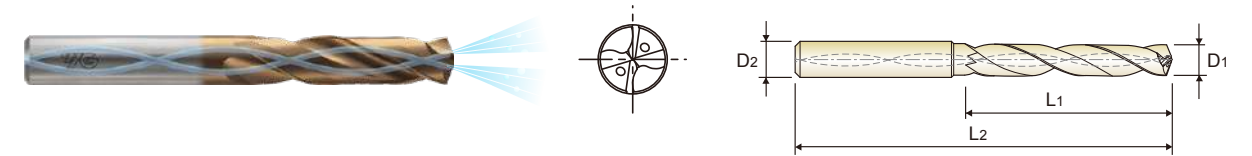
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

Z-COATED SOLID CARBIDE DREAM DRILLS PRO with Coolant Holes (3XD)

DGN506 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRC30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 20

SHORT 3 x D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
DGN506082	8.2	10	47	89	89
DGN506083	8.3	10	47	89	89
DGN506084	8.4	10	47	89	89
DGN506085	8.5	10	47	89	89
DGN506086	8.6	10	47	89	89
DGN506087	8.7	10	47	89	89
DGN506088	8.8	10	47	89	89
DGN506089	8.9	10	47	89	89
DGN506090	9.0	10	47	89	89
DGN506091	9.1	10	47	89	89
DGN506092	9.2	10	47	89	89
DGN506093	9.3	10	47	89	89
DGN506094	9.4	10	47	89	89
DGN506095	9.5	10	47	89	89
DGN506096	9.6	10	47	89	89
DGN506097	9.7	10	47	89	89
DGN506098	9.8	10	47	89	89
DGN506099	9.9	10	47	89	89
DGN506100	10.0	10	47	89	89
DGN506101	10.1	12	55	102	102
DGN506102	10.2	12	55	102	102
DGN506103	10.3	12	55	102	102
DGN506104	10.4	12	55	102	102
DGN506105	10.5	12	55	102	102
DGN506106	10.6	12	55	102	102
DGN506107	10.7	12	55	102	102
DGN506108	10.8	12	55	102	102
DGN506109	10.9	12	55	102	102

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length L2
			L1	L2	
DGN506110	11.0	12	55	102	102
DGN506111	11.1	12	55	102	102
DGN506112	11.2	12	55	102	102
DGN506113	11.3	12	55	102	102
DGN506114	11.4	12	55	102	102
DGN506115	11.5	12	55	102	102
DGN506116	11.6	12	55	102	102
DGN506117	11.7	12	55	102	102
DGN506118	11.8	12	55	102	102
DGN506119	11.9	12	55	102	102
DGN506120	12.0	12	55	102	102
DGN506125	12.5	14	60	107	107
DGN506130	13.0	14	60	107	107
DGN506135	13.5	14	60	107	107
DGN506140	14.0	14	60	107	107
DGN506145	14.5	16	65	115	115
DGN506150	15.0	16	65	115	115
DGN506155	15.5	16	65	115	115
DGN506160	16.0	16	65	115	115
DGN506165	16.5	18	73	123	123
DGN506170	17.0	18	73	123	123
DGN506175	17.5	18	73	123	123
DGN506180	18.0	18	73	123	123
DGN506185	18.5	20	79	131	131
DGN506190	19.0	20	79	131	131
DGN506195	19.5	20	79	131	131
DGN506200	20.0	20	79	131	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

Z-COATED SOLID CARBIDE DREAM DRILLS PRO with Coolant Holes (5XD)

DGN508 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRC30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 20

LONG 5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
DGN508010	1.0	3	8		55
DGN508011	1.1	3	12		55
DGN508012	1.2	3	12		55
DGN508013	1.3	3	12		55
DGN508014	1.4	3	12		55
DGN508015	1.5	3	16		55
DGN508016	1.6	3	16		55
DGN508017	1.7	3	16		55
DGN508018	1.8	3	16		55
DGN508019	1.9	3	16		55
DGN508020	2.0	4	21		57
DGN508021	2.1	4	21		57
DGN508022	2.2	4	21		57
DGN508023	2.3	4	21		57
DGN508024	2.4	4	21		57
DGN508025	2.5	4	21		57
DGN508026	2.6	4	21		57
DGN508027	2.7	4	21		57
DGN508028	2.8	4	21		57
DGN508029	2.9	4	21		57
DGN508030	3.0	6	28		66
DGN508031	3.1	6	28		66
DGN508032	3.2	6	28		66
DGN508033	3.3	6	28		66

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
DGN508034	3.4	6	28		66
DGN508035	3.5	6	28		66
DGN508036	3.6	6	28		66
DGN508037	3.7	6	28		66
DGN508038	3.8	6	36		74
DGN508039	3.9	6	36		74
DGN508040	4.0	6	36		74
DGN508041	4.1	6	36		74
DGN508042	4.2	6	36		74
DGN508043	4.3	6	36		74
DGN508044	4.4	6	36		74
DGN508045	4.5	6	36		74
DGN508046	4.6	6	36		74
DGN508047	4.7	6	36		74
DGN508048	4.8	6	44		82
DGN508049	4.9	6	44		82
DGN508050	5.0	6	44		82
DGN508051	5.1	6	44		82
DGN508052	5.2	6	44		82
DGN508053	5.3	6	44		82
DGN508054	5.4	6	44		82
DGN508055	5.5	6	44		82
DGN508056	5.6	6	44		82
DGN508057	5.7	6	44		82

▶ Other shank types are available on your request.

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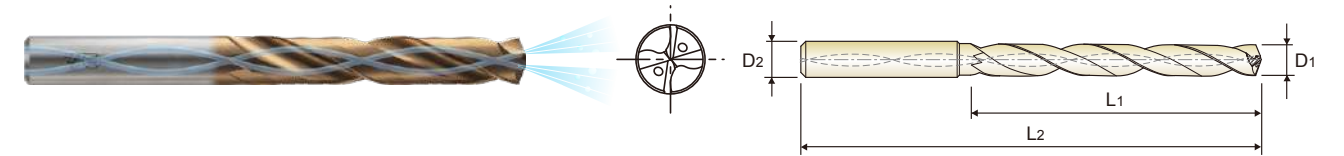
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloy steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC		13	25	28	32	10	29	32	38	15	11	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

Z-COATED SOLID CARBIDE DREAM DRILLS PRO with Coolant Holes (5XD)

DGN508 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRC30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 20

LONG 5 x D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
DGN508058	5.8	6	44		82
DGN508059	5.9	6	44		82
DGN508060	6.0	6	44		82
DGN508061	6.1	8	53		91
DGN508062	6.2	8	53		91
DGN508063	6.3	8	53		91
DGN508064	6.4	8	53		91
DGN508065	6.5	8	53		91
DGN508066	6.6	8	53		91
DGN508067	6.7	8	53		91
DGN508068	6.8	8	53		91
DGN508069	6.9	8	53		91
DGN508070	7.0	8	53		91
DGN508071	7.1	8	53		91
DGN508072	7.2	8	53		91
DGN508073	7.3	8	53		91
DGN508074	7.4	8	53		91
DGN508075	7.5	8	53		91
DGN508076	7.6	8	53		91
DGN508077	7.7	8	53		91
DGN508078	7.8	8	53		91
DGN508079	7.9	8	53		91
DGN508080	8.0	8	53		91
DGN508081	8.1	10	61		103

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
DGN508082	8.2	10	61		103
DGN508083	8.3	10	61		103
DGN508084	8.4	10	61		103
DGN508085	8.5	10	61		103
DGN508086	8.6	10	61		103
DGN508087	8.7	10	61		103
DGN508088	8.8	10	61		103
DGN508089	8.9	10	61		103
DGN508090	9.0	10	61		103
DGN508091	9.1	10	61		103
DGN508092	9.2	10	61		103
DGN508093	9.3	10	61		103
DGN508094	9.4	10	61		103
DGN508095	9.5	10	61		103
DGN508096	9.6	10	61		103
DGN508097	9.7	10	61		103
DGN508098	9.8	10	61		103
DGN508099	9.9	10	61		103
DGN508100	10.0	10	61		103
DGN508101	10.1	12	71		118
DGN508102	10.2	12	71		118
DGN508103	10.3	12	71		118
DGN508104	10.4	12	71		118
DGN508105	10.5	12	71		118

▶ Other shank types are available on your request.

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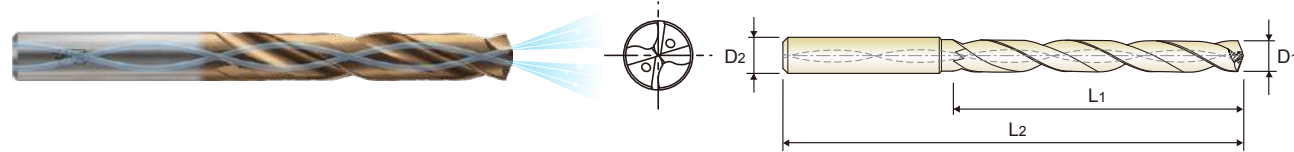
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloy steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC		13	25	28	32	10	29	32	38	15	11	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

Z-COATED SOLID CARBIDE DREAM DRILLS
PRO with Coolant Holes (5XD)

DGN508 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-45), Cast Iron
- ▶ Wave shape cutting edge to improve chip formation for low cutting force
- ▶ Helical thinning for low thrust, stable torque and good chip breakage
- ▶ Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology



LONG
5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
DGN508106	10.6	12	71	118
DGN508107	10.7	12	71	118
DGN508108	10.8	12	71	118
DGN508109	10.9	12	71	118
DGN508110	11.0	12	71	118
DGN508111	11.1	12	71	118
DGN508112	11.2	12	71	118
DGN508113	11.3	12	71	118
DGN508114	11.4	12	71	118
DGN508115	11.5	12	71	118
DGN508116	11.6	12	71	118
DGN508117	11.7	12	71	118
DGN508118	11.8	12	71	118
DGN508119	11.9	12	71	118
DGN508120	12.0	12	71	118
DGN508125	12.5	14	77	124

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
DGN508130	13.0	14	77	124
DGN508135	13.5	14	77	124
DGN508140	14.0	14	77	124
DGN508145	14.5	16	83	133
DGN508150	15.0	16	83	133
DGN508155	15.5	16	83	133
DGN508160	16.0	16	83	133
DGN508165	16.5	18	93	143
DGN508170	17.0	18	93	143
DGN508175	17.5	18	93	143
DGN508180	18.0	18	93	143
DGN508185	18.5	20	101	153
DGN508190	19.0	20	101	153
DGN508195	19.5	20	101	153
DGN508200	20.0	20	101	153

▶ Other shank types are available on your request.

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ISO	P										M				K																													
Material Description	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel				Stainless steel				Grey cast iron				Nodular cast iron				Malleable cast iron																	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			
HRc	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	180	250	130	230	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	55	60	42	55	55	60	42	55	55	60	42	55	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

RECOMMENDED CUTTING CONDITIONS

DGN523, DGN526 SERIES without COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)		Vc	Parameter	Drill Diameter (mm)					
					1.0	2.0			3.0	4.0	5.0	6.0		
P	2	Non-alloy steel	85	RPM 27,060 FEED 0.03-0.05	13,530	0.05-0.07	120	RPM 12,730 FEED 0.06-0.12	9,550	0.08-0.14	7,640	0.14-0.20	6,370	0.16-0.22
			85	RPM 27,060 FEED 0.03-0.05	13,530	0.05-0.07	120	RPM 12,730 FEED 0.06-0.12	9,550	0.08-0.14	7,640	0.14-0.20	6,370	0.16-0.22
			85	RPM 27,060 FEED 0.03-0.05	13,530	0.05-0.07	120	RPM 12,730 FEED 0.06-0.12	9,550	0.08-0.14	7,640	0.14-0.20	6,370	0.16-0.22
	5	Low alloy steel	75	RPM 23,870 FEED 0.03-0.05	11,940	0.05-0.07	95	RPM 10,080 FEED 0.04-0.10	7,560	0.07-0.13	6,050	0.10-0.16	5,040	0.12-0.18
			85	RPM 27,060 FEED 0.03-0.05	13,530	0.05-0.07	120	RPM 12,730 FEED 0.06-0.12	9,550	0.08-0.14	7,640	0.14-0.20	6,370	0.16-0.22
			75	RPM 23,870 FEED 0.03-0.05	11,940	0.05-0.07	95	RPM 10,080 FEED 0.04-0.10	7,560	0.07-0.13	6,050	0.10-0.16	5,040	0.12-0.18
			75	RPM 23,870 FEED 0.02-0.04	11,940	0.03-0.05	95	RPM 10,080 FEED 0.04-0.10	7,560	0.07-0.13	6,050	0.10-0.16	5,040	0.12-0.18
	9	High alloyed steel, and tool steel	36	RPM 11,460 FEED 0.02-0.04	5,730	0.03-0.05	50	RPM 5,310 FEED 0.03-0.08	3,980	0.05-0.11	3,180	0.08-0.14	2,650	0.10-0.16
			60	RPM 19,100 FEED 0.03-0.05	9,550	0.05-0.07	80	RPM 8,490 FEED 0.04-0.10	6,370	0.07-0.13	5,090	0.10-0.16	4,240	0.12-0.18
			35	RPM 11,140 FEED 0.02-0.04	5,570	0.03-0.05	45	RPM 4,770 FEED 0.03-0.08	3,580	0.05-0.11	2,860	0.08-0.14	2,390	0.10-0.16
			60	RPM 19,100 FEED 0.03-0.05	9,550	0.05-0.07	85	RPM 9,020 FEED 0.06-0.12	6,760	0.08-0.14	5,410	0.10-0.16	4,510	0.12-0.18
M	12	Stainless steel	60	RPM 19,100 FEED 0.03-0.05	9,550	0.05-0.07	85	RPM 9,020 FEED 0.06-0.12	6,760	0.08-0.14	5,410	0.10-0.16	4,510	0.12-0.18
			45	RPM 14,320 FEED 0.02-0.04	7,160	0.03-0.05	55	RPM 5,840 FEED 0.04-0.10	4,380	0.07-0.13	3,500	0.10-0.16	2,920	0.12-0.18
K	15	Grey cast iron	85	RPM 27,060 FEED 0.04-0.06	13,530	0.04-0.06	120	RPM 12,730 FEED 0.08-0.14	9,550	0.12-0.18	7,640	0.18-0.24	6,370	0.20-0.26
			80	RPM 25,460 FEED 0.04-0.06	12,730	0.04-0.06	95	RPM 10,080 FEED 0.06-0.12	7,560	0.08-0.14	6,050	0.14-0.20	5,040	0.16-0.22
			85	RPM 27,060 FEED 0.04-0.06	13,530	0.04-0.06	120	RPM 12,730 FEED 0.08-0.14	9,550	0.12-0.18	7,640	0.18-0.24	6,370	0.20-0.26
	17	Nodular cast iron	60	RPM 19,100 FEED 0.04-0.06	9,550	0.04-0.06	85	RPM 9,020 FEED 0.06-0.12	6,760	0.08-0.14	5,410	0.14-0.20	4,510	0.16-0.22
			75	RPM 23,870 FEED 0.04-0.06	11,940	0.04-0.06	95	RPM 10,080 FEED 0.08-0.14	7,560	0.12-0.18	6,050	0.18-0.24	5,040	0.20-0.26
			60	RPM 19,100 FEED 0.03-0.05	9,550	0.05-0.07	85	RPM 9,020 FEED 0.06-0.12	6,760	0.08-0.14	5,410	0.14-0.20	4,510	0.16-0.22

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)											
					8.0	10.0	12.0	14.0	16.0	18.0	20.0					
P	2	Non-alloy steel	120	RPM 4,770 FEED 0.18-0.24	3,820	0.22-0.28	3,180	0.20-0.30	2,730	0.22-0.32	2,390	0.24-0.34	2,120	0.28-0.38	1,910	0.30-0.40
			120	RPM 4,770 FEED 0.18-0.24	3,820	0.22-0.28	3,180	0.20-0.30	2,730	0.22-0.32	2,390	0.24-0.34	2,120	0.28-0.38	1,910	0.30-0.40
			120	RPM 4,770 FEED 0.14-0.20	3,820	0.18-0.24	3,180	0.14-0.24	2,730	0.16-0.26	2,390	0.18-0.28	2,120	0.20-0.30	1,910	0.22-0.32
	5	Low alloy steel	95	RPM 3,780 FEED 0.14-0.20	3,020	0.18-0.24	2,520	0.14-0.24	2,160	0.16-0.26	1,890	0.18-0.28	1,680	0.20-0.30	1,510	0.22-0.32
			120	RPM 4,770 FEED 0.18-0.24	3,820	0.20-0.30	3,180	0.22-0.32	2,730	0.24-0.34	2,390	0.28-0.38	2,120	0.30-0.40		
			95	RPM 3,780 FEED 0.14-0.20	3,020	0.20-0.30	2,520	0.16-0.26	2,160	0.18-0.28	1,890	0.20-0.30	1,680	0.22-0.32		
			95	RPM 3,780 FEED 0.14-0.20	3,020	0.20-0.30	2,520	0.16-0.26	2,160	0.18-0.28	1,890	0.20-0.30	1,680	0.22-0.32		
	9	High alloyed steel, and tool steel	50	RPM 1,990 FEED 0.12-0.18	1,590	0.14-0.20	1,330	0.12-0.22	1,140	0.13-0.23	990	0.14-0.24	880	0.16-0.26	800	0.18-0.28
			80	RPM 3,180 FEED 0.14-0.20	2,550	0.18-0.24	2,120	0.14-0.24	1,820	0.16-0.26	1,590	0.18-0.28	1,410	0.20-0.30	1,270	0.22-0.32
			45	RPM 1,790 FEED 0.12-0.18	1,430	0.14-0.20	1,190	0.13-0.23	1,020	0.14-0.24	900	0.16-0.26	800	0.18-0.28		
			45	RPM 1,790 FEED 0.12-0.18	1,430	0.14-0.20	1,190	0.13-0.23	1,020	0.14-0.24	900	0.16-0.26	800	0.18-0.28		
M	12	Stainless steel	85	RPM 3,380 FEED 0.18-0.24	2,710	0.22-0.28	2,250	0.20-0.30	1,930	0.22-0.32	1,690	0.24-0.34	1,500	0.28-0.38	1,350	0.30-0.40
			55	RPM 2,190 FEED 0.14-0.20	1,750	0.18-0.24	1,460	0.16-0.26	1,250	0.18-0.28	1,090	0.20-0.30	970	0.22-0.32		
K	15	Grey cast iron	120	RPM 4,770 FEED 0.18-0.24	3,820	0.22-0.28	3,180	0.20-0.30	2,730	0.22-0.32	2,390	0.24-0.34	2,120	0.28-0.38	1,910	0.30-0.40
			95	RPM 3,780 FEED 0.18-0.24	3,020	0.22-0.28	2,520	0.20-0.30	2,160	0.22-0.32	1,890	0.24-0.34	1,680	0.28-0.38	1,510	0.30-0.40
			120	RPM 4,770 FEED 0.16-0.28	3,820	0.24-0.34	3,180	0.26-0.36	2,730	0.28-0.38	2,390	0.30-0.40	2,120	0.32-0.42	1,910	0.34-0.44
	17	Nodular cast iron	85	RPM 3,380 FEED 0.18-0.24	2,710	0.22-0.28	2,250	0.20-0.30	1,930	0.22-0.32	1,690	0.24-0.34	1,500	0.28-0.38	1,350	0.30-0.40
			95	RPM 3,780 FEED 0.16-0.28	3,020	0.24-0.34	2,520	0.26-0.36	2,160	0.28-0.38	1,890	0.30-0.40	1,680	0.32-0.42	1,510	0.34-0.44
			85	RPM 3,380 FEED 0.18-0.24	2,710	0.22-0.28	2,250	0.20-0.30	1,930	0.22-0.32	1,690	0.24-0.34	1,500	0.28-0.38	1,350	0.30-0.40

▶ Recommend to reduce the feed rate as following

Feed 100% : DGN523(3xD), DGN526(5xD)

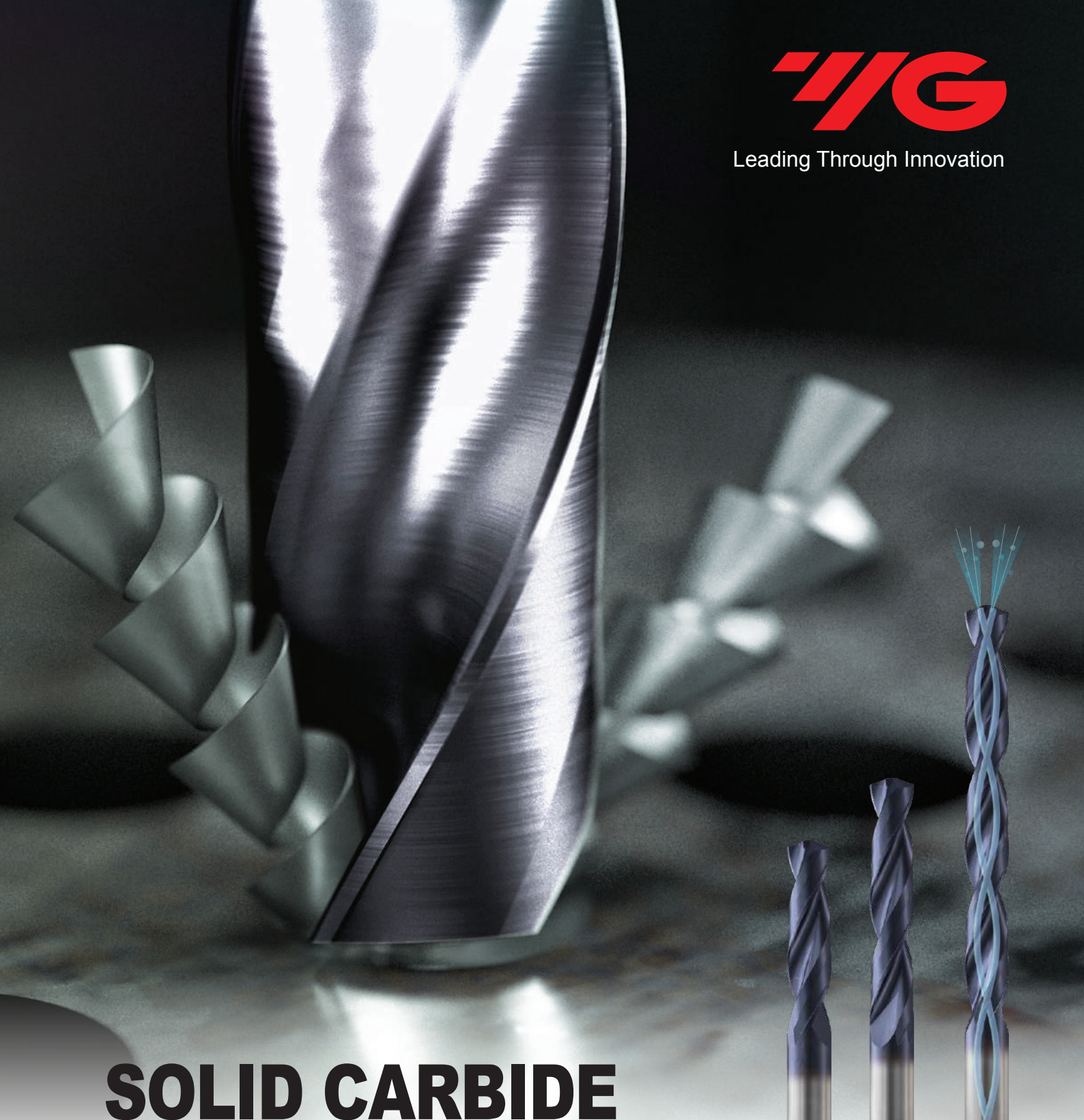
DGN506, DGN508 SERIES with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)		Vc	Parameter	Drill Diameter (mm)			
					1.0	2.0			3.0	4.0	5.0	6.0
P	2	Non-alloy steel	95	RPM	30,240	15,120	130	RPM	13,790	10,350	8,280	6,900
				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
			3	RPM	30,240	15,120	RPM	13,790	10,350	8,280	6,900	
	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		
	4		RPM	30,240	15,120	130	RPM	13,790	10,350	8,280	6,900	
			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	
	5	85	RPM	27,060	13,530	110	RPM	11,670	8,750	7,000	5,840	
			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	
	6	Low alloy steel	95	RPM	30,240	15,120	130	RPM	13,790	10,350	8,280	6,900
				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
	7		85	RPM	27,060	13,530	110	RPM	11,670	8,750	7,000	5,840
FEED				0.03-0.05	0.05-0.07	FEED		0.06-0.12	0.08-0.14	0.10-0.20	0.12-0.24	
8	95		RPM	30,240	15,120	110	RPM	11,670	8,750	7,000	5,840	
			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	
9	50	RPM	15,920	7,960	60	RPM	6,370	4,770	3,820	3,180		
		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		
10	High alloyed steel, and tool steel	70	RPM	22,280	11,140	90	RPM	9,550	7,160	5,730	4,770	
			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	
45		RPM	14,320	7,160	50	RPM	5,310	3,980	3,180	2,650		
		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		
12		Stainless steel	75	RPM	23,870	11,940	95	RPM	10,080	7,560	6,050	5,040
				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
13	55		RPM	17,510	8,750	65	RPM	6,900	5,170	4,140	3,450	
			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	
K	15		95	RPM	30,240	15,120	130	RPM	13,790	10,350	8,280	6,900
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26
		RPM		28,650	14,320	RPM		12,200	9,150	7,320	6,100	
	16	90	FEED	0.04-0.06	0.04-0.06	115	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	
			RPM	35,010	17,510		RPM	15,380	11,540	9,230	7,690	
17	Nodular cast iron	110	FEED	0.04-0.06	0.04-0.06	145	FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26	
			RPM	23,870	11,940		RPM	10,080	7,560	6,050	5,040	
18		75	FEED	0.04-0.06	0.04-0.06	95	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	
	RPM		27,060	13,530	RPM		11,670	8,750	7,000	5,840		
19	Malleable cast iron	85	FEED	0.04-0.06	0.04-0.06	110	FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26	
			RPM	23,870	11,940		RPM	10,080	7,560	6,050	5,040	
20		75	FEED	0.03-0.05	0.05-0.07	95	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22	

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)						
					8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	130	RPM	5,170	4,140	3,450	2,960	2,590	2,300	2,070
				FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40
			3	RPM	5,170	4,140	3,450	2,960	2,590	2,300	2,070
	FEED			0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
	4		130	RPM	5,170	4,140	3,450	2,960	2,590	2,300	2,070
				FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32
	5	Low alloy steel	110	RPM	4,380	3,500	2,920	2,500	2,190	1,950	1,750
				FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32
	6		130	RPM	5,170	4,140	3,450	2,960	2,590	2,300	2,070
				FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40
	7		110	RPM	4,380	3,500	2,920	2,500	2,190	1,950	1,750
FEED				0.16-0.28	0.20-0.30	0.21-0.30	0.22-0.35	0.25-0.36	0.28-0.38	0.30-0.40	
8	110	RPM	4,380	3,500	2,920	2,500	2,190	1,950	1,750		
		FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32		
9	High alloyed steel, and tool steel	60	RPM	2,390	1,910	1,590	1,360	1,190	1,060	950	
			FEED	0.12-0.18	0.14-0.20	0.12-0.22	0.13-0.23	0.14-0.24	0.16-0.26	0.18-0.28	
10		90	RPM	3,580	2,860	2,390	2,050	1,790	1,590	1,430	
			FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32	
11		50	RPM	1,990	1,590	1,330	1,140	990	880	800	
			FEED	0.12-0.18	0.14-0.20	0.12-0.22	0.13-0.23	0.14-0.24	0.16-0.26	0.18-0.28	
M	12	95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510	
			FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
13			65	RPM	2,590	2,070	1,720	1,480	1,290	1,150	1,030
	FEED	0.14-0.20		0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32		
K	15	130	RPM	5,170	4,140	3,450	2,960	2,590	2,300	2,070	
			FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.30-0.40	0.32-0.42	0.34-0.44	
			RPM	4,580	3,660	3,050	2,610	2,290	2,030	1,830	
	16	115	FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
			RPM	5,770	4,620	3,850	3,300	2,880	2,560	2,310	
17	Nodular cast iron	145	FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.30-0.40	0.32-0.42	0.34-0.44	
			RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510	
18		95	FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
	RPM		4,380	3,500	2,920	2,500	2,190	1,950	1,750		
19	Malleable cast iron	110	FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.30-0.40	0.32-0.42	0.34-0.44	
			RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510	
20		95	FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	

► Recommend to reduce the feed rate as following
Feed 100% : DGN506(3×D), DGN508(5×D)



SOLID CARBIDE

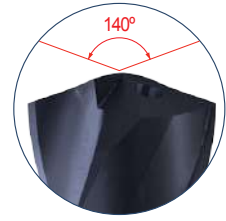
**DREAM DRILLS
GENERAL**

- For General Purpose (HRC30 to HRC50)

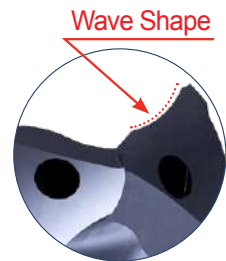
DREAM DRILLS GENERAL



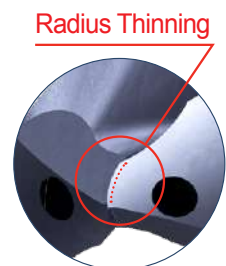
Micro-grained carbide for wear resistance and longer tool life



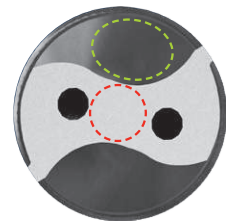
140 Degree Point Angle
for good centering and low thrust



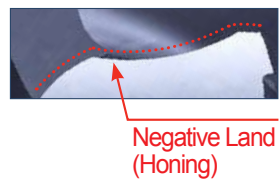
Wave shape Cutting Edge
will allow low thrust, stable torque and long tool life



Radius Thinning
for Self Centering and Chip Breaking



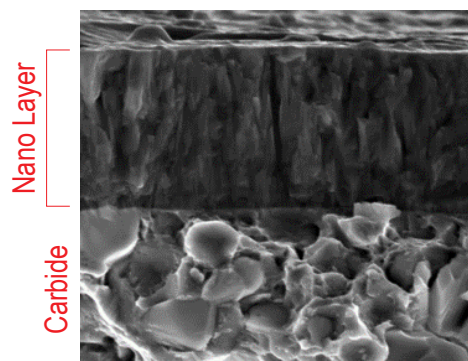
Optimized flute shape
for strength of drill and smooth chip evacuation



Negative land on the cutting edge
for Reliable Tool Life

TiAlN Coating
(Upgraded Titanium Aluminum Nitride : nano-Layer coating)
• Higher wear resistance and Lower friction
• Higher Cutting Speed and Feed
• Improved drill Hole Quality

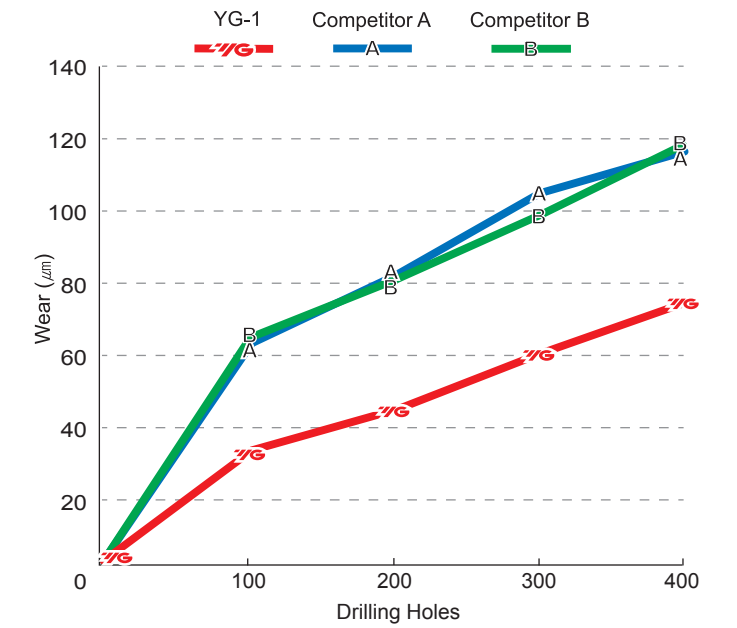
Special surface treatment after coating
to reduce friction and better chip flow.



CASE STUDY

► SOLID CARBIDE DREAM DRILLS - General with Coolant Holes

CUTTING CONDITION	
Tool	DH408015 (Dream Drill with Coolant Holes)
Size	Ø1.5 x Ø3 x 15 x 55
Work Material	• DIN: X40GrMoV51 • WR: 1.2344 • JIS: SKD61 (HRC30)
RPM	14,856 rev./min.
Feed	0.05 mm/rev.
Drilling Depth	7.5 mm
Coolant	Wet Cut

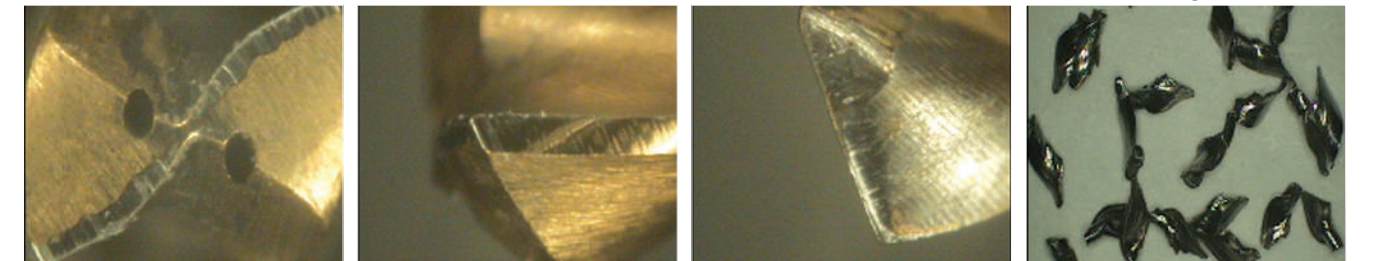


YG-1



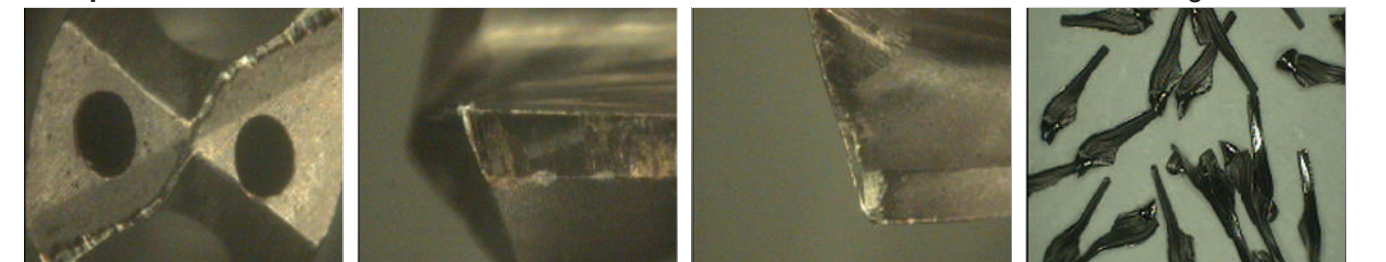
Total Drilling 400 Holes

Competitor A



Total Drilling 400 Holes

Competitor B

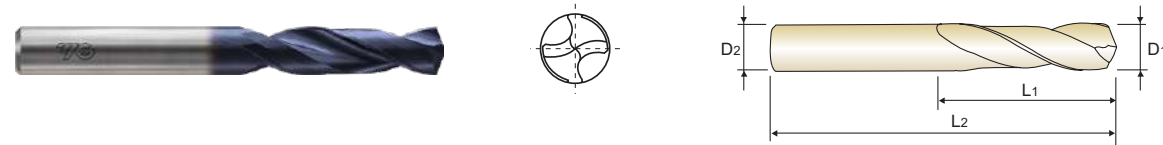


Total Drilling 400 Holes

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (3XD)

DH404 SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



DIN 6539 CARBIDE h6 h7 140° P. 39

STUB
3 x D

EDP No.	Drill Diameter D1=D2	Flute Length L1	Overall Length L2
TiAIN			
DH404030	3.0	16	46
DH404031	3.1	18	49
DH404032	3.2	18	49
DH404033	3.3	18	49
DH404034	3.4	20	52
DH404035	3.5	20	52
DH404036	3.6	20	52
DH404037	3.7	20	52
DH404038	3.8	22	55
DH404039	3.9	22	55
DH404040	4.0	22	55
DH404041	4.1	22	55
DH404042	4.2	22	55
DH404043	4.3	24	58
DH404044	4.4	24	58
DH404045	4.5	24	58
DH404046	4.6	24	58
DH404047	4.7	24	58
DH404048	4.8	26	62
DH404049	4.9	26	62
DH404050	5.0	26	62
DH404051	5.1	26	62
DH404052	5.2	26	62
DH404053	5.3	26	62

Unit : mm

EDP No.	Drill Diameter D1=D2	Flute Length L1	Overall Length L2
TiAIN			
DH404054	5.4	28	66
DH404055	5.5	28	66
DH404056	5.6	28	66
DH404057	5.7	28	66
DH404058	5.8	28	66
DH404059	5.9	28	66
DH404060	6.0	28	66
DH404061	6.1	31	70
DH404062	6.2	31	70
DH404063	6.3	31	70
DH404064	6.4	31	70
DH404065	6.5	31	70
DH404066	6.6	31	70
DH404067	6.7	31	70
DH404068	6.8	34	74
DH404069	6.9	34	74
DH404070	7.0	34	74
DH404071	7.1	34	74
DH404072	7.2	34	74
DH404073	7.3	34	74
DH404074	7.4	34	74
DH404075	7.5	34	74
DH404076	7.6	37	79
DH404077	7.7	37	79

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

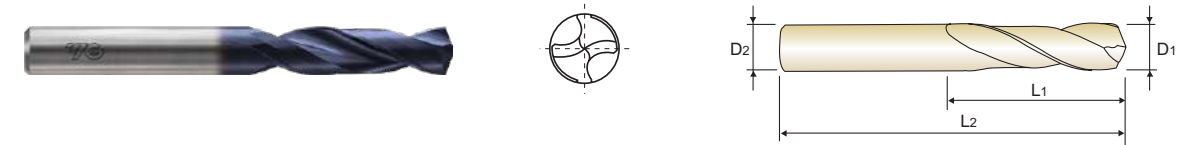
ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron	Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	10	29	32	38	15	11	15	23	10	26	3	25	19	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO Material Description	N										S					H					
	Aluminum- wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (3XD)

DH404 SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



DIN 6539 CARBIDE h6 h7 140° P. 39

STUB
3 x D

Unit : mm

EDP No.	Drill Diameter D1=D2	Flute Length L1	Overall Length L2
TiAIN			
DH404078	7.8	37	79
DH404079	7.9	37	79
DH404080	8.0	37	79
DH404081	8.1	37	79
DH404082	8.2	37	79
DH404083	8.3	37	79
DH404084	8.4	37	79
DH404085	8.5	37	79
DH404086	8.6	40	84
DH404087	8.7	40	84
DH404088	8.8	40	84
DH404089	8.9	40	84
DH404090	9.0	40	84
DH404091	9.1	40	84
DH404092	9.2	40	84
DH404093	9.3	40	84
DH404094	9.4	40	84
DH404095	9.5	40	84
DH404096	9.6	43	89
DH404097	9.7	43	89
DH404098	9.8	43	89
DH404099	9.9	43	89

Unit : mm

EDP No.	Drill Diameter D1=D2	Flute Length L1	Overall Length L2
TiAIN			
DH404100	10.0	43	89
DH404102	10.2	43	89
DH404105	10.5	43	89
DH404110	11.0	47	95
DH404115	11.5	47	95
DH404120	12.0	51	102
DH404130	13.0	51	102
DH404135	13.5	54	107
DH404140	14.0	54	107
DH404145	14.5	56	111
DH404150	15.0	56	111
DH404155	15.5	58	115
DH404160	16.0	58	115
DH404165	16.5	60	119
DH404170	17.0	60	119
DH404175	17.5	62	123
DH404180	18.0	62	123
DH404185	18.5	64	127
DH404190	19.0	64	127
DH404195	19.5	66	131
DH404200	20.0	66	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

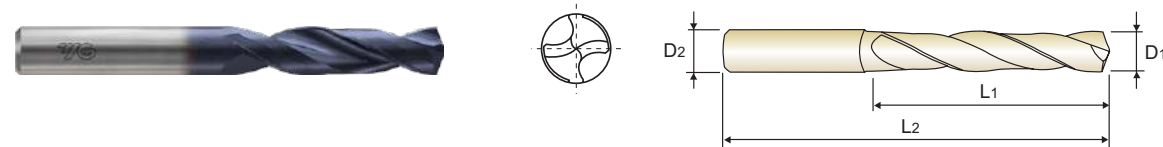
ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron	Nodular cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	10	29	32	38	15	11	15	23	10	26	3	25	19	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO Material Description	N										S					H					
	Aluminum- wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (3XD)

PLAIN SHANK **DH423** SERIES
FLAT SHANK **DH443** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



SHORT
3 x D

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423030	DH443030	3.0	6	20	62
DH423031	DH443031	3.1	6	20	62
DH423032	DH443032	3.2	6	20	62
DH423033	DH443033	3.3	6	20	62
DH423034	DH443034	3.4	6	20	62
DH423035	DH443035	3.5	6	20	62
DH423036	DH443036	3.6	6	20	62
DH423037	DH443037	3.7	6	20	62
DH423038	DH443038	3.8	6	24	66
DH423039	DH443039	3.9	6	24	66
DH423040	DH443040	4.0	6	24	66
DH423041	DH443041	4.1	6	24	66
DH423042	DH443042	4.2	6	24	66
DH423043	DH443043	4.3	6	24	66
DH423044	DH443044	4.4	6	24	66
DH423045	DH443045	4.5	6	24	66
DH423046	DH443046	4.6	6	24	66
DH423047	DH443047	4.7	6	24	66
DH423048	DH443048	4.8	6	28	66
DH423049	DH443049	4.9	6	28	66
DH423050	DH443050	5.0	6	28	66
DH423051	DH443051	5.1	6	28	66
DH423052	DH443052	5.2	6	28	66
DH423053	DH443053	5.3	6	28	66

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423054	DH443054	5.4	6	28	66
DH423055	DH443055	5.5	6	28	66
DH423056	DH443056	5.6	6	28	66
DH423057	DH443057	5.7	6	28	66
DH423058	DH443058	5.8	6	28	66
DH423059	DH443059	5.9	6	28	66
DH423060	DH443060	6.0	6	28	66
DH423061	DH443061	6.1	8	34	79
DH423062	DH443062	6.2	8	34	79
DH423063	DH443063	6.3	8	34	79
DH423064	DH443064	6.4	8	34	79
DH423065	DH443065	6.5	8	34	79
DH423066	DH443066	6.6	8	34	79
DH423067	DH443067	6.7	8	34	79
DH423068	DH443068	6.8	8	34	79
DH423069	DH443069	6.9	8	34	79
DH423070	DH443070	7.0	8	34	79
DH423071	DH443071	7.1	8	41	79
DH423072	DH443072	7.2	8	41	79
DH423073	DH443073	7.3	8	41	79
DH423074	DH443074	7.4	8	41	79
DH423075	DH443075	7.5	8	41	79
DH423076	DH443076	7.6	8	41	79
DH423077	DH443077	7.7	8	41	79

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

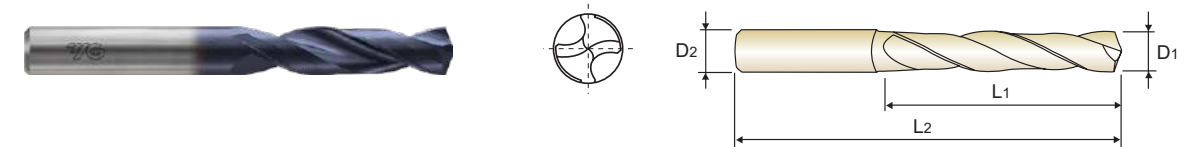
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (3XD)

PLAIN SHANK **DH423** SERIES
FLAT SHANK **DH443** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



SHORT
3 x D

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423078	DH443078	7.8	8	41	79
DH423079	DH443079	7.9	8	41	79
DH423080	DH443080	8.0	8	41	79
DH423081	DH443081	8.1	10	47	89
DH423082	DH443082	8.2	10	47	89
DH423083	DH443083	8.3	10	47	89
DH423084	DH443084	8.4	10	47	89
DH423085	DH443085	8.5	10	47	89
DH423086	DH443086	8.6	10	47	89
DH423087	DH443087	8.7	10	47	89
DH423088	DH443088	8.8	10	47	89
DH423089	DH443089	8.9	10	47	89
DH423090	DH443090	9.0	10	47	89
DH423091	DH443091	9.1	10	47	89
DH423092	DH443092	9.2	10	47	89
DH423093	DH443093	9.3	10	47	89
DH423094	DH443094	9.4	10	47	89
DH423095	DH443095	9.5	10	47	89
DH423096	DH443096	9.6	10	47	89
DH423097	DH443097	9.7	10	47	89
DH423098	DH443098	9.8	10	47	89
DH423099	DH443099	9.9	10	47	89
DH423100	DH443100	10.0	10	47	89
DH423101	DH443101	10.1	12	55	102

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423102	DH443102	10.2	12	55	102
DH423103	DH443103	10.3	12	55	102
DH423104	DH443104	10.4	12	55	102
DH423105	DH443105	10.5	12	55	102
DH423106	DH443106	10.6	12	55	102
DH423107	DH443107	10.7	12	55	102
DH423108	DH443108	10.8	12	55	102
DH423109	DH443109	10.9	12	55	102
DH423110	DH443110	11.0	12	55	102
DH423111	DH443111	11.1	12	55	102
DH423112	DH443112	11.2	12	55	102
DH423113	DH443113	11.3	12	55	102
DH423114	DH443114	11.4	12	55	102
DH423115	DH443115	11.5	12	55	102
DH423116	DH443116	11.6	12	55	102
DH423117	DH443117	11.7	12	55	102
DH423118	DH443118	11.8	12	55	102
DH423119	DH443119	11.9	12	55	102
DH423120	DH443120	12.0	12	55	102
DH423123	DH443123	12.3	14	60	107
DH423125	DH443125	12.5	14	60	107
DH423128	DH443128	12.8	14	60	107
DH423130	DH443130	13.0	14	60	107
DH423135	DH443135	13.5	14	60	107

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

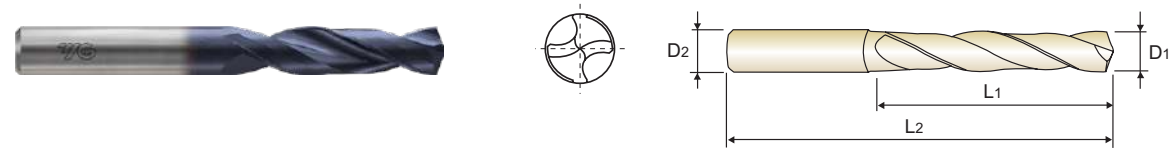
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S				H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (3XD)

PLAIN SHANK **DH423** SERIES
FLAT SHANK **DH443** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



SHORT
3 × D

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423138	DH443138	13.8	14	60	107
DH423140	DH443140	14.0	14	60	107
DH423145	DH443145	14.5	16	65	115
DH423148	DH443148	14.8	16	65	115
DH423150	DH443150	15.0	16	65	115
DH423155	DH443155	15.5	16	65	115
DH423158	DH443158	15.8	16	65	115
DH423160	DH443160	16.0	16	65	115
DH423165	DH443165	16.5	18	73	123
DH423168	DH443168	16.8	18	73	123

▶ Other shank types are available on your request.

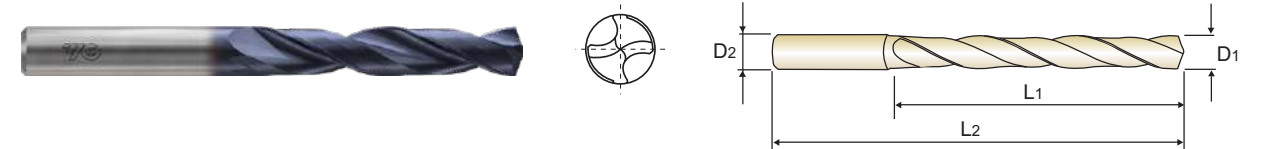
Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH423170	DH443170	17.0	18	73	123
DH423175	DH443175	17.5	18	73	123
DH423178	DH443178	17.8	18	73	123
DH423180	DH443180	18.0	18	73	123
DH423185	DH443185	18.5	20	79	131
DH423190	DH443190	19.0	20	79	131
DH423195	DH443195	19.5	20	79	131
DH423198	DH443198	19.8	20	79	131
DH423200	DH443200	20.0	20	79	131

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (5XD)

PLAIN SHANK **DH424** SERIES
FLAT SHANK **DH444** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



LONG
5 × D

Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424010	-	1.0	3	8	55
DH424011	-	1.1	3	12	55
DH424012	-	1.2	3	12	55
DH424013	-	1.3	3	12	55
DH424014	-	1.4	3	12	55
DH424015	-	1.5	3	16	55
DH424016	-	1.6	3	16	55
DH424017	-	1.7	3	16	55
DH424018	-	1.8	3	16	55
DH424019	-	1.9	3	16	55
DH424020	-	2.0	4	21	57
DH424021	-	2.1	4	21	57
DH424022	-	2.2	4	21	57
DH424023	-	2.3	4	21	57
DH424024	-	2.4	4	21	57
DH424025	-	2.5	4	21	57
DH424026	-	2.6	4	21	57
DH424027	-	2.7	4	21	57
DH424028	-	2.8	4	21	57
DH424029	-	2.9	4	21	57
DH424030	DH444030	3.0	6	28	66
DH424031	DH444031	3.1	6	28	66
DH424032	DH444032	3.2	6	28	66
DH424033	DH444033	3.3	6	28	66

▶ Other shank types are available on your request.

Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424034	DH444034	3.4	6	28	66
DH424035	DH444035	3.5	6	28	66
DH424036	DH444036	3.6	6	28	66
DH424037	DH444037	3.7	6	28	66
DH424038	DH444038	3.8	6	36	74
DH424039	DH444039	3.9	6	36	74
DH424040	DH444040	4.0	6	36	74
DH424041	DH444041	4.1	6	36	74
DH424042	DH444042	4.2	6	36	74
DH424043	DH444043	4.3	6	36	74
DH424044	DH444044	4.4	6	36	74
DH424045	DH444045	4.5	6	36	74
DH424046	DH444046	4.6	6	36	74
DH424047	DH444047	4.7	6	36	74
DH424048	DH444048	4.8	6	44	82
DH424049	DH444049	4.9	6	44	82
DH424050	DH444050	5.0	6	44	82
DH424051	DH444051	5.1	6	44	82
DH424052	DH444052	5.2	6	44	82
DH424053	DH444053	5.3	6	44	82
DH424054	DH444054	5.4	6	44	82
DH424055	DH444055	5.5	6	44	82
DH424056	DH444056	5.6	6	44	82
DH424057	DH444057	5.7	6	44	82

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	30	29	32	38	35	35	15	15	23	10	10	26	3	25	3	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S				H								
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommended																							

◎ : Excellent ○ : Good

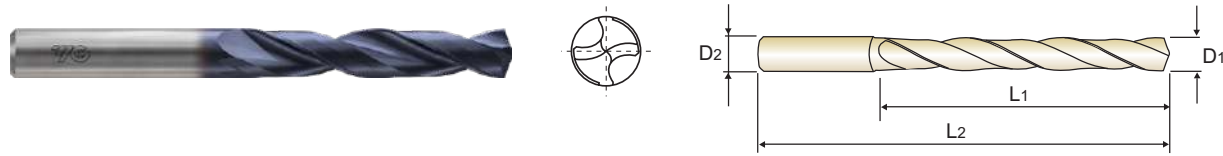
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	30	29	32	38	35	35	15	15	23	10	10	26	3	25	3	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S				H								
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommended																							

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (5XD)

PLAIN SHANK **DH424** SERIES
FLAT SHANK **DH444** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



LONG
5 x D

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424058	DH444058	5.8	6	44	82
DH424059	DH444059	5.9	6	44	82
DH424060	DH444060	6.0	6	44	82
DH424061	DH444061	6.1	8	53	91
DH424062	DH444062	6.2	8	53	91
DH424063	DH444063	6.3	8	53	91
DH424064	DH444064	6.4	8	53	91
DH424065	DH444065	6.5	8	53	91
DH424066	DH444066	6.6	8	53	91
DH424067	DH444067	6.7	8	53	91
DH424068	DH444068	6.8	8	53	91
DH424069	DH444069	6.9	8	53	91
DH424070	DH444070	7.0	8	53	91
DH424071	DH444071	7.1	8	53	91
DH424072	DH444072	7.2	8	53	91
DH424073	DH444073	7.3	8	53	91
DH424074	DH444074	7.4	8	53	91
DH424075	DH444075	7.5	8	53	91
DH424076	DH444076	7.6	8	53	91
DH424077	DH444077	7.7	8	53	91
DH424078	DH444078	7.8	8	53	91
DH424079	DH444079	7.9	8	53	91
DH424080	DH444080	8.0	8	53	91
DH424081	DH444081	8.1	10	61	103

Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424082	DH444082	8.2	10	61	103
DH424083	DH444083	8.3	10	61	103
DH424084	DH444084	8.4	10	61	103
DH424085	DH444085	8.5	10	61	103
DH424086	DH444086	8.6	10	61	103
DH424087	DH444087	8.7	10	61	103
DH424088	DH444088	8.8	10	61	103
DH424089	DH444089	8.9	10	61	103
DH424090	DH444090	9.0	10	61	103
DH424091	DH444091	9.1	10	61	103
DH424092	DH444092	9.2	10	61	103
DH424093	DH444093	9.3	10	61	103
DH424094	DH444094	9.4	10	61	103
DH424095	DH444095	9.5	10	61	103
DH424096	DH444096	9.6	10	61	103
DH424097	DH444097	9.7	10	61	103
DH424098	DH444098	9.8	10	61	103
DH424099	DH444099	9.9	10	61	103
DH424100	DH444100	10.0	10	61	103
DH424101	DH444101	10.1	12	71	118
DH424102	DH444102	10.2	12	71	118
DH424103	DH444103	10.3	12	71	118
DH424104	DH444104	10.4	12	71	118
DH424105	DH444105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC		13	25	28	32	10	29	32	38	10	15	35	15	23	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S				H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	41
HRC											15	30	25	38	34	36	37	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550
Recommended																						

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General without Coolant Holes (5XD)

PLAIN SHANK **DH424** SERIES
FLAT SHANK **DH444** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



LONG
5 x D

Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424106	DH444106	10.6	12	71	118
DH424107	DH444107	10.7	12	71	118
DH424108	DH444108	10.8	12	71	118
DH424109	DH444109	10.9	12	71	118
DH424110	DH444110	11.0	12	71	118
DH424111	DH444111	11.1	12	71	118
DH424112	DH444112	11.2	12	71	118
DH424113	DH444113	11.3	12	71	118
DH424114	DH444114	11.4	12	71	118
DH424115	DH444115	11.5	12	71	118
DH424116	DH444116	11.6	12	71	118
DH424117	DH444117	11.7	12	71	118
DH424118	DH444118	11.8	12	71	118
DH424119	DH444119	11.9	12	71	118
DH424120	DH444120	12.0	12	71	118
DH424125	DH444125	12.5	14	77	124

Unit : mm

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH424130	DH444130	13.0	14	77	124
DH424135	DH444135	13.5	14	77	124
DH424140	DH444140	14.0	14	77	124
DH424145	DH444145	14.5	16	83	133
DH424150	DH444150	15.0	16	83	133
DH424155	DH444155	15.5	16	83	133
DH424160	DH444160	16.0	16	83	133
DH424165	DH444165	16.5	18	93	143
DH424170	DH444170	17.0	18	93	143
DH424175	DH444175	17.5	18	93	143
DH424180	DH444180	18.0	18	93	143
DH424185	DH444185	18.5	20	101	153
DH424190	DH444190	19.0	20	101	153
DH424195	DH444195	19.5	20	101	153
DH424200	DH444200	20.0	20	101	153

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

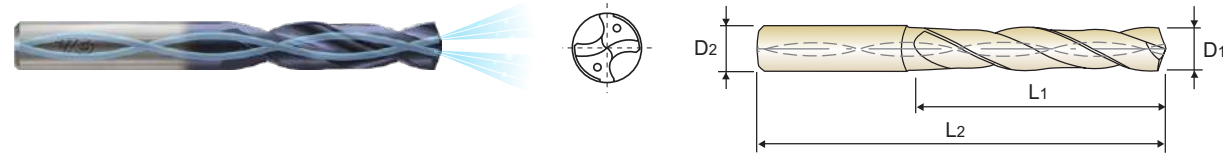
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC		13	25	28	32	10	29	32	38	10	15	35	15	23	10	26	3	25				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S				H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	41
HRC											15	30	25	38	34	36	37	55	60	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550
Recommended																						

TiN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (3XD)

PLAIN SHANK **DH406** SERIES
FLAT SHANK **DH446** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



SHORT
3 x D

EDP No. (TiN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406030	DH446030	3.0	6	20	62
DH406031	DH446031	3.1	6	20	62
DH406032	DH446032	3.2	6	20	62
DH406033	DH446033	3.3	6	20	62
DH406034	DH446034	3.4	6	20	62
DH406035	DH446035	3.5	6	20	62
DH406036	DH446036	3.6	6	20	62
DH406037	DH446037	3.7	6	20	62
DH406038	DH446038	3.8	6	24	66
DH406039	DH446039	3.9	6	24	66
DH406040	DH446040	4.0	6	24	66
DH406041	DH446041	4.1	6	24	66
DH406042	DH446042	4.2	6	24	66
DH406043	DH446043	4.3	6	24	66
DH406044	DH446044	4.4	6	24	66
DH406045	DH446045	4.5	6	24	66
DH406046	DH446046	4.6	6	24	66
DH406047	DH446047	4.7	6	24	66
DH406048	DH446048	4.8	6	28	66
DH406049	DH446049	4.9	6	28	66
DH406050	DH446050	5.0	6	28	66
DH406051	DH446051	5.1	6	28	66
DH406052	DH446052	5.2	6	28	66
DH406053	DH446053	5.3	6	28	66
DH406054	DH446054	5.4	6	28	66
DH406055	DH446055	5.5	6	28	66

EDP No. (TiN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406056	DH446056	5.6	6	28	66
DH406057	DH446057	5.7	6	28	66
DH406058	DH446058	5.8	6	28	66
DH406059	DH446059	5.9	6	28	66
DH406060	DH446060	6.0	6	28	66
DH406061	DH446061	6.1	8	34	79
DH406062	DH446062	6.2	8	34	79
DH406063	DH446063	6.3	8	34	79
DH406064	DH446064	6.4	8	34	79
DH406065	DH446065	6.5	8	34	79
DH406066	DH446066	6.6	8	34	79
DH406067	DH446067	6.7	8	34	79
DH406068	DH446068	6.8	8	34	79
DH406069	DH446069	6.9	8	34	79
DH406070	DH446070	7.0	8	34	79
DH406071	DH446071	7.1	8	41	79
DH406072	DH446072	7.2	8	41	79
DH406073	DH446073	7.3	8	41	79
DH406074	DH446074	7.4	8	41	79
DH406075	DH446075	7.5	8	41	79
DH406076	DH446076	7.6	8	41	79
DH406077	DH446077	7.7	8	41	79
DH406078	DH446078	7.8	8	41	79
DH406079	DH446079	7.9	8	41	79
DH406080	DH446080	8.0	8	41	79
DH406081	DH446081	8.1	10	47	89

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

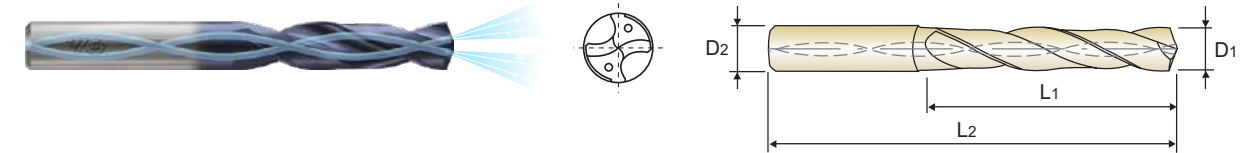
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	10	29	32	38	10	15	11	15	23	10	26	3	25	19	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230			
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			

ISO	N										S				H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

TiN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (3XD)

PLAIN SHANK **DH406** SERIES
FLAT SHANK **DH446** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



SHORT
3 x D

EDP No. (TiN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406082	DH446082	8.2	10	47	89
DH406083	DH446083	8.3	10	47	89
DH406084	DH446084	8.4	10	47	89
DH406085	DH446085	8.5	10	47	89
DH406086	DH446086	8.6	10	47	89
DH406087	DH446087	8.7	10	47	89
DH406088	DH446088	8.8	10	47	89
DH406089	DH446089	8.9	10	47	89
DH406090	DH446090	9.0	10	47	89
DH406091	DH446091	9.1	10	47	89
DH406092	DH446092	9.2	10	47	89
DH406093	DH446093	9.3	10	47	89
DH406094	DH446094	9.4	10	47	89
DH406095	DH446095	9.5	10	47	89
DH406096	DH446096	9.6	10	47	89
DH406097	DH446097	9.7	10	47	89
DH406098	DH446098	9.8	10	47	89
DH406099	DH446099	9.9	10	47	89
DH406100	DH446100	10.0	10	47	89
DH406101	DH446101	10.1	12	55	102
DH406102	DH446102	10.2	12	55	102
DH406103	DH446103	10.3	12	55	102
DH406104	DH446104	10.4	12	55	102
DH406105	DH446105	10.5	12	55	102
DH406106	DH446106	10.6	12	55	102
DH406107	DH446107	10.7	12	55	102
DH406108	DH446108	10.8	12	55	102
DH406109	DH446109	10.9	12	55	102

EDP No. (TiN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406110	DH446110	11.0	12	55	102
DH406111	DH446111	11.1	12	55	102
DH406112	DH446112	11.2	12	55	102
DH406113	DH446113	11.3	12	55	102
DH406114	DH446114	11.4	12	55	102
DH406115	DH446115	11.5	12	55	102
DH406116	DH446116	11.6	12	55	102
DH406117	DH446117	11.7	12	55	102
DH406118	DH446118	11.8	12	55	102
DH406119	DH446119	11.9	12	55	102
DH406120	DH446120	12.0	12	55	102
DH406125	DH446125	12.5	14	60	107
DH406130	DH446130	13.0	14	60	107
DH406135	DH446135	13.5	14	60	107
DH406140	DH446140	14.0	14	60	107
DH406145	DH446145	14.5	16	65	115
DH406150	DH446150	15.0	16	65	115
DH406155	DH446155	15.5	16	65	115
DH406160	DH446160	16.0	16	65	115
DH406165	DH446165	16.5	18	73	123
DH406170	DH446170	17.0	18	73	123
DH406175	DH446175	17.5	18	73	123
DH406180	DH446180	18.0	18	73	123
DH406185	DH446185	18.5	20	79	131
DH406190	DH446190	19.0	20	79	131
DH406195	DH446195	19.5	20	79	131
DH406200	DH446200	20.0	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

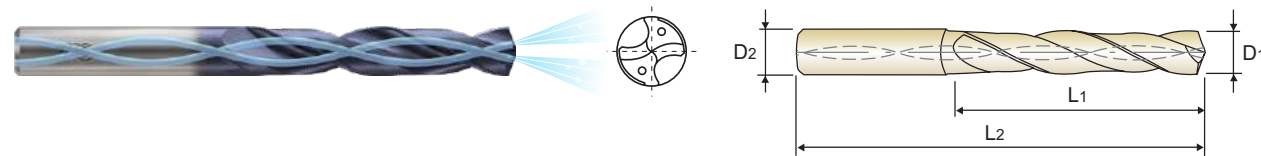
ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	10	29	32	38	10	15	11	15	23	10	26	3	25	19	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230			
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			

ISO	N										S				H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

TiN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (5XD)

PLAIN SHANK **DH408** SERIES
FLAT SHANK **DH448** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



LONG
5 x D

EDP No. (TiN)	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DH408010	1.0	3	8	55	
DH408011	1.1	3	12	55	
DH408012	1.2	3	12	55	
DH408013	1.3	3	12	55	
DH408014	1.4	3	12	55	
DH408015	1.5	3	16	55	
DH408016	1.6	3	16	55	
DH408017	1.7	3	16	55	
DH408018	1.8	3	16	55	
DH408019	1.9	3	16	55	
DH408020	2.0	4	21	57	
DH408021	2.1	4	21	57	
DH408022	2.2	4	21	57	
DH408023	2.3	4	21	57	
DH408024	2.4	4	21	57	
DH408025	2.5	4	21	57	
DH408026	2.6	4	21	57	
DH408027	2.7	4	21	57	
DH408028	2.8	4	21	57	
DH408029	2.9	4	21	57	
DH408030	DH448030	3.0	6	28	66
DH408031	DH448031	3.1	6	28	66
DH408032	DH448032	3.2	6	28	66
DH408033	DH448033	3.3	6	28	66

Unit : mm

EDP No. (TiN)	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DH408034	3.4	6	28	66	
DH408035	3.5	6	28	66	
DH408036	3.6	6	28	66	
DH408037	3.7	6	28	66	
DH408038	3.8	6	36	74	
DH408039	3.9	6	36	74	
DH408040	4.0	6	36	74	
DH408041	4.1	6	36	74	
DH408042	4.2	6	36	74	
DH408043	4.3	6	36	74	
DH408044	4.4	6	36	74	
DH408045	4.5	6	36	74	
DH408046	4.6	6	36	74	
DH408047	4.7	6	36	74	
DH408048	4.8	6	44	82	
DH408049	4.9	6	44	82	
DH408050	5.0	6	44	82	
DH408051	5.1	6	44	82	
DH408052	5.2	6	44	82	
DH408053	5.3	6	44	82	
DH408054	5.4	6	44	82	
DH408055	5.5	6	44	82	
DH408056	5.6	6	44	82	
DH408057	5.7	6	44	82	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

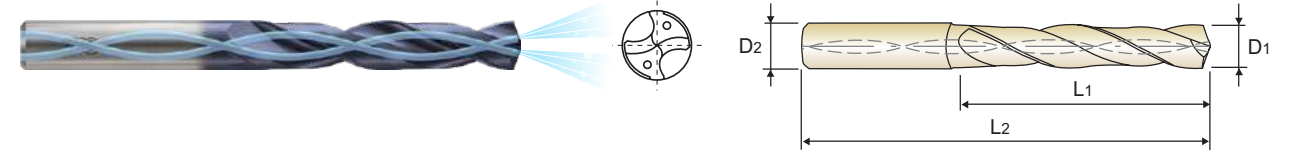
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (5XD)

PLAIN SHANK **DH408** SERIES
FLAT SHANK **DH448** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



LONG
5 x D

Unit : mm

EDP No. (TiN)	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DH408058	5.8	6	44	82	
DH408059	5.9	6	44	82	
DH408060	6.0	6	44	82	
DH408061	6.1	8	53	91	
DH408062	6.2	8	53	91	
DH408063	6.3	8	53	91	
DH408064	6.4	8	53	91	
DH408065	6.5	8	53	91	
DH408066	6.6	8	53	91	
DH408067	6.7	8	53	91	
DH408068	6.8	8	53	91	
DH408069	6.9	8	53	91	
DH408070	7.0	8	53	91	
DH408071	7.1	8	53	91	
DH408072	7.2	8	53	91	
DH408073	7.3	8	53	91	
DH408074	7.4	8	53	91	
DH408075	7.5	8	53	91	
DH408076	7.6	8	53	91	
DH408077	7.7	8	53	91	
DH408078	7.8	8	53	91	
DH408079	7.9	8	53	91	
DH408080	8.0	8	53	91	
DH408081	8.1	10	61	103	

Unit : mm

EDP No. (TiN)	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DH408082	8.2	10	61	103	
DH408083	8.3	10	61	103	
DH408084	8.4	10	61	103	
DH408085	8.5	10	61	103	
DH408086	8.6	10	61	103	
DH408087	8.7	10	61	103	
DH408088	8.8	10	61	103	
DH408089	8.9	10	61	103	
DH408090	9.0	10	61	103	
DH408091	9.1	10	61	103	
DH408092	9.2	10	61	103	
DH408093	9.3	10	61	103	
DH408094	9.4	10	61	103	
DH408095	9.5	10	61	103	
DH408096	9.6	10	61	103	
DH408097	9.7	10	61	103	
DH408098	9.8	10	61	103	
DH408099	9.9	10	61	103	
DH408100	DH448100	10.0	10	61	103
DH408101	DH448101	10.1	12	71	118
DH408102	DH448102	10.2	12	71	118
DH408103	DH448103	10.3	12	71	118
DH408104	DH448104	10.4	12	71	118
DH408105	DH448105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

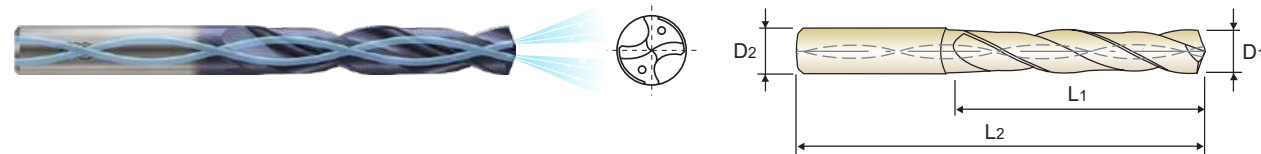
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (5XD)

PLAIN SHANK **DH408** SERIES
FLAT SHANK **DH448** SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



DIN 6537 CARBIDE h6 h6 m7 140° 20 bar P. 40

LONG
5 × D

EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH408106	DH448106	10.6	12	71	118
DH408107	DH448107	10.7	12	71	118
DH408108	DH448108	10.8	12	71	118
DH408109	DH448109	10.9	12	71	118
DH408110	DH448110	11.0	12	71	118
DH408111	DH448111	11.1	12	71	118
DH408112	DH448112	11.2	12	71	118
DH408113	DH448113	11.3	12	71	118
DH408114	DH448114	11.4	12	71	118
DH408115	DH448115	11.5	12	71	118
DH408116	DH448116	11.6	12	71	118
DH408117	DH448117	11.7	12	71	118
DH408118	DH448118	11.8	12	71	118
DH408119	DH448119	11.9	12	71	118
DH408120	DH448120	12.0	12	71	118
DH408125	DH448125	12.5	14	77	124

Unit : mm

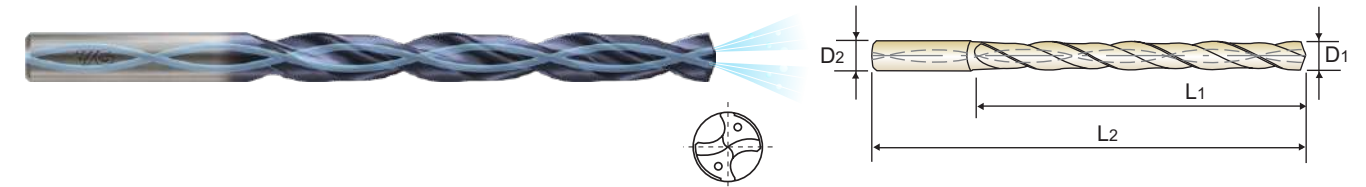
EDP No. (TiAIN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH408130	DH448130	13.0	14	77	124
DH408135	DH448135	13.5	14	77	124
DH408140	DH448140	14.0	14	77	124
DH408145	DH448145	14.5	16	83	133
DH408150	DH448150	15.0	16	83	133
DH408155	DH448155	15.5	16	83	133
DH408160	DH448160	16.0	16	83	133
DH408165	DH448165	16.5	18	93	143
DH408170	DH448170	17.0	18	93	143
DH408175	DH448175	17.5	18	93	143
DH408180	DH448180	18.0	18	93	143
DH408185	DH448185	18.5	20	101	153
DH408190	DH448190	19.0	20	101	153
DH408195	DH448195	19.5	20	101	153
DH408200	DH448200	20.0	20	101	153

▶ Other shank types are available on your request.

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
General with Coolant Holes (8XD)

DH421 SERIES

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-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



DIN 6537 CARBIDE h6 h6 m7 140° 20 bar P. 40

EXTRA LONG
8 × D

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAIN	D1	D2	L1	L2
DH421030	3.0	6	34	72
DH421031	3.1	6	34	72
DH421032	3.2	6	34	72
DH421033	3.3	6	34	72
DH421034	3.4	6	34	72
DH421035	3.5	6	34	72
DH421036	3.6	6	34	72
DH421037	3.7	6	34	72
DH421038	3.8	6	43	81
DH421039	3.9	6	43	81
DH421040	4.0	6	43	81
DH421041	4.1	6	43	81
DH421042	4.2	6	43	81
DH421043	4.3	6	43	81
DH421044	4.4	6	43	81
DH421045	4.5	6	43	81
DH421046	4.6	6	43	81
DH421047	4.7	6	43	81
DH421048	4.8	6	57	95
DH421049	4.9	6	57	95
DH421050	5.0	6	57	95
DH421051	5.1	6	57	95
DH421052	5.2	6	57	95
DH421053	5.3	6	57	95

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAIN	D1	D2	L1	L2
DH421054	5.4	6	57	95
DH421055	5.5	6	57	95
DH421056	5.6	6	57	95
DH421057	5.7	6	57	95
DH421058	5.8	6	57	95
DH421059	5.9	6	57	95
DH421060	6.0	6	57	95
DH421061	6.1	8	76	114
DH421062	6.2	8	76	114
DH421063	6.3	8	76	114
DH421064	6.4	8	76	114
DH421065	6.5	8	76	114
DH421066	6.6	8	76	114
DH421067	6.7	8	76	114
DH421068	6.8	8	76	114
DH421069	6.9	8	76	114
DH421070	7.0	8	76	114
DH421071	7.1	8	76	114
DH421072	7.2	8	76	114
DH421073	7.3	8	76	114
DH421074	7.4	8	76	114
DH421075	7.5	8	76	114
DH421076	7.6	8	76	114
DH421077	7.7	8	76	114

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M					K																									
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel					Grey cast iron					Nodular cast iron					Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	13	25	28	32	30	29	32	38	35	20	32	35	23	10	10	26	3	3	25	21	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	180	260	160	250	130	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550					
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					

ISO	N										S					H																													
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials					Heat Resistant Super Alloys					Titanium Alloys					Hardened steel					Chilled Cast Iron					Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62			
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550																								
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			

◎ : Excellent ○ : Good

ISO	P										M					K																									
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel					Grey cast iron					Nodular cast iron					Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	13	25	28	32	30	29	32	38	35	20	32	35	23	10	10	26	3	3	25	21	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	180	260	160	250	130	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550					
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S					H																													
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials					Heat Resistant Super Alloys					Titanium Alloys					Hardened steel					Chilled Cast Iron					Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62			
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550																								
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			

DH406, DH446, DH408, DH448, DH421 SERIES with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)		Vc	Parameter	Drill Diameter (mm)			
					1.0	2.0			3.0	4.0	5.0	6.0
P	2	Non-alloy steel	80	RPM	25460	12730	110	RPM	11670	8750	7000	5840
			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		
			80	RPM	25460	12730	110	RPM	11670	8750	7000	5840
	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			
	80		RPM	25460	12730	110	RPM	11670	8750	7000	5840	
	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			
	5	RPM	22280	11140	90	RPM	9550	7160	5730	4770		
	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				
	6	RPM	25460	12730	110	RPM	11670	8750	7000	5840		
	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				
	7	Low alloy steel	70	RPM	22280	11140	90	RPM	9550	7160	5730	4770
FEED			0.03-0.05	0.05-0.07	FEED	0.06-0.12	0.08-0.14	0.10-0.20	0.12-0.24			
70			RPM	22280	11140	90	RPM	9550	7160	5730	4770	
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			
9	RPM	12730	6370	50	RPM	5310	3980	3180	2650			
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					
10	High alloyed steel, and tool steel	60	RPM	19100	9550	80	RPM	8490	6370	5090	4240	
		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			
11		40	RPM	12730	6370	45	RPM	4770	3580	2860	2390	
		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			
M	12	Stainless steel	60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
			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		
K	13		45	RPM	14320	7160	55	RPM	5840	4380	3500	2920
			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		
	15	Grey cast iron	80	RPM	25460	12730	110	RPM	11670	8750	7000	5840
			FEED	0.04-0.06	0.04-0.06	FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26		
	16		75	RPM	23870	11940	95	RPM	10080	7560	6050	5040
			FEED	0.04-0.06	0.04-0.06	FEED	0.06-0.12	0.08-0.14	0.14-0.2	0.16-0.22		
	17	Nodular cast iron	90	RPM	28650	14320	120	RPM	12730	9550	7640	6370
			FEED	0.04-0.06	0.04-0.06	FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26		
	18		60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
			FEED	0.04-0.06	0.04-0.06	FEED	0.06-0.12	0.08-0.14	0.14-0.2	0.16-0.22		
19	Malleable cast iron	70	RPM	22280	11140	90	RPM	9550	7160	5730	4770	
		FEED	0.04-0.06	0.04-0.06	FEED	0.08-0.14	0.12-0.18	0.18-0.24	0.14-0.26			
20		60	RPM	19100	9550	80	RPM	8490	6370	5090	4240	
		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			

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)						
					8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	110	RPM	4380	3500	2920	2500	2190	1950	1750
			FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
			110	RPM	4380	3500	2920	2500	2190	1950	1750
	FEED		0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40		
	110		RPM	4380	3500	2920	2500	2190	1950	1750	
	FEED		0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32		
	5	RPM	3580	2860	2390	2050	1790	1590	1430		
	FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32			
	6	Low alloy steel	110	RPM	4380	3500	2920	2500	2190	1950	1750
			FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
			90	RPM	3580	2860	2390	2050	1790	1590	1430
FEED			0.16-0.28	0.20-0.30	0.21-0.30	0.22-0.35	0.25-0.36	0.28-0.38	0.30-0.40		
8	RPM	3580	2860	2390	2050	1790	1590	1430			
FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32				
9	RPM	1990	1590	1330	1140	990	880	800			
FEED	0.12-0.18	0.14-0.20	0.12-0.22	0.13-0.23	0.14-0.24	0.16-0.26	0.18-0.28				
10	High alloyed steel, and tool steel	80	RPM	3180	2550	2120	1820	1590	1410	1270	
		FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32		
11		45	RPM	1790	1430	1190	1020	900	800	720	
		FEED	0.12-0.18	0.14-0.20	0.12-0.22	0.13-0.23	0.14-0.24	0.16-0.26	0.18-0.28		
M	12	Stainless steel	80	RPM	3180	2550	2120	1820	1590	1410	1270
			FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
13		55	RPM	2190	1750	1460	1250	1090	970	880	
		FEED	0.14-0.20	0.18-0.24	0.14-0.24	0.16-0.26	0.18-0.28	0.20-0.30	0.22-0.32		
K	15	Grey cast iron	110	RPM	4380	3500	2920	2500	2190	1950	1750
			FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.3-0.40	0.32-0.42	0.34-0.44	
	16		95	RPM	3780	3020	2520	2160	1890	1680	1510
			FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40	
	17	Nodular cast iron	120	RPM	4770	3820	3180	2730	2390	2120	1910
			FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.30-0.40	0.32-0.42	0.34-0.44	
18		80	RPM	3180	2550	2120	1820	1590	1410	1270	
		FEED	0.18-0.24	0.22-0.28	0.2-0.3	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40		
19	Malleable cast iron	90	RPM	3580	2860	2390	2050	1790	1590	1430	
		FEED	0.16-0.28	0.24-0.34	0.26-0.36	0.28-0.38	0.30-0.40	0.32-0.42	0.34-0.44		
20		80	RPM	3180	2550	2120	1820	1590	1410	1270	
		FEED	0.18-0.24	0.22-0.28	0.20-0.30	0.22-0.32	0.24-0.34	0.28-0.38	0.30-0.40		

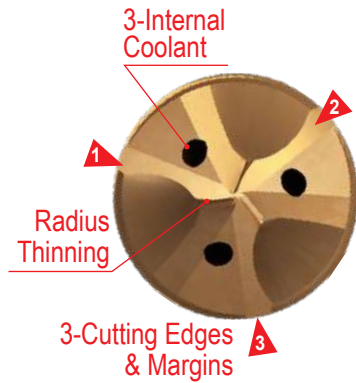
► Recommend to reduce the feed rate as following
Feed 100% : DH406(3×D), DH408(5×D) Feed 75% : DH421(8×D)

SOLID CARBIDE

DREAM DRILLS
HIGH FEED

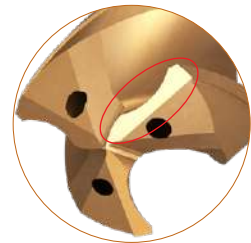
- 1.5 to 2 Times Faster Feeding Speed than 2-Flute Drill
For Carbon Steels, Alloy Steels(up to HRC35) and Cast Iron

DREAM DRILLS HIGH FEED



3-Cutting Edges & Margins will allow high penetration rate, accurate hole location and good surface finish.

Radius Thinning for **Self Centering and Chip Breaking**



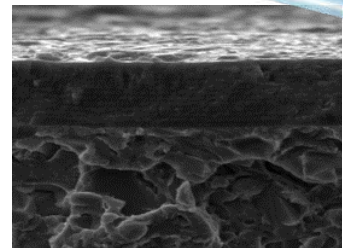
Ground Negative land on cutting edge for Reliable Tool Life

3-Slots on end of shank for smooth and consistent coolant supply

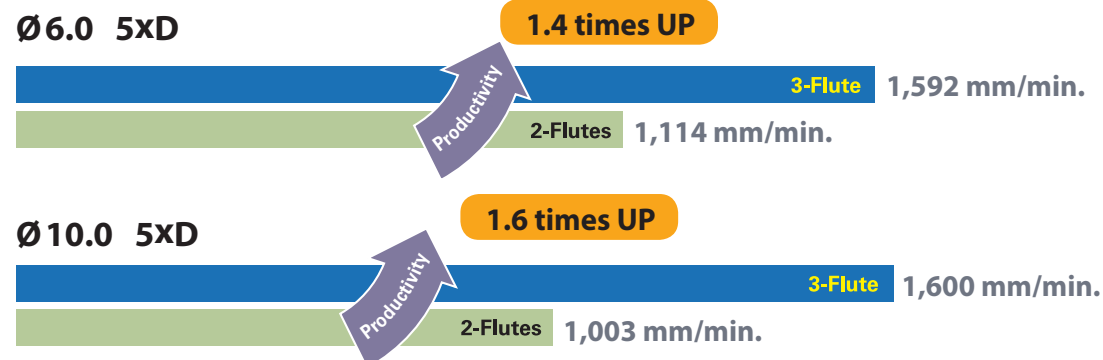


H-Coating
(Upgraded AlCrN-Based : **Multi-Layer coating**)

- Higher worn-out resistance and Lower friction
- Higher Cutting Speed and Feed
- Improved drill Hole Quality



Productivity (Carbon Steel)

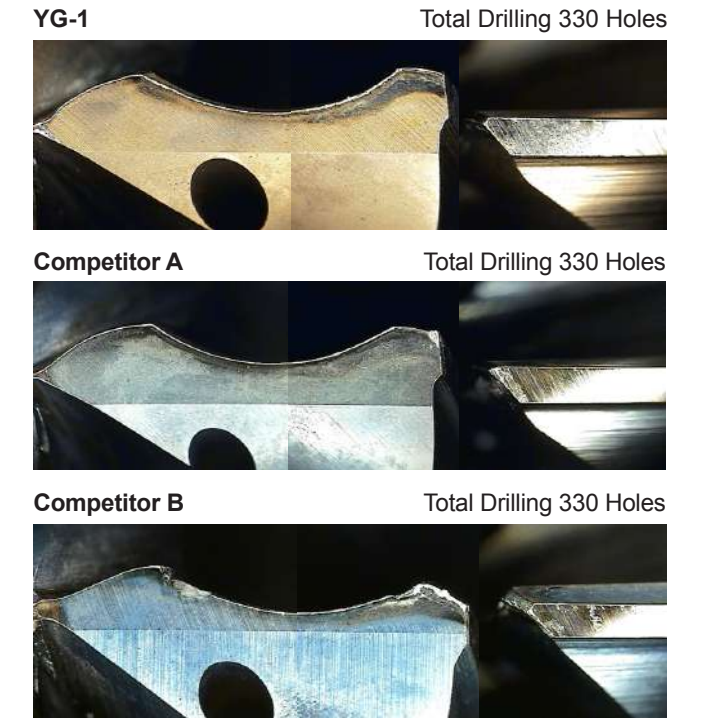


1.5 ~ 2 times Faster in drilling compared to two flute carbide drills

CASE STUDY

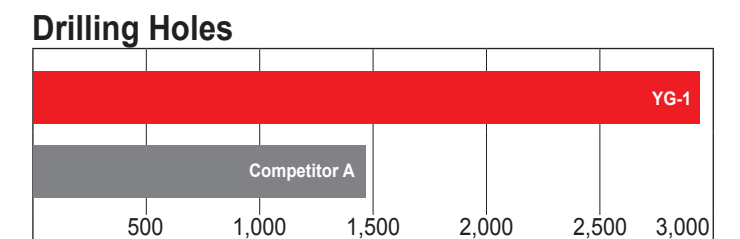
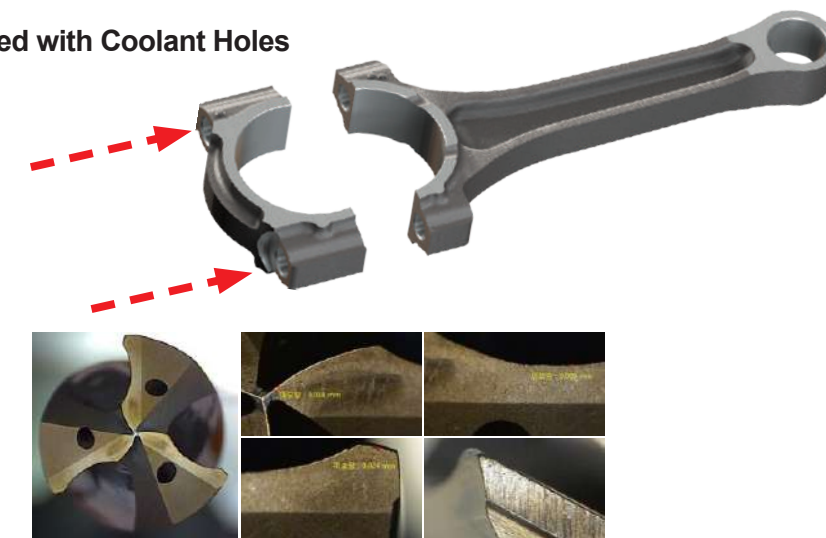
► SOLID CARBIDE DREAM DRILLS - High Feed with Coolant Holes

CUTTING CONDITION	
Tool	DGR495100 (Dream Drills High Feed)
Size	Ø10 x Ø10 x 61 x 103
Work Material	• DIN: C45 • AISI: 1045 • JIS: S45C (HRc20)
RPM	3,200 rev./min.
Feed	0.5 mm/rev.
Drilling Depth	50 mm
Drilling Method	Blind Hole
Coolant	Wet Cut
Machine	Machining Center



► SOLID CARBIDE DREAM DRILLS - High Feed with Coolant Holes

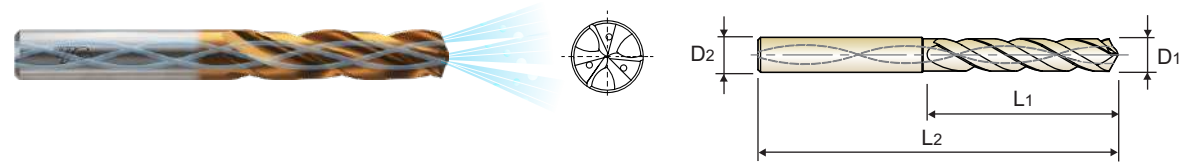
CUTTING CONDITION	
Tool	DGR495080 (Dream Drills High Feed)
Size	Ø8 x Ø8 x 53 x 91
Work Material	Connecting rod
RPM	2,000 rev./min.
Feed	0.23 mm/rev.
Drilling Depth	40.0 mm
Drilling Method	Internal Cooling, Water Soluble
Coolant	Wet Cut
Machine	Machining Center



H-COATED SOLID CARBIDE DREAM DRILLS
High Feed with Coolant Holes (3XD)

DGR493 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels(-HRC35) and Cast Iron
- ▶ Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶ Multi-Layer coating delivers much better productivity and reliability
- ▶ Self centering and chip breaking by R-thinning and coolant holes



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 48

SHORT
3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
H-Coating					
DGR493050	5.0	6	28	66	
DGR493051	5.1	6	28	66	
DGR493052	5.2	6	28	66	
DGR493053	5.3	6	28	66	
DGR493054	5.4	6	28	66	
DGR493055	5.5	6	28	66	
DGR493056	5.6	6	28	66	
DGR493057	5.7	6	28	66	
DGR493058	5.8	6	28	66	
DGR493059	5.9	6	28	66	
DGR493060	6.0	6	28	66	
DGR493061	6.1	8	34	79	
DGR493062	6.2	8	34	79	
DGR493063	6.3	8	34	79	
DGR493064	6.4	8	34	79	
DGR493065	6.5	8	34	79	
DGR493066	6.6	8	34	79	
DGR493067	6.7	8	34	79	
DGR493068	6.8	8	34	79	
DGR493069	6.9	8	34	79	
DGR493070	7.0	8	34	79	
DGR493071	7.1	8	41	79	
DGR493072	7.2	8	41	79	
DGR493073	7.3	8	41	79	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
H-Coating					
DGR493074	7.4	8	41	79	
DGR493075	7.5	8	41	79	
DGR493076	7.6	8	41	79	
DGR493077	7.7	8	41	79	
DGR493078	7.8	8	41	79	
DGR493079	7.9	8	41	79	
DGR493080	8.0	8	41	79	
DGR493081	8.1	10	47	89	
DGR493082	8.2	10	47	89	
DGR493083	8.3	10	47	89	
DGR493084	8.4	10	47	89	
DGR493085	8.5	10	47	89	
DGR493086	8.6	10	47	89	
DGR493087	8.7	10	47	89	
DGR493088	8.8	10	47	89	
DGR493089	8.9	10	47	89	
DGR493090	9.0	10	47	89	
DGR493091	9.1	10	47	89	
DGR493092	9.2	10	47	89	
DGR493093	9.3	10	47	89	
DGR493094	9.4	10	47	89	
DGR493095	9.5	10	47	89	
DGR493096	9.6	10	47	89	
DGR493097	9.7	10	47	89	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

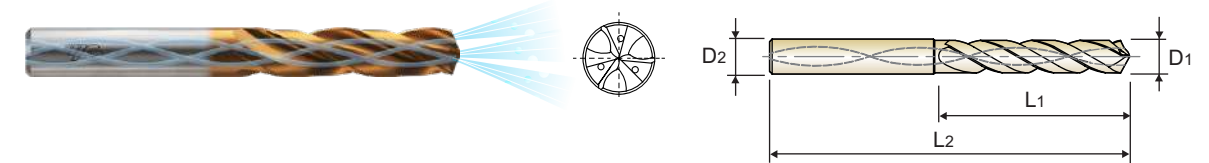
ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68	
HB	125	190	250	270	300	300	325	350	380	410	430	450	470	490	510	530	550	570	590	610	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

H-COATED SOLID CARBIDE DREAM DRILLS
High Feed with Coolant Holes (3XD)

DGR493 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels(-HRC35) and Cast Iron
- ▶ Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶ Multi-Layer coating delivers much better productivity and reliability
- ▶ Self centering and chip breaking by R-thinning and coolant holes



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 48

SHORT
3 x D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
H-Coating					
DGR493098	9.8	10	47	89	
DGR493099	9.9	10	47	89	
DGR493100	10.0	10	47	89	
DGR493101	10.1	12	55	102	
DGR493102	10.2	12	55	102	
DGR493103	10.3	12	55	102	
DGR493104	10.4	12	55	102	
DGR493105	10.5	12	55	102	
DGR493106	10.6	12	55	102	
DGR493107	10.7	12	55	102	
DGR493108	10.8	12	55	102	
DGR493109	10.9	12	55	102	
DGR493110	11.0	12	55	102	
DGR493111	11.1	12	55	102	
DGR493112	11.2	12	55	102	
DGR493113	11.3	12	55	102	
DGR493114	11.4	12	55	102	
DGR493115	11.5	12	55	102	
DGR493116	11.6	12	55	102	
DGR493117	11.7	12	55	102	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
H-Coating					
DGR493118	11.8	12	55	102	
DGR493119	11.9	12	55	102	
DGR493120	12.0	12	55	102	
DGR493125	12.5	14	60	107	
DGR493130	13.0	14	60	107	
DGR493135	13.5	14	60	107	
DGR493140	14.0	14	60	107	
DGR493145	14.5	16	65	115	
DGR493150	15.0	16	65	115	
DGR493155	15.5	16	65	115	
DGR493160	16.0	16	65	115	
DGR493165	16.5	18	73	123	
DGR493170	17.0	18	73	123	
DGR493175	17.5	18	73	123	
DGR493180	18.0	18	73	123	
DGR493185	18.5	20	79	131	
DGR493190	19.0	20	79	131	
DGR493195	19.5	20	79	131	
DGR493200	20.0	20	79	131	

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

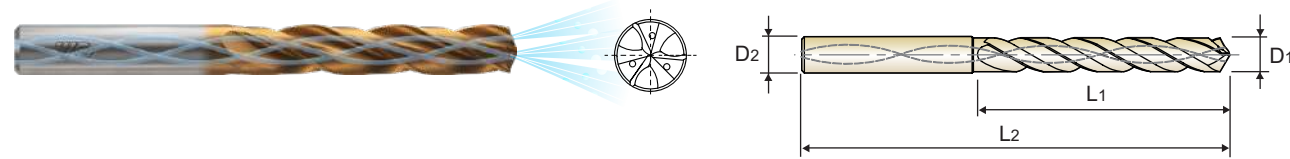
ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68	
HB	125	190	250	270	300	300	325	350	380	410	430	450	470	490	510	530	550	570	590	610	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

H-COATED SOLID CARBIDE DREAM DRILLS
High Feed with Coolant Holes (5XD)

DGR495 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels(-HRC35) and Cast Iron
- ▶ Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶ Multi-Layer coating delivers much better productivity and reliability
- ▶ Self centering and chip breaking by R-thinning and coolant holes



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 48

LONG
5 × D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DGR495050	5.0	6	44	82	
DGR495051	5.1	6	44	82	
DGR495052	5.2	6	44	82	
DGR495053	5.3	6	44	82	
DGR495054	5.4	6	44	82	
DGR495055	5.5	6	44	82	
DGR495056	5.6	6	44	82	
DGR495057	5.7	6	44	82	
DGR495058	5.8	6	44	82	
DGR495059	5.9	6	44	82	
DGR495060	6.0	6	44	82	
DGR495061	6.1	8	53	91	
DGR495062	6.2	8	53	91	
DGR495063	6.3	8	53	91	
DGR495064	6.4	8	53	91	
DGR495065	6.5	8	53	91	
DGR495066	6.6	8	53	91	
DGR495067	6.7	8	53	91	
DGR495068	6.8	8	53	91	
DGR495069	6.9	8	53	91	
DGR495070	7.0	8	53	91	
DGR495071	7.1	8	53	91	
DGR495072	7.2	8	53	91	
DGR495073	7.3	8	53	91	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DGR495074	7.4	8	53	91	
DGR495075	7.5	8	53	91	
DGR495076	7.6	8	53	91	
DGR495077	7.7	8	53	91	
DGR495078	7.8	8	53	91	
DGR495079	7.9	8	53	91	
DGR495080	8.0	8	53	91	
DGR495081	8.1	10	61	103	
DGR495082	8.2	10	61	103	
DGR495083	8.3	10	61	103	
DGR495084	8.4	10	61	103	
DGR495085	8.5	10	61	103	
DGR495086	8.6	10	61	103	
DGR495087	8.7	10	61	103	
DGR495088	8.8	10	61	103	
DGR495089	8.9	10	61	103	
DGR495090	9.0	10	61	103	
DGR495091	9.1	10	61	103	
DGR495092	9.2	10	61	103	
DGR495093	9.3	10	61	103	
DGR495094	9.4	10	61	103	
DGR495095	9.5	10	61	103	
DGR495096	9.6	10	61	103	
DGR495097	9.7	10	61	103	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

H-COATED SOLID CARBIDE DREAM DRILLS
High Feed with Coolant Holes (5XD)

DGR495 SERIES

- ▶ Drilling for Carbon Steels, Alloy Steels(-HRC35) and Cast Iron
- ▶ Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶ Multi-Layer coating delivers much better productivity and reliability
- ▶ Self centering and chip breaking by R-thinning and coolant holes



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 48

LONG
5 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DGR495098	9.8	10	61	103	
DGR495099	9.9	10	61	103	
DGR495100	10.0	10	61	103	
DGR495101	10.1	12	71	118	
DGR495102	10.2	12	71	118	
DGR495103	10.3	12	71	118	
DGR495104	10.4	12	71	118	
DGR495105	10.5	12	71	118	
DGR495106	10.6	12	71	118	
DGR495107	10.7	12	71	118	
DGR495108	10.8	12	71	118	
DGR495109	10.9	12	71	118	
DGR495110	11.0	12	71	118	
DGR495111	11.1	12	71	118	
DGR495112	11.2	12	71	118	
DGR495113	11.3	12	71	118	
DGR495114	11.4	12	71	118	
DGR495115	11.5	12	71	118	
DGR495116	11.6	12	71	118	
DGR495117	11.7	12	71	118	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
DGR495118	11.8	12	71	118	
DGR495119	11.9	12	71	118	
DGR495120	12.0	12	71	118	
DGR495125	12.5	14	77	124	
DGR495130	13.0	14	77	124	
DGR495135	13.5	14	77	124	
DGR495140	14.0	14	77	124	
DGR495145	14.5	16	83	133	
DGR495150	15.0	16	83	133	
DGR495155	15.5	16	83	133	
DGR495160	16.0	16	83	133	
DGR495165	16.5	18	93	143	
DGR495170	17.0	18	93	143	
DGR495175	17.5	18	93	143	
DGR495180	18.0	18	93	143	
DGR495185	18.5	20	101	153	
DGR495190	19.0	20	101	153	
DGR495195	19.5	20	101	153	
DGR495200	20.0	20	101	153	

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					



Leading Through Innovation

DGR493, DGR495 SERIES with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)									
					5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
P	2	Non-alloy steel	100	RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590	
				FEED	0.2-0.25	0.24-0.3	0.32-0.4	0.4-0.5	0.48-0.6	0.56-0.7	0.56-0.72	0.63-0.81	0.7-0.88	
			100	RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590	
	FEED			0.2-0.25	0.24-0.3	0.32-0.4	0.4-0.5	0.48-0.6	0.56-0.7	0.56-0.72	0.63-0.81	0.7-0.88		
	100		RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590		
			FEED	0.16-0.21	0.2-0.26	0.26-0.34	0.34-0.42	0.41-0.47	0.47-0.54	0.47-0.55	0.5-0.59	0.54-0.67		
	80	RPM	5090	4240	3180	2550	2120	1820	1590	1410	1270			
		FEED	0.16-0.21	0.2-0.26	0.26-0.34	0.34-0.42	0.41-0.47	0.47-0.54	0.47-0.55	0.5-0.59	0.54-0.67			
	6	100	Low alloy steel	RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590	
				FEED	0.2-0.25	0.24-0.3	0.32-0.4	0.4-0.5	0.48-0.54	0.56-0.63	0.56-0.64	0.63-0.72	0.68-0.81	
		80		RPM	5090	4240	3180	2550	2120	1820	1590	1410	1270	
FEED				0.2-0.25	0.24-0.3	0.32-0.4	0.4-0.5	0.48-0.54	0.56-0.63	0.56-0.64	0.63-0.72	0.68-0.81		
80	RPM	5090		4240	3180	2550	2120	1820	1590	1410	1270			
	FEED	0.16-0.21		0.2-0.26	0.26-0.34	0.34-0.42	0.41-0.47	0.47-0.54	0.47-0.55	0.5-0.59	0.54-0.67			
40	RPM	2550	2120	1590	1270	1060	910	800	710	640				
	FEED	0.13-0.18	0.16-0.22	0.21-0.29	0.26-0.36	0.32-0.38	0.36-0.43	0.36-0.45	0.38-0.47	0.41-0.54				
10	High alloyed steel, and tool steel	70	RPM	4460	3710	2790	2230	1860	1590	1390	1240	1110		
			FEED	0.16-0.21	0.2-0.26	0.26-0.34	0.34-0.42	0.41-0.47	0.47-0.54	0.47-0.55	0.5-0.59	0.54-0.67		
40		RPM	2550	2120	1590	1270	1060	910	800	710	640			
		FEED	0.13-0.18	0.16-0.22	0.21-0.29	0.26-0.36	0.32-0.38	0.36-0.43	0.36-0.45	0.38-0.47	0.41-0.54			
K		15	Grey cast iron	100	RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590
					FEED	0.23-0.30	0.27-0.36	0.36-0.48	0.45-0.60	0.54-0.72	0.63-0.84	0.64-0.80	0.72-0.90	0.80-0.98
	80	RPM	5090	4240	3180	2550	2120	1820	1590	1410	1270			
		FEED	0.20-0.25	0.24-0.30	0.32-0.40	0.40-0.50	0.48-0.60	0.56-0.70	0.56-0.72	0.63-0.81	0.70-0.90			
	100	Nodular cast iron	RPM	6370	5310	3980	3180	2650	2270	1990	1770	1590		
			FEED	0.23-0.30	0.27-0.36	0.36-0.48	0.45-0.60	0.54-0.72	0.63-0.84	0.64-0.80	0.72-0.90	0.80-0.98		
70	RPM	4460	3710	2790	2230	1860	1590	1390	1240	1110				
	FEED	0.20-0.25	0.24-0.30	0.32-0.40	0.40-0.50	0.48-0.60	0.56-0.70	0.56-0.72	0.63-0.81	0.70-0.90				
80	Malleable cast iron	RPM	5090	4240	3180	2550	2120	1820	1590	1410	1270			
		FEED	0.23-0.30	0.27-0.36	0.36-0.48	0.45-0.60	0.54-0.72	0.63-0.84	0.64-0.80	0.72-0.90	0.80-0.98			
70	RPM	4460	3710	2790	2230	1860	1590	1390	1240	1110				
	FEED	0.20-0.25	0.24-0.30	0.32-0.40	0.40-0.50	0.48-0.60	0.56-0.70	0.56-0.72	0.63-0.81	0.70-0.90				



SOLID CARBIDE

DREAM DRILLS FLAT BOTTOM

- For Holes on Various Angled Surfaces

DREAM DRILLS FLAT BOTTOM

2XD

- No Chamfer
- X-Coating
- Point Angle 180 Degree
- Wider chip space for smooth evacuation

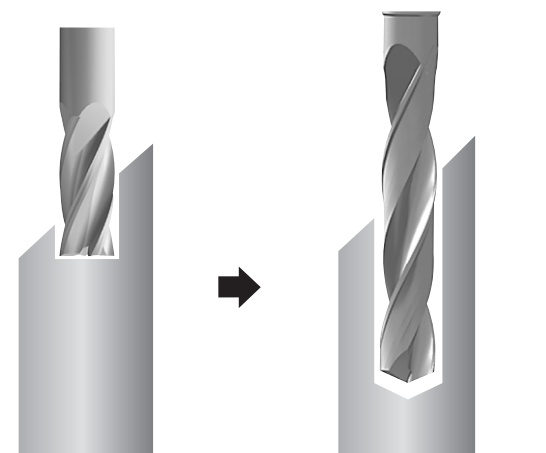
5XD

- Point Angle 180 Degree
- Coating TiAlN nano Layer
- Chamfer (Below data)
- Honing
- Double Margin (2xD Single Margin) Hole straightness and roundness provides good alignments
- Internal Cooling Holes (2xD - No coolant Holes)

O.D.(mm)		5xD Corner Chamfer Length(mm)
Above	Up to	
Ø3	Ø6	0.06
Ø6	Ø10	0.12
Ø10	Ø14	0.18
Ø14	Ø20	0.26

Only One Operation for Angled Surface

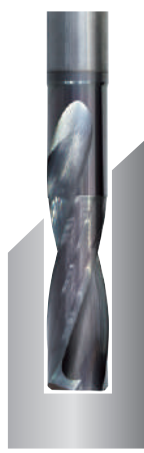
For angled surfaces, two operations are required to drill in a conventional Process



1st operation(End mill)
Counter boring to make flat surface and guide hole

2nd operation(Drill)
Drilling to required depth of hole

For angled surfaces, only one operation can complete the drilling with Dream Drill Flat Bottom

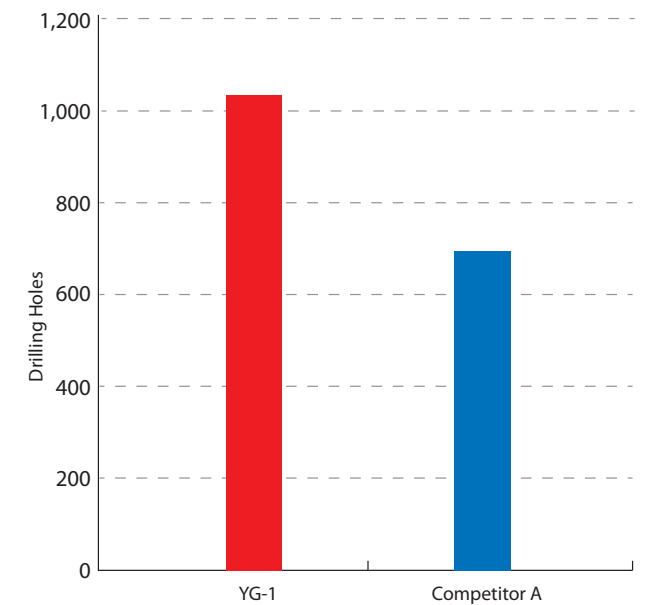
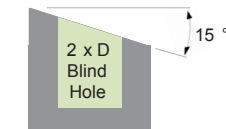


One operation(Dream Drill Flat Bottom)
One Drill does it all without using both an end mill and a drill

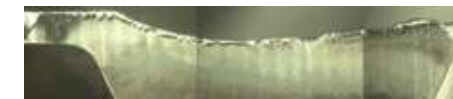
CASE STUDY

► SOLID CARBIDE DREAM DRILLS - Flat Bottom without Coolant Holes

CUTTING CONDITION	
Drill Diameter (mm)	Ø6.0
Work Material	• DIN: C45 • AISI: 1045 • JIS: S45C (HRc20)
Cutting Speed	75.4 m/min
RPM	4,000 rev/min
Feed	0.1 mm/rev
Drilling Depth	12.0 mm (2XD) Blind Hole / without Pecking
Coolant	External Cooling Water Soluble (9% Emulsion)
Machine	Machining Center



YG-1



Small Chipping

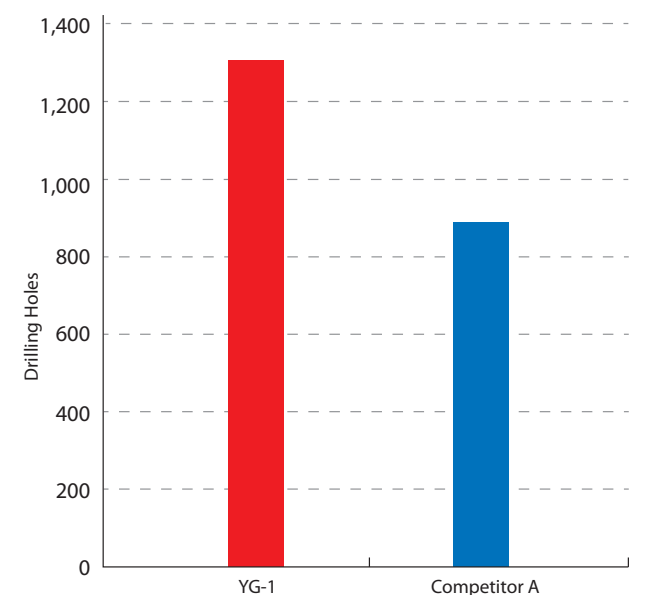
Competitor A



Big Chipping

► SOLID CARBIDE DREAM DRILLS - Flat Bottom with Coolant Holes

CUTTING CONDITION	
Drill Diameter (mm)	Ø6.0
Work Material	• DIN: 42CrMo4 • AISI: 4140 • JIS: SCM440 (HRc30)
Cutting Speed	100.0 m/min
RPM	5,300 rev/min
Feed	0.12 mm/rev
Drilling Depth	Pilot Drill- 6.0mm (1XD) Total depth- 30.0 mm (5XD) Through Hole / without Pecking
Coolant	Internal Cooling Water Soluble (9% Emulsion)
Machine	Machining Center



► YG-1



Small Chipping

► Competitor A

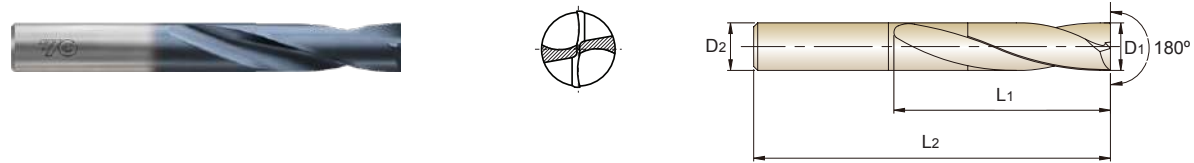


Big Chipping

X-COATED SOLID CARBIDE DREAM DRILLS
Flat Bottom without Coolant Holes (2XD)

DPP447 SERIES

- ▶ For holes on various angled surfaces.
- ▶ 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- ▶ Optimized flute shape for excellent chip evacuation.
- ▶ High strength cutting edge to improve tool life and versatility drilling.
- ▶ For through holes, minimized burrs at entrance and exit when drilling thin plate.



SHORT
2 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
X-Coating					
DPP447030	3.0	6	16		50
DPP447031	3.1	6	16		50
DPP447032	3.2	6	16		50
DPP447033	3.3	6	16		50
DPP447034	3.4	6	18		50
DPP447035	3.5	6	18		50
DPP447036	3.6	6	18		50
DPP447037	3.7	6	18		50
DPP447038	3.8	6	18		50
DPP447039	3.9	6	18		50
DPP447040	4.0	6	18		50
DPP447041	4.1	6	20		60
DPP447042	4.2	6	20		60
DPP447043	4.3	6	20		60
DPP447044	4.4	6	20		60
DPP447045	4.5	6	22		60
DPP447046	4.6	6	22		60
DPP447047	4.7	6	22		60
DPP447048	4.8	6	22		60
DPP447049	4.9	6	22		60
DPP447050	5.0	6	22		60
DPP447051	5.1	6	24		60
DPP447052	5.2	6	24		60
DPP447053	5.3	6	24		60
DPP447054	5.4	6	24		60
DPP447055	5.5	6	24		60

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
X-Coating					
DPP447056	5.6	6	24		60
DPP447057	5.7	6	26		60
DPP447058	5.8	6	26		60
DPP447059	5.9	6	26		60
DPP447060	6.0	6	26		60
DPP447061	6.1	8	28		70
DPP447062	6.2	8	28		70
DPP447063	6.3	8	28		70
DPP447064	6.4	8	30		70
DPP447065	6.5	8	30		70
DPP447066	6.6	8	30		70
DPP447067	6.7	8	30		70
DPP447068	6.8	8	30		70
DPP447069	6.9	8	30		70
DPP447070	7.0	8	30		70
DPP447071	7.1	8	34		70
DPP447072	7.2	8	34		70
DPP447073	7.3	8	34		70
DPP447074	7.4	8	34		70
DPP447075	7.5	8	34		70
DPP447076	7.6	8	34		70
DPP447077	7.7	8	34		70
DPP447078	7.8	8	34		70
DPP447079	7.9	8	34		70
DPP447080	8.0	8	34		70
DPP447081	8.1	10	38		80

▶ Other diameters and shank types are available upon request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

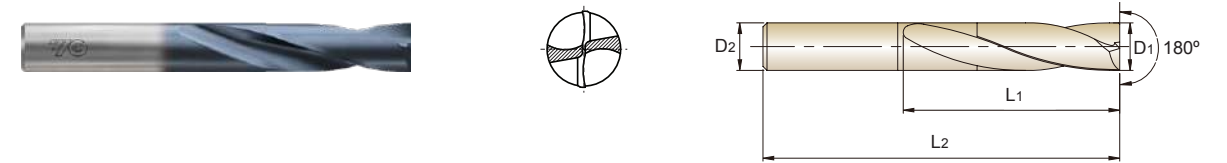
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	◎	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○																			

X-COATED SOLID CARBIDE DREAM DRILLS
Flat Bottom without Coolant Holes (2XD)

DPP447 SERIES

- ▶ For holes on various angled surfaces.
- ▶ 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- ▶ Optimized flute shape for excellent chip evacuation.
- ▶ High strength cutting edge to improve tool life and versatility drilling.
- ▶ For through holes, minimized burrs at entrance and exit when drilling thin plate.



SHORT
2 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
X-Coating					
DPP447082	8.2	10	38		80
DPP447083	8.3	10	38		80
DPP447084	8.4	10	38		80
DPP447085	8.5	10	38		80
DPP447086	8.6	10	38		80
DPP447087	8.7	10	40		80
DPP447088	8.8	10	40		80
DPP447089	8.9	10	40		80
DPP447090	9.0	10	40		80
DPP447091	9.1	10	42		80
DPP447092	9.2	10	42		80
DPP447093	9.3	10	42		80
DPP447094	9.4	10	42		80
DPP447095	9.5	10	42		80
DPP447096	9.6	10	42		80
DPP447097	9.7	10	45		80
DPP447098	9.8	10	45		80
DPP447099	9.9	10	45		80
DPP447100	10.0	10	45		80
DPP447101	10.1	12	46		90
DPP447102	10.2	12	46		90
DPP447103	10.3	12	46		90
DPP447104	10.4	12	48		90
DPP447105	10.5	12	48		90
DPP447106	10.6	12	48		90
DPP447107	10.7	12	48		90
DPP447108	10.8	12	48		90
DPP447109	10.9	12	48		90

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
X-Coating					
DPP447110	11.0	12	48		90
DPP447111	11.1	12	50		90
DPP447112	11.2	12	50		90
DPP447113	11.3	12	50		90
DPP447114	11.4	12	50		90
DPP447115	11.5	12	50		90
DPP447116	11.6	12	50		90
DPP447117	11.7	12	52		90
DPP447118	11.8	12	52		90
DPP447119	11.9	12	52		90
DPP447120	12.0	12	52		90
DPP447125	12.5	14	54		100
DPP447130	13.0	14	56		100
DPP447135	13.5	14	58		100
DPP447140	14.0	14	58		100
DPP447145	14.5	16	62		105
DPP447150	15.0	16	62		105
DPP447155	15.5	16	64		115
DPP447160	16.0	16	64		115
DPP447165	16.5	18	70		125
DPP447170	17.0	18	70		125
DPP447175	17.5	18	70		125
DPP447180	18.0	18	70		125
DPP447185	18.5	20	75		135
DPP447190	19.0	20	75		135
DPP447195	19.5	20	75		145
DPP447200	20.0	20	75		145

▶ Other diameters and shank types are available upon request.

◎ : Excellent ○ : Good

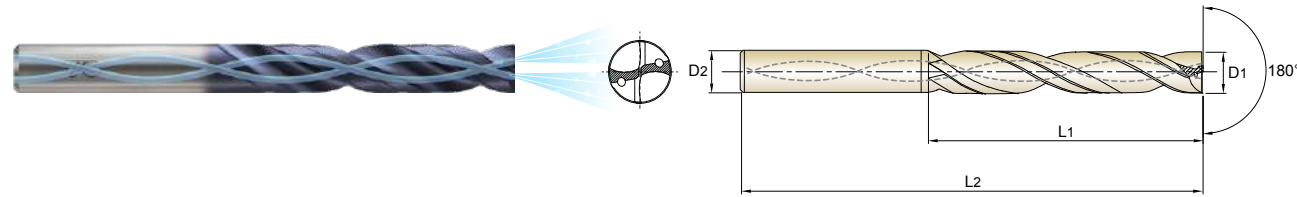
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	◎	○	○	○	○	○

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○																			

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
Flat Bottom with Coolant Holes (5XD)

DH450 SERIES

- ▶ For holes on various angled surfaces.
- ▶ 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- ▶ Optimized flute shape for excellent chip evacuation.
- ▶ High strength cutting edge to improve tool life and versatility drilling.
- ▶ For through holes, minimized burrs at entrance and exit when drilling thin plate.
- ▶ CARBIDE, DREAM DRILLS - FLAT BOTTOM with Coolant Holes
- ▶ Pilot Drilling for 5XD



LONG
5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH450030	3.0	6	28		66
DH450031	3.1	6	28		66
DH450032	3.2	6	28		66
DH450033	3.3	6	28		66
DH450034	3.4	6	28		66
DH450035	3.5	6	28		66
DH450036	3.6	6	28		66
DH450037	3.7	6	28		66
DH450038	3.8	6	36		74
DH450039	3.9	6	36		74
DH450040	4.0	6	36		74
DH450041	4.1	6	36		74
DH450042	4.2	6	36		74
DH450043	4.3	6	36		74
DH450044	4.4	6	36		74
DH450045	4.5	6	36		74
DH450046	4.6	6	36		74
DH450047	4.7	6	36		74
DH450048	4.8	6	44		82
DH450049	4.9	6	44		82
DH450050	5.0	6	44		82
DH450051	5.1	6	44		82
DH450052	5.2	6	44		82
DH450053	5.3	6	44		82
DH450054	5.4	6	44		82
DH450055	5.5	6	44		82

▶ Other diameters and shank types are available upon request.

▶ NEXT PAGE

Unit : mm

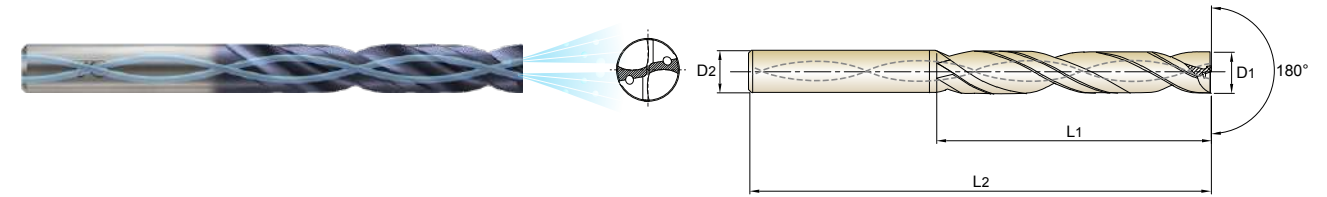
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	12	13	25	28	32	10	29	32	38	15	15	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

ISO Material Description	N					S					H										
	Aluminum- wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	60	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
Flat Bottom with Coolant Holes (5XD)

DH450 SERIES

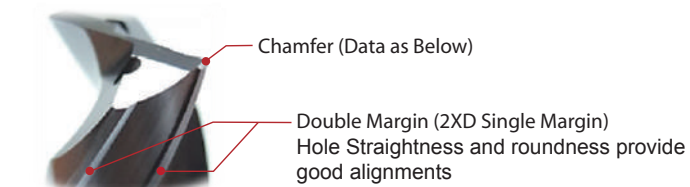
- ▶ For holes on various angled surfaces.
- ▶ 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- ▶ Optimized flute shape for excellent chip evacuation.
- ▶ High strength cutting edge to improve tool life and versatility drilling.
- ▶ For through holes, minimized burrs at entrance and exit when drilling thin plate.
- ▶ CARBIDE, DREAM DRILLS - FLAT BOTTOM with Coolant Holes
- ▶ Pilot Drilling for 5XD



LONG
5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH450082	8.2	10	61		103
DH450083	8.3	10	61		103
DH450084	8.4	10	61		103
DH450085	8.5	10	61		103
DH450086	8.6	10	61		103
DH450087	8.7	10	61		103
DH450088	8.8	10	61		103
DH450089	8.9	10	61		103
DH450090	9.0	10	61		103
DH450091	9.1	10	61		103
DH450092	9.2	10	61		103
DH450093	9.3	10	61		103
DH450094	9.4	10	61		103
DH450095	9.5	10	61		103
DH450096	9.6	10	61		103
DH450097	9.7	10	61		103
DH450098	9.8	10	61		103
DH450099	9.9	10	61		103
DH450100	10.0	10	61		103
DH450102	10.2	12	71		118
DH450105	10.5	12	71		118
DH450108	10.8	12	71		118

▶ Other diameters and shank types are available upon request.



Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH450110	11.0	12	71		118
DH450115	11.5	12	71		118
DH450118	11.8	12	71		118
DH450119	11.9	12	71		118
DH450120	12.0	12	71		118
DH450125	12.5	14	77		124
DH450130	13.0	14	77		124
DH450135	13.5	14	77		124
DH450140	14.0	14	77		124
DH450145	14.5	16	83		133
DH450150	15.0	16	83		133
DH450155	15.5	16	83		133
DH450160	16.0	16	83		133
DH450165	16.5	18	93		143
DH450170	17.0	18	93		143
DH450175	17.5	18	93		143
DH450180	18.0	18	93		143
DH450185	18.5	20	101		153
DH450190	19.0	20	101		153
DH450195	19.5	20	101		153
DH450200	20.0	20	101		153

Drill Diameter (mm)	Corner Chamfer (mm)	
	0.06	0.12
Ø3.0 - Ø6.0	0.06	
Ø6.1 - Ø10.0	0.12	
Ø10.1 - Ø14.0	0.18	
Ø14.1 - Ø20.0	0.26	

⊙ : Excellent ○ : Good

Unit : mm

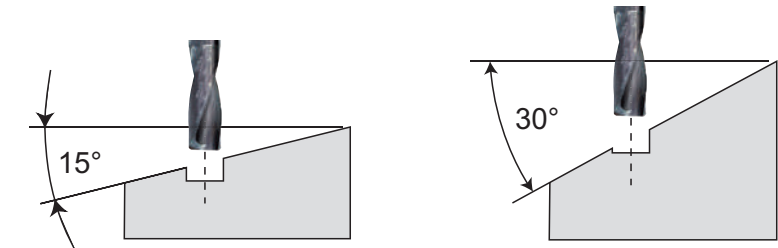
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	12	13	25	28	32	10	29	32	38	15	15	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

ISO Material Description	N					S					H										
	Aluminum- wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys		Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron								
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	60	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

DPP447 SERIES without COOLANT HOLES (2XD)

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

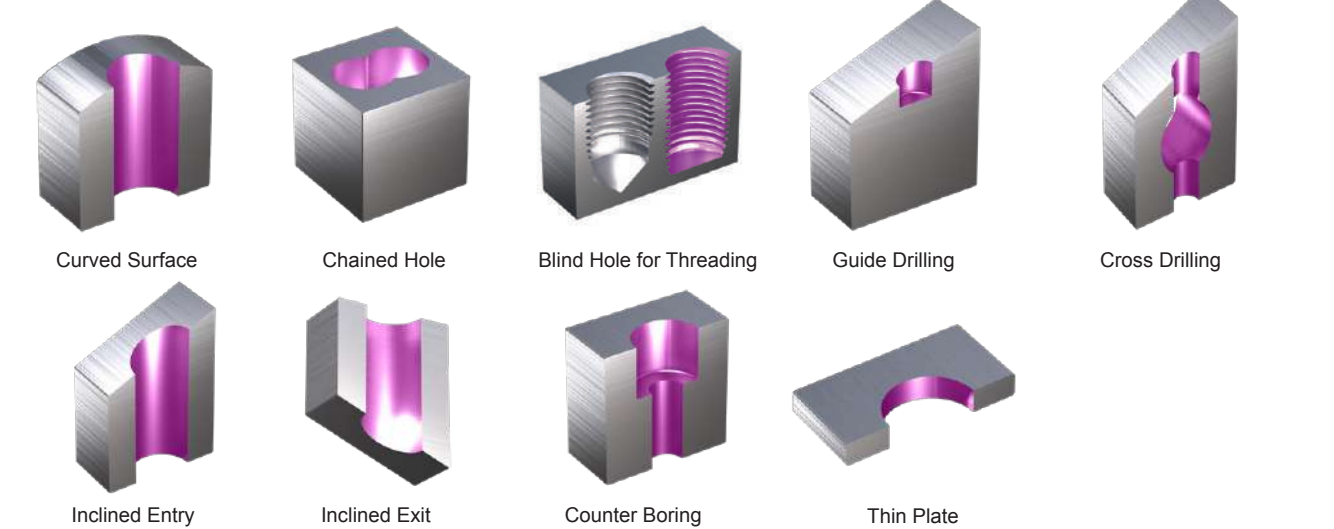
ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)																				
					3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0												
P	1	Non-alloy steel	80	RPM	8490	6370	5090	4240	3180	2550	2120	1590	1270	80	RPM	8490	6370	5090	4240	3180	2550	2120	1590	1270	
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.08-0.14	0.11-0.17	0.11-0.21	0.18-0.28	0.28-0.38		FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.08-0.14	0.11-0.17	0.11-0.21	0.18-0.28	0.28-0.38	
			70	RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110	70	RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110	
	4		FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34	FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34			
	6		Low alloy steel	45	RPM	4770	3580	2860	2390	1790	1430	1190	900	720	45	RPM	4770	3580	2860	2390	1790	1430	1190	900	720
					FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34		FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34
				40	RPM	4240	3180	2550	2120	1590	1270	1060	800	640	40	RPM	4240	3180	2550	2120	1590	1270	1060	800	640
	7			FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34	FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34		
	8			Low alloy steel	38	RPM	4030	3020	2420	2020	1510	1210	1010	760	600	38	RPM	4030	3020	2420	2020	1510	1210	1010	760
FEED		0.02-0.05				0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.21-0.31	FEED	0.02-0.05		0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.21-0.31	
25		RPM			2650	1990	1590	1330	990	800	660	500	400	25	RPM	2650	1990	1590	1330	990	800	660	500	400	
9	FEED	0.01-0.03			0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.06-0.16	0.10-0.20	FEED	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.06-0.16	0.10-0.20			
M	12	Stainless steel			30	RPM	3180	2390	1910	1590	1190	950	800	600	480	30	RPM	3180	2390	1910	1590	1190	950	800	600
			FEED			0.01-0.03	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.09-0.15	FEED		0.01-0.03	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.09-0.15
K	15	Grey cast iron	70		RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110	70	RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110
					FEED	0.02-0.05	0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30		FEED	0.02-0.05	0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30
K	16	Grey cast iron	60		RPM	6370	4770	3820	3180	2390	1910	1590	1190	950	60	RPM	6370	4770	3820	3180	2390	1910	1590	1190	950
				FEED	0.02-0.05	0.02-0.05	0.03-0.06	0.03-0.07	0.04-0.10	0.07-0.13	0.06-0.16	0.11-0.21	0.15-0.25	FEED		0.02-0.05	0.02-0.05	0.03-0.06	0.03-0.07	0.04-0.10	0.07-0.13	0.06-0.16	0.11-0.21	0.15-0.25	
N	21	Aluminum-wrought alloy	165	RPM	17510	13130	10500	8750	6570	5250	4380	3280	2630	165	RPM	17510	13130	10500	8750	6570	5250	4380	3280	2630	
				FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40		FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40	



Surface Angle	Cutting Conditions	
	RPM	FEED
0° - 15°	100%	100%
15° - 30°	100%	50%
30° -	70%	30%

- ▶ The cutting conditions are for 2xD.
- ▶ The rigid and precise machine and holder are required.
- ▶ The recommended depth of hole is measured from the highest point of the hole on drilling in inclined and angled surfaces.
- ▶ The recommended cutting conditions are those for drilling on flat and horizontal surfaces.
- ▶ Please adjust feed rate according to the above surface angle when drilling on an inclined surface.
 - The recommended feed rate 50% or lower, in case of 15°-30° of the incline angle.
 - The recommended feed rate 30% or lower and RPM 70%, in case of 30° - of the incline angle.
- ▶ Please decrease cutting speed as material hardness increases.
- ▶ Only use drilling tool. Side milling, traversing, helical milling are not usable.

VARIETY OF DRILLING



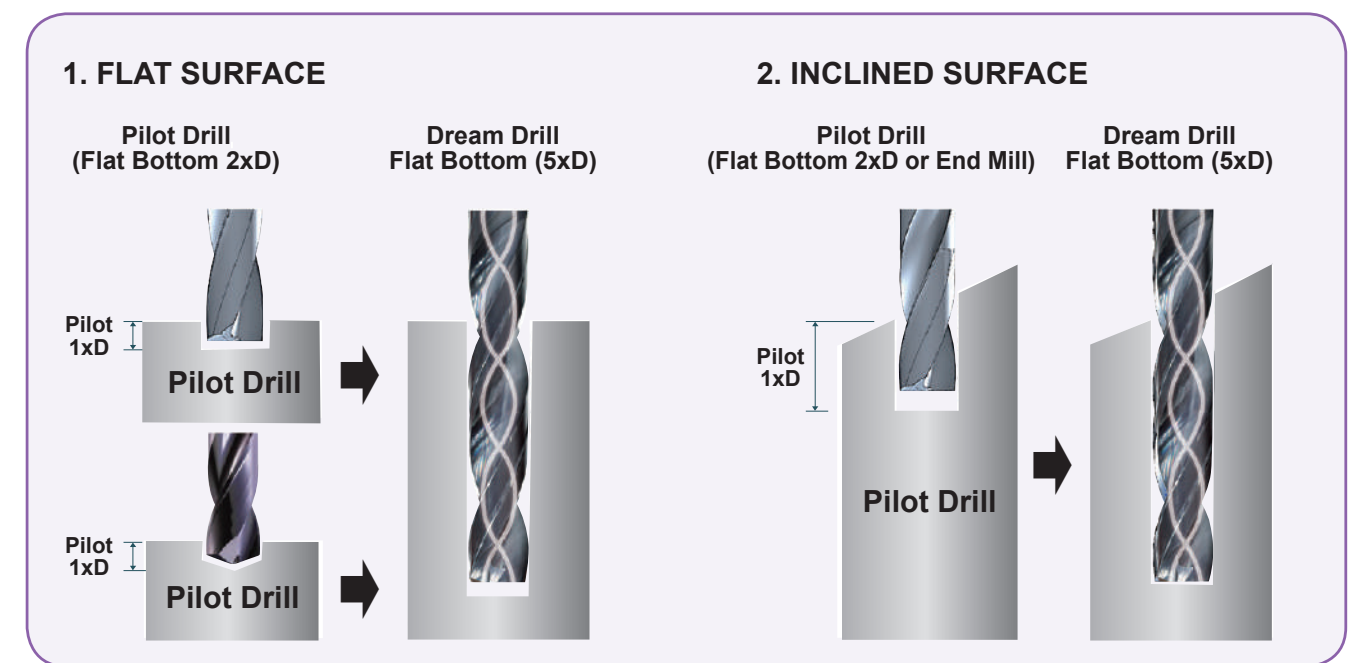
DH450 SERIES with COOLANT HOLES (5XD)

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)																				
					3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0												
P	1	Non-alloy steel	100	RPM	10610	7960	6370	5310	3980	3180	2650	1990	1590	90	RPM	9550	7160	5730	4770	3580	2860	2390	1790	1430	
				FEED	0.05-0.09	0.08-0.12	0.09-0.15	0.12-0.18	0.18-0.24	0.24-0.30	0.26-0.36	0.38-0.48	0.50-0.60		FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40	
			90	RPM	9550	7160	5730	4770	3580	2860	2390	1790	1430	90	RPM	9550	7160	5730	4770	3580	2860	2390	1790	1430	
	4		FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40	FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40			
	6		Low alloy steel	85	RPM	9020	6760	5410	4510	3380	2710	2250	1690	1350	85	RPM	9020	6760	5410	4510	3380	2710	2250	1690	1350
					FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40		FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40
				75	RPM	7960	5970	4770	3980	2980	2390	1990	1490	1190	75	RPM	7960	5970	4770	3980	2980	2390	1990	1490	1190
	7			FEED	0.02-0.04	0.03-0.06	0.05-0.08	0.05-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30	FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40		
	8			Low alloy steel	75	RPM	7960	5970	4770	3980	2980	2390	1990	1490	1190	75	RPM	7960	5970	4770	3980	2980	2390	1990	1490
FEED		0.02-0.04				0.03-0.06	0.05-0.08	0.05-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30	FEED	0.02-0.04		0.03-0.06	0.05-0.08	0.05-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30	
50		RPM			5310	3980	3180	2650	1990	1590	1330	990	800	50	RPM	5310	3980	3180	2650	1990	1590	1330	990	800	
9	FEED	0.02-0.04			0.03-0.06	0.05-0.08	0.05-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30	FEED	0.02-0.04	0.03-0.06	0.05-0.08	0.05-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30			
M	12	Stainless steel			60	RPM	6370	4770	3820	3180	2390	1910	1590	1190	950	60	RPM	6370	4770	3820	3180	2390	1910	1590	1190
			FEED			0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40	FEED		0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40
K	15	Grey cast iron	90		RPM	9550	7160	5730	4770	3580	2860	2390	1790	1430	90	RPM	9550	7160	5730	4770	3580	2860	2390	1790	1430
					FEED	0.02-0.05	0.03-0.06	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40		FEED	0.02-0.05	0.03-0.06	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40
K	16	Grey cast iron	75		RPM	7960	5970	4770	3980	2980	2390	1990	1490	1190	75	RPM	7960	5970	4770	3980	2980	2390	1990	1490	1190
				FEED	0.02-0.05	0.02-0.05	0.03-0.06	0.03-0.07	0.04-0.10	0.07-0.13	0.06-0.16	0.11-0.21	0.15-0.25	FEED		0.02-0.05	0.02-0.05	0.03-0.06	0.03-0.07	0.04-0.10	0.07-0.13	0.06-0.16	0.11-0.21	0.15-0.25	
N	21	Aluminum-wrought alloy	160	RPM	16980	12730	10190	8490	6370	5090	4240	3180	2550	160	RPM	16980	12730	10190	8490	6370	5090	4240	3180	2550	
				FEED	0.05-0.09	0.08-0.12	0.09-0.15	0.12-0.18	0.18-0.24	0.24-0.30	0.26-0.36	0.38-0.48	0.50-0.60		FEED	0.05-0.09	0.08-0.12	0.09-0.15	0.12-0.18	0.18-0.24	0.24-0.30	0.26-0.36	0.38-0.48	0.50-0.60	

- ▶ Required pilot hole of the same diameter before using the 5xD Flat bottom Drills.
- ▶ The above table values is for under 5xD depth with pilot drilling operation.

DREAM DRILLS FLAT BOTTOM - Pilot Drilling for 5 X D



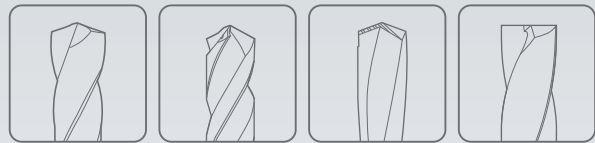
- ▶ For Flat bottom 5xD drilling depth, Slope surface needs Pilot Drilling with YG-1 Flat Bottom Drill (2XD) and Flat surface needs Pilot Drilling with YG-1 Dream Drill General.
- ▶ Pilot Drilling Depth : around 1XD
- ▶ Pilot Drilling Diameter : same size diameter



Leading Through Innovation



Global Cutting Tool Leader **YG-1**



DREAM DRILLS

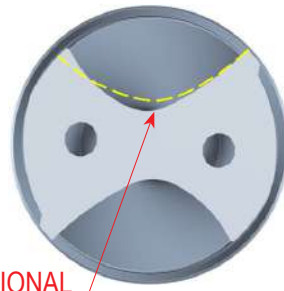
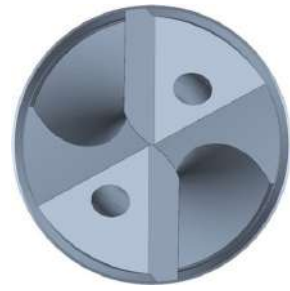


SOLID CARBIDE

DREAM DRILLS INOX

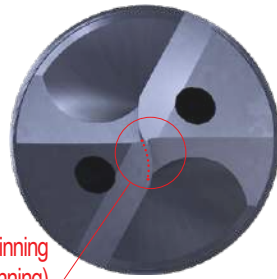
- For Tough Materials like Stainless Steels

DREAM DRILLS INOX



CONVENTIONAL

- Special Flute geometry and Chip pocket to help Chip evacuation and proper Chip Curl.
- strong rigidity from **Cutting Edge**
- high Performance on Stainless Steel and pre hardend Steel



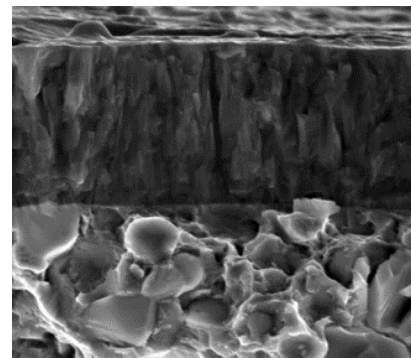
R-Thinning (Radius Thinning)

- Positive Axial **Rake Angle** and cutting force, with **R-Thinning** enhance centering and Chip Breaking.

TiAlN Coating (Upgraded Titanium Aluminum Nitride : nano-Layer coating)

- Higher wear resistance and Lower friction
- Higher Cutting Speed and Feed
- Improved drill Hole Quality

Special surface treatment after coating to reduce friction and better chip flow.



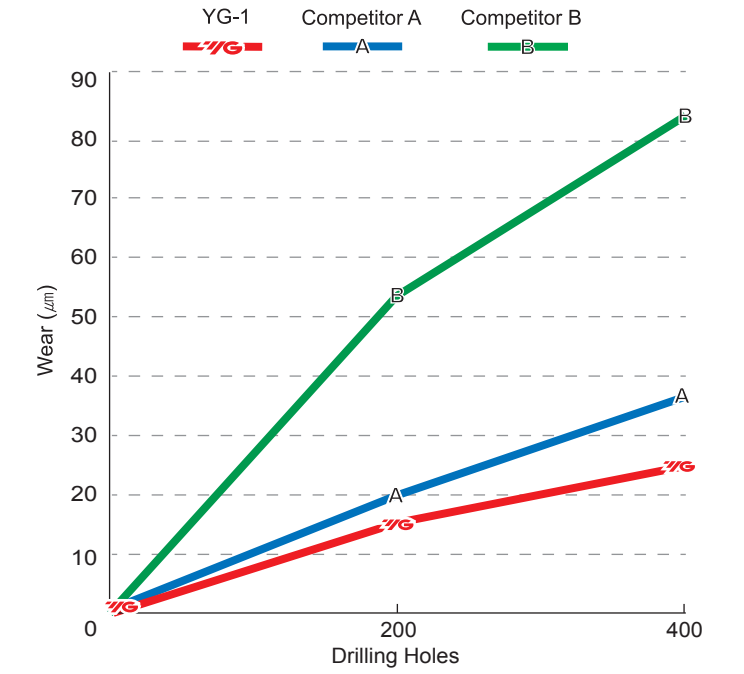
Nano Layer

Carbide

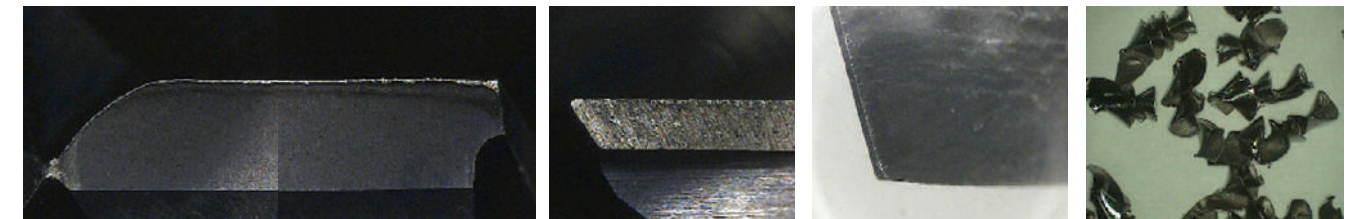
CASE STUDY

► SOLID CARBIDE DREAM DRILLS - INOX with Coolant Holes

CUTTING CONDITION	
Tool	DH452060 (DREAM DRILL-INOX)
Size	Ø6 x Ø6 x 44 x 82
Work Material	• DIN: X5CrNi1810 (X4CrNi18-10) • WR: 1.4301 • JIS: SUS304
RPM	3,700 rev./min.
Feed	0.07 mm/rev.
Drilling Depth	24 mm
Coolant	Wet Cut

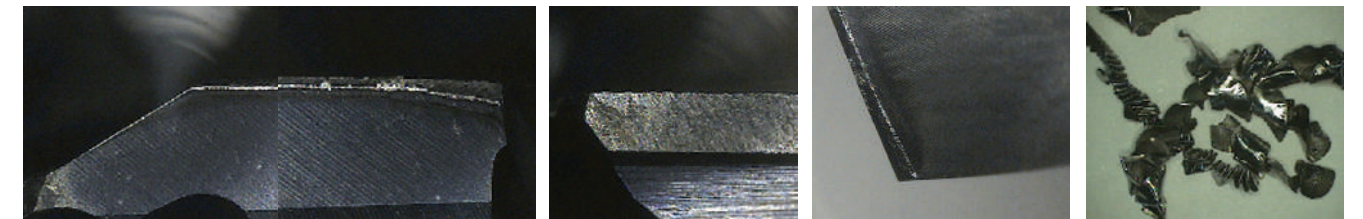


YG-1



Total Drilling 400 Holes

Competitor A



Total Drilling 400 Holes

Competitor B

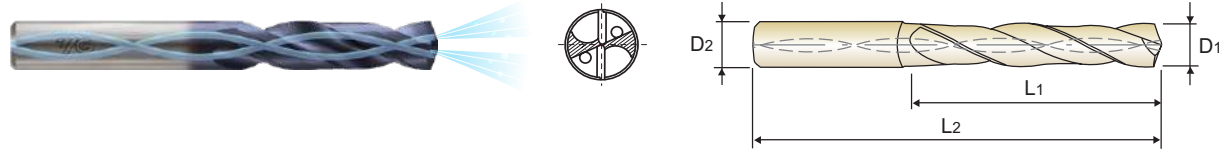


Total Drilling 400 Holes

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
INOX with Coolant Holes (3XD)

DH451 SERIES

- Special flute shape and geometry suitable for machining stainless steel
- Excellent chip evacuation from better surface treatment
- Point R-thinning achieves superior centering and chip curling
- TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

SHORT
3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH451030	3.0	6	20		62
DH451031	3.1	6	20		62
DH451032	3.2	6	20		62
DH451033	3.3	6	20		62
DH451034	3.4	6	20		62
DH451035	3.5	6	20		62
DH451036	3.6	6	20		62
DH451037	3.7	6	20		62
DH451038	3.8	6	24		66
DH451039	3.9	6	24		66
DH451040	4.0	6	24		66
DH451041	4.1	6	24		66
DH451042	4.2	6	24		66
DH451043	4.3	6	24		66
DH451044	4.4	6	24		66
DH451045	4.5	6	24		66
DH451046	4.6	6	24		66
DH451047	4.7	6	24		66
DH451048	4.8	6	28		66
DH451049	4.9	6	28		66
DH451050	5.0	6	28		66
DH451051	5.1	6	28		66
DH451052	5.2	6	28		66
DH451053	5.3	6	28		66
DH451054	5.4	6	28		66
DH451055	5.5	6	28		66

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH451056	5.6	6	28		66
DH451057	5.7	6	28		66
DH451058	5.8	6	28		66
DH451059	5.9	6	28		66
DH451060	6.0	6	28		66
DH451061	6.1	8	34		79
DH451062	6.2	8	34		79
DH451063	6.3	8	34		79
DH451064	6.4	8	34		79
DH451065	6.5	8	34		79
DH451066	6.6	8	34		79
DH451067	6.7	8	34		79
DH451068	6.8	8	34		79
DH451069	6.9	8	34		79
DH451070	7.0	8	34		79
DH451071	7.1	8	41		79
DH451072	7.2	8	41		79
DH451073	7.3	8	41		79
DH451074	7.4	8	41		79
DH451075	7.5	8	41		79
DH451076	7.6	8	41		79
DH451077	7.7	8	41		79
DH451078	7.8	8	41		79
DH451079	7.9	8	41		79
DH451080	8.0	8	41		79
DH451081	8.1	10	47		89

► Other shank types are available on your request.

► NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68	70	72
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HRC	60	60	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
INOX with Coolant Holes (3XD)

DH451 SERIES

- Special flute shape and geometry suitable for machining stainless steel
- Excellent chip evacuation from better surface treatment
- Point R-thinning achieves superior centering and chip curling
- TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

SHORT
3 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH451082	8.2	10	47		89
DH451083	8.3	10	47		89
DH451084	8.4	10	47		89
DH451085	8.5	10	47		89
DH451086	8.6	10	47		89
DH451087	8.7	10	47		89
DH451088	8.8	10	47		89
DH451089	8.9	10	47		89
DH451090	9.0	10	47		89
DH451091	9.1	10	47		89
DH451092	9.2	10	47		89
DH451093	9.3	10	47		89
DH451094	9.4	10	47		89
DH451095	9.5	10	47		89
DH451096	9.6	10	47		89
DH451097	9.7	10	47		89
DH451098	9.8	10	47		89
DH451099	9.9	10	47		89
DH451100	10.0	10	47		89
DH451101	10.1	12	55		102
DH451102	10.2	12	55		102
DH451103	10.3	12	55		102
DH451104	10.4	12	55		102
DH451105	10.5	12	55		102
DH451106	10.6	12	55		102
DH451107	10.7	12	55		102
DH451108	10.8	12	55		102
DH451109	10.9	12	55		102

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length	
				L1	L2
TiAIN					
DH451110	11.0	12	55		102
DH451111	11.1	12	55		102
DH451112	11.2	12	55		102
DH451113	11.3	12	55		102
DH451114	11.4	12	55		102
DH451115	11.5	12	55		102
DH451116	11.6	12	55		102
DH451117	11.7	12	55		102
DH451118	11.8	12	55		102
DH451119	11.9	12	55		102
DH451120	12.0	12	55		102
DH451125	12.5	14	60		107
DH451130	13.0	14	60		107
DH451135	13.5	14	60		107
DH451140	14.0	14	60		107
DH451145	14.5	16	65		115
DH451150	15.0	16	65		115
DH451155	15.5	16	65		115
DH451160	16.0	16	65		115
DH451165	16.5	18	73		123
DH451170	17.0	18	73		123
DH451175	17.5	18	73		123
DH451180	18.0	18	73		123
DH451185	18.5	20	79		131
DH451190	19.0	20	79		131
DH451195	19.5	20	79		131
DH451200	20.0	20	79		131

► Other shank types are available on your request.

◎ : Excellent ○ : Good

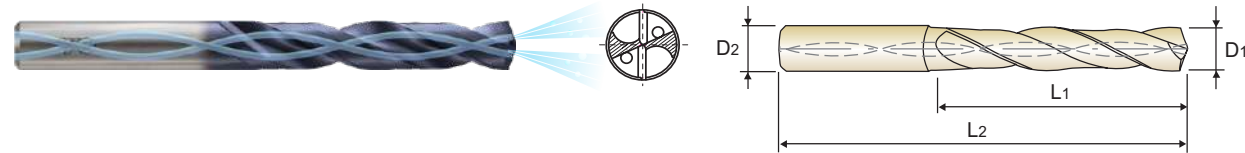
ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68	70	72
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HRC	60	60	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS INOX with Coolant Holes (5XD)

DH452 SERIES

- ▶ Special flute shape and geometry suitable for machining stainless steel
- ▶ Excellent chip evacuation from better surface treatment
- ▶ Point R-thinning achieves superior centering and chip curling
- ▶ TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

LONG 5 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452010	1.0	3	8	55	
DH452011	1.1	3	12	55	
DH452012	1.2	3	12	55	
DH452013	1.3	3	12	55	
DH452014	1.4	3	12	55	
DH452015	1.5	3	16	55	
DH452016	1.6	3	16	55	
DH452017	1.7	3	16	55	
DH452018	1.8	3	16	55	
DH452019	1.9	3	16	55	
DH452020	2.0	4	21	57	
DH452021	2.1	4	21	57	
DH452022	2.2	4	21	57	
DH452023	2.3	4	21	57	
DH452024	2.4	4	21	57	
DH452025	2.5	4	21	57	
DH452026	2.6	4	21	57	
DH452027	2.7	4	21	57	
DH452028	2.8	4	21	57	
DH452029	2.9	4	21	57	
DH452030	3.0	6	28	66	
DH452031	3.1	6	28	66	
DH452032	3.2	6	28	66	
DH452033	3.3	6	28	66	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452034	3.4	6	28	66	
DH452035	3.5	6	28	66	
DH452036	3.6	6	28	66	
DH452037	3.7	6	28	66	
DH452038	3.8	6	36	74	
DH452039	3.9	6	36	74	
DH452040	4.0	6	36	74	
DH452041	4.1	6	36	74	
DH452042	4.2	6	36	74	
DH452043	4.3	6	36	74	
DH452044	4.4	6	36	74	
DH452045	4.5	6	36	74	
DH452046	4.6	6	36	74	
DH452047	4.7	6	36	74	
DH452048	4.8	6	44	82	
DH452049	4.9	6	44	82	
DH452050	5.0	6	44	82	
DH452051	5.1	6	44	82	
DH452052	5.2	6	44	82	
DH452053	5.3	6	44	82	
DH452054	5.4	6	44	82	
DH452055	5.5	6	44	82	
DH452056	5.6	6	44	82	
DH452057	5.7	6	44	82	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	10	29	32	38	10	15	15	23	10	10	26	3	25	21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS INOX with Coolant Holes (5XD)

DH452 SERIES

- ▶ Special flute shape and geometry suitable for machining stainless steel
- ▶ Excellent chip evacuation from better surface treatment
- ▶ Point R-thinning achieves superior centering and chip curling
- ▶ TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

LONG 5 x D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452058	5.8	6	44	82	
DH452059	5.9	6	44	82	
DH452060	6.0	6	44	82	
DH452061	6.1	8	53	91	
DH452062	6.2	8	53	91	
DH452063	6.3	8	53	91	
DH452064	6.4	8	53	91	
DH452065	6.5	8	53	91	
DH452066	6.6	8	53	91	
DH452067	6.7	8	53	91	
DH452068	6.8	8	53	91	
DH452069	6.9	8	53	91	
DH452070	7.0	8	53	91	
DH452071	7.1	8	53	91	
DH452072	7.2	8	53	91	
DH452073	7.3	8	53	91	
DH452074	7.4	8	53	91	
DH452075	7.5	8	53	91	
DH452076	7.6	8	53	91	
DH452077	7.7	8	53	91	
DH452078	7.8	8	53	91	
DH452079	7.9	8	53	91	
DH452080	8.0	8	53	91	
DH452081	8.1	10	61	103	

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452082	8.2	10	61	103	
DH452083	8.3	10	61	103	
DH452084	8.4	10	61	103	
DH452085	8.5	10	61	103	
DH452086	8.6	10	61	103	
DH452087	8.7	10	61	103	
DH452088	8.8	10	61	103	
DH452089	8.9	10	61	103	
DH452090	9.0	10	61	103	
DH452091	9.1	10	61	103	
DH452092	9.2	10	61	103	
DH452093	9.3	10	61	103	
DH452094	9.4	10	61	103	
DH452095	9.5	10	61	103	
DH452096	9.6	10	61	103	
DH452097	9.7	10	61	103	
DH452098	9.8	10	61	103	
DH452099	9.9	10	61	103	
DH452100	10.0	10	61	103	
DH452101	10.1	12	71	118	
DH452102	10.2	12	71	118	
DH452103	10.3	12	71	118	
DH452104	10.4	12	71	118	
DH452105	10.5	12	71	118	

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

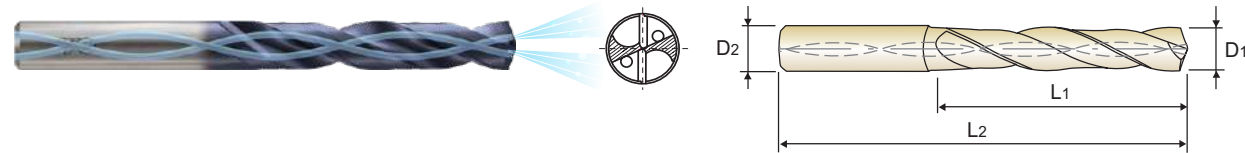
ISO Material Description	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	10	29	32	38	10	15	15	23	10	10	26	3	25	21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N										S					H							
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
INOX with Coolant Holes (5XD)

DH452 SERIES

- ▶ Special flute shape and geometry suitable for machining stainless steel
- ▶ Excellent chip evacuation from better surface treatment
- ▶ Point R-thinning achieves superior centering and chip curling
- ▶ TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

LONG
5 × D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452106	10.6	12	71		118
DH452107	10.7	12	71		118
DH452108	10.8	12	71		118
DH452109	10.9	12	71		118
DH452110	11.0	12	71		118
DH452111	11.1	12	71		118
DH452112	11.2	12	71		118
DH452113	11.3	12	71		118
DH452114	11.4	12	71		118
DH452115	11.5	12	71		118
DH452116	11.6	12	71		118
DH452117	11.7	12	71		118
DH452118	11.8	12	71		118
DH452119	11.9	12	71		118
DH452120	12.0	12	71		118
DH452125	12.5	14	77		124

Unit : mm

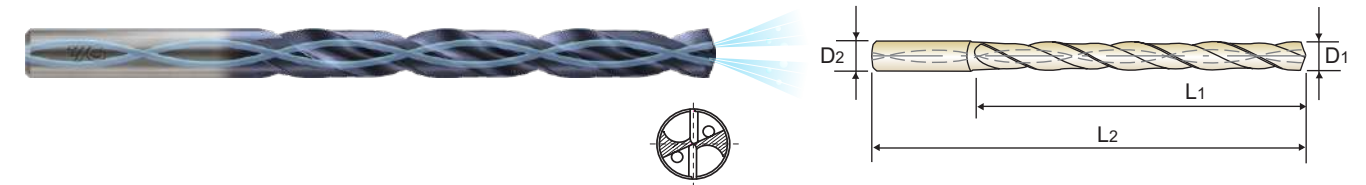
EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH452130	13.0	14	77		124
DH452135	13.5	14	77		124
DH452140	14.0	14	77		124
DH452145	14.5	16	83		133
DH452150	15.0	16	83		133
DH452155	15.5	16	83		133
DH452160	16.0	16	83		133
DH452165	16.5	18	93		143
DH452170	17.0	18	93		143
DH452175	17.5	18	93		143
DH452180	18.0	18	93		143
DH452185	18.5	20	101		153
DH452190	19.0	20	101		153
DH452195	19.5	20	101		153
DH452200	20.0	20	101		153

▶ Other shank types are available on your request.

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
INOX with Coolant Holes (8XD)

DH453 SERIES

- ▶ Special flute shape and geometry suitable for machining stainless steel
- ▶ Excellent chip evacuation from better surface treatment
- ▶ Point R-thinning achieves superior centering and chip curling
- ▶ TiAIN coating for better surface finishes and longer tool life



DIN 6537 CARBIDE h6 m7 140° 20 bar P. 69

EXTRA LONG
8 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH453030	3.0	6	34		72
DH453031	3.1	6	34		72
DH453032	3.2	6	34		72
DH453033	3.3	6	34		72
DH453034	3.4	6	34		72
DH453035	3.5	6	34		72
DH453036	3.6	6	34		72
DH453037	3.7	6	34		72
DH453038	3.8	6	43		81
DH453039	3.9	6	43		81
DH453040	4.0	6	43		81
DH453041	4.1	6	43		81
DH453042	4.2	6	43		81
DH453043	4.3	6	43		81
DH453044	4.4	6	43		81
DH453045	4.5	6	43		81
DH453046	4.6	6	43		81
DH453047	4.7	6	43		81
DH453048	4.8	6	57		95
DH453049	4.9	6	57		95
DH453050	5.0	6	57		95
DH453051	5.1	6	57		95
DH453052	5.2	6	57		95
DH453053	5.3	6	57		95

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length		Overall Length
			L1	L2	
TiAIN					
DH453054	5.4	6	57		95
DH453055	5.5	6	57		95
DH453056	5.6	6	57		95
DH453057	5.7	6	57		95
DH453058	5.8	6	57		95
DH453059	5.9	6	57		95
DH453060	6.0	6	57		95
DH453061	6.1	8	76		114
DH453062	6.2	8	76		114
DH453063	6.3	8	76		114
DH453064	6.4	8	76		114
DH453065	6.5	8	76		114
DH453066	6.6	8	76		114
DH453067	6.7	8	76		114
DH453068	6.8	8	76		114
DH453069	6.9	8	76		114
DH453070	7.0	8	76		114
DH453071	7.1	8	76		114
DH453072	7.2	8	76		114
DH453073	7.3	8	76		114
DH453074	7.4	8	76		114
DH453075	7.5	8	76		114
DH453076	7.6	8	76		114
DH453077	7.7	8	76		114

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	13	25	28	32	10	29	32	38	10	15	15	23	10	10	26	3	25	3	25	21	21	21
HRc	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S				H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

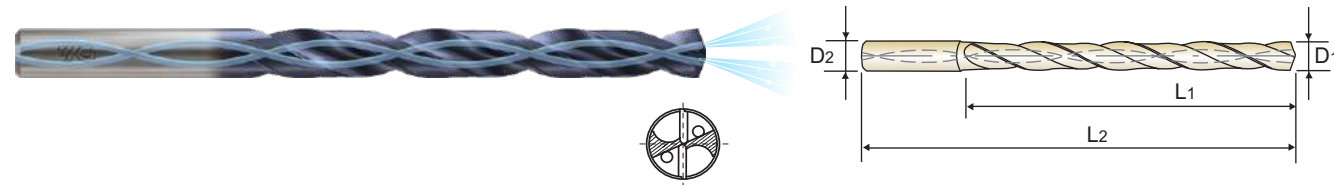
ISO	P										M				K							
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VDI 3323	13	25	28	32	10	29	32	38	10	15	15	23	10	10	26	3	25	3	25	21	21	21
HRc	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S				H								
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron				
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS INOX with Coolant Holes (8XD)

DH453 SERIES

- Special flute shape and geometry suitable for machining stainless steel
- Excellent chip evacuation from better surface treatment
- Point R-thinning achieves superior centering and chip curling
- TiAIN coating for better surface finishes and longer tool life



EXTRA LONG
8 x D

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
DH453078	7.8	8	76	114
DH453079	7.9	8	76	114
DH453080	8.0	8	76	114
DH453081	8.1	10	95	142
DH453082	8.2	10	95	142
DH453083	8.3	10	95	142
DH453084	8.4	10	95	142
DH453085	8.5	10	95	142
DH453086	8.6	10	95	142
DH453087	8.7	10	95	142
DH453088	8.8	10	95	142
DH453089	8.9	10	95	142
DH453090	9.0	10	95	142
DH453091	9.1	10	95	142
DH453092	9.2	10	95	142
DH453093	9.3	10	95	142
DH453094	9.4	10	95	142
DH453095	9.5	10	95	142
DH453096	9.6	10	95	142
DH453097	9.7	10	95	142
DH453098	9.8	10	95	142
DH453099	9.9	10	95	142
DH453100	10.0	10	95	142
DH453101	10.1	12	114	162

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
DH453102	10.2	12	114	162
DH453103	10.3	12	114	162
DH453104	10.4	12	114	162
DH453105	10.5	12	114	162
DH453106	10.6	12	114	162
DH453107	10.7	12	114	162
DH453108	10.8	12	114	162
DH453109	10.9	12	114	162
DH453110	11.0	12	114	162
DH453111	11.1	12	114	162
DH453112	11.2	12	114	162
DH453113	11.3	12	114	162
DH453114	11.4	12	114	162
DH453115	11.5	12	114	162
DH453116	11.6	12	114	162
DH453117	11.7	12	114	162
DH453118	11.8	12	114	162
DH453119	11.9	12	114	162
DH453120	12.0	12	114	162
DH453125	12.5	14	133	178
DH453130	13.0	14	133	178
DH453135	13.5	14	133	178
DH453140	14.0	14	133	178

► Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P										M				K									
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
HRC	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76
HB	125	190	250	270	300	180	215	245	275	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					H														
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HRC	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
HB	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

RECOMMENDED CUTTING CONDITIONS

DH451, DH452, DH453 SERIES with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)				Vc	Parameter	Drill Diameter (mm)			
					1.0	2.0	3.0	4.0			5.0	6.0		
P	2	Non-alloy steel	70	RPM	22280	11140	10610	7960	6370	5310	10610	7960	6370	5310
			FEED	0.02-0.04	0.04-0.06	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20					
	3	Non-alloy steel	70	RPM	22280	11140	10610	7960	6370	5310	10610	7960	6370	5310
			FEED	0.02-0.04	0.04-0.06	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20					
6	Low alloy steel	70	RPM	22280	11140	10610	7960	6370	5310	10610	7960	6370	5310	
		FEED	0.02-0.04	0.04-0.06	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20						
7	Low alloy steel	50	RPM	15920	7960	7430	5570	4460	3710	7430	5570	4460	3710	
		FEED	0.02-0.04	0.04-0.06	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20						
M	12	Stainless steel	40	RPM	12730	6370	5310	3980	3180	2650	5310	3980	3180	2650
			FEED	0.02-0.04	0.02-0.04	0.03-0.05	0.05-0.09	0.07-0.11	0.09-0.13					
			25	RPM	7960	3980	4240	3180	2550	2120	4240	3180	2550	2120
13	Stainless steel	45	RPM	14320	7160	6370	4770	3820	3180	6370	4770	3820	3180	
		FEED	0.02-0.04	0.02-0.04	0.03-0.05	0.05-0.09	0.07-0.11	0.09-0.13						
		60	RPM	19100	9550	14320	11460	9550	7430	5570	4460	3710	3180	
N	21	Aluminum-wrought alloy	130	RPM	41380	20690	19100	14320	11460	9550	19100	14320	11460	9550
			FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28					
			130	RPM	41380	20690	19100	14320	11460	9550	19100	14320	11460	9550
			FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28					
			160	RPM	35010	17510	16980	12730	10190	8490	16980	12730	10190	8490
23	Aluminum-cast, alloyed	110	RPM	35010	17510	16980	12730	10190	8490	16980	12730	10190	8490	
		FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28						
		160	RPM	35010	17510	16980	12730	10190	8490	16980	12730	10190	8490	
		FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28						
		90	RPM	28650	14320	13790	10350	8280	6900	13790	10350	8280	6900	
24	Aluminum-cast, alloyed	160	RPM	35010	17510	16980	12730	10190	8490	16980	12730	10190	8490	
		FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28						
25	Aluminum-cast, alloyed	160	RPM	35010	17510	16980	12730	10190	8490	16980	12730	10190	8490	
		FEED	0.04-0.10	0.08-0.14	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28						
S	37	Titanium Alloys	25	RPM	7960	3980	4240	3180	2550	2120	4240	3180	2550	2120
			FEED	0.01-0.03	0.01-0.03	0.02-0.04	0.04-0.08	0.06-0.10	0.08-0.12					

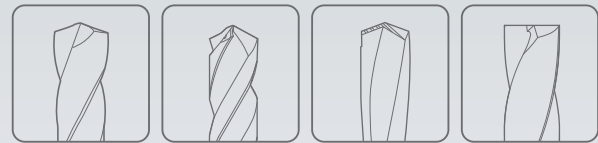
ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)							
					8.0	10.0	12.0	14.0	16.0	18.0	20.0	
P	2	Non-alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590	1590
			FEED	0.16-0.22	0.20-0.26	0.18-0.28	0.20-0.30	0.22-0.32	0.26-0.36	0.28-0.38		
	3	Non-alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590	1590
			FEED	0.16-0.22	0.20-0.26	0.18-0.28	0.20-0.30	0.22-0.32	0.26-0.36	0.28-0.38		
6	Low alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590	1590	
		FEED	0.16-0.22	0.20-0.26	0.18-0.28	0.20-0.30	0.22-0.32	0.26-0.36	0.28-0.38			
7	Low alloy steel	70	RPM	2790	2230	1860	1590	1390	1240	1110	1110	
		FEED	0.16-0.22	0.20-0.26	0.18-0.28	0.20-0.30	0.22-0.32	0.26-0.36	0.28-0.38			
M	12	Stainless steel	50	RPM	1990	1590	1330	1140	990	880	800	
			FEED	0.09-0.13	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20		
			40	RPM	1590	1270	1060	910	800	710	640	
13	Stainless steel	60	RPM	2390	1910	1590	1360	1190	1060	950		
		FEED	0.10-0.14	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20	0.16-0.21			
		40	RPM	1590	1270	1060	910	800	710	640		
N	21	Aluminum-wrought alloy	180	RPM	7160	5730	4770	4090	3580	3180	2860	
			FEED	0.24-0.30	0.29-0.35	0.29-0.35	0.30-0.40	0.30-0.40	0.33-0.43	0.35-0.45		
			180	RPM	7160	5730	4770	4090	3580	3180	2860	
			FEED	0.24-0.30	0.29-0.35	0.29-0.35	0.30-0.40	0.30-0.40	0.33-0.43	0.35-0.45		
			160	RPM	6370	5090	4240	3640	3180	2830	2550	
23	Aluminum-cast, alloyed	160	RPM	6370	5090	4240	3640	3180	2830	2550		
		FEED	0.24-0.30	0.29-0.35	0.29-0.35	0.30-0.40	0.30-0.40	0.33-0.43	0.35-0.45			
		160	RPM	6370	5090	4240	3640	3180	2830	2550		
		FEED	0.24-0.30	0.29-0.35	0.29-0.35	0.30-0.40	0.30-0.40	0.33-0.43	0.35-0.45			
		130	RPM	5170	4140	3450	2960	2590	2300	2070		
24	Aluminum-cast, alloyed	130	RPM	5170	4140	3450	2960	2590	2300	2070		



Leading Through Innovation



Global Cutting Tool Leader **YG-1**



DREAM DRILLS



SOLID CARBIDE

DREAM DRILLS ALU

- For Aluminum and Aluminum Alloys

DREAM DRILLS ALU



Design that optimized flute shape and geometry suitable for Aluminum, Aluminum alloy.



Optimized point thinning to prevent any chip-clogging from chip welding.

Polished flutes improve chip control and evacuation.

The Drilling of High Speed is possible while maintaining the excellent surface roughness of workpiece.

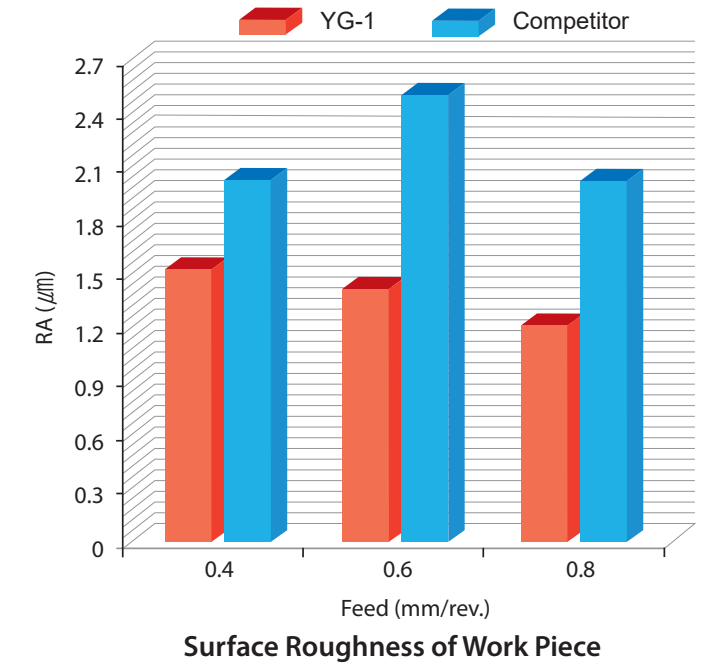
Ø6.0 & Ø10.0 TEST, Aluminum(6061)

CUTTING CONDITION	DREAM DRILL-ALU		COMPETITOR A	
	Roundness	Straightness	Roundness	Straightness
SIZE Ø 6.0				
Drilling Holes 1200 Holes				
SIZE Ø10.0				
Drilling Holes 820 Holes				

CASE STUDY

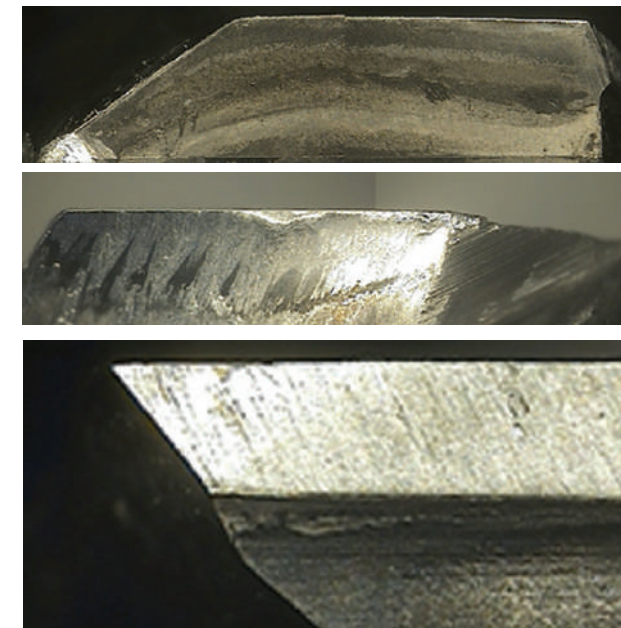
► SOLID CARBIDE DREAM DRILLS - ALU with Coolant Holes

CUTTING CONDITION	
Tool	D5433100 (DREAM DRILLS-ALU)
Size	Ø10 × Ø10 × 61 × 103
Work Material	• DIN: AlMgSiCu • AISI: 6061 • JIS: A6061
RPM	6,367 rev./min.
Feed	0.4-0.8 mm/rev.
Drilling Depth	45 mm
Coolant	Wet cut



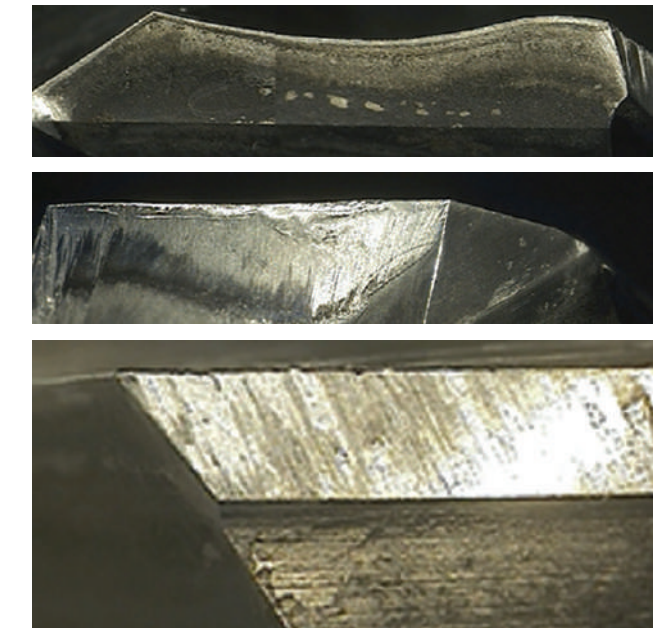
YG-1

Total Drilling 820 Holes



Competitor A

Total Drilling 820 Holes



SOLID CARBIDE DREAM DRILLS
ALU with Coolant Holes (5XD)

D5433 SERIES

- ▶ Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- ▶ Wider and deeper flute gullets for maximum chip removal
- ▶ Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 CARBIDE h6 m7 118° 20 bar P. 80

LONG
5 × D

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D5433030	3.0	6	28	66
D5433031	3.1	6	28	66
D5433032	3.2	6	28	66
D5433033	3.3	6	28	66
D5433034	3.4	6	28	66
D5433035	3.5	6	28	66
D5433036	3.6	6	28	66
D5433037	3.7	6	28	66
D5433038	3.8	6	36	74
D5433039	3.9	6	36	74
D5433040	4.0	6	36	74
D5433041	4.1	6	36	74
D5433042	4.2	6	36	74
D5433043	4.3	6	36	74
D5433044	4.4	6	36	74
D5433045	4.5	6	36	74
D5433046	4.6	6	36	74
D5433047	4.7	6	36	74
D5433048	4.8	6	44	82
D5433049	4.9	6	44	82
D5433050	5.0	6	44	82
D5433051	5.1	6	44	82
D5433052	5.2	6	44	82
D5433053	5.3	6	44	82
D5433054	5.4	6	44	82
D5433055	5.5	6	44	82

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D5433056	5.6	6	44	82
D5433057	5.7	6	44	82
D5433058	5.8	6	44	82
D5433059	5.9	6	44	82
D5433060	6.0	6	44	82
D5433061	6.1	8	53	91
D5433062	6.2	8	53	91
D5433063	6.3	8	53	91
D5433064	6.4	8	53	91
D5433065	6.5	8	53	91
D5433066	6.6	8	53	91
D5433067	6.7	8	53	91
D5433068	6.8	8	53	91
D5433069	6.9	8	53	91
D5433070	7.0	8	53	91
D5433071	7.1	8	53	91
D5433072	7.2	8	53	91
D5433073	7.3	8	53	91
D5433074	7.4	8	53	91
D5433075	7.5	8	53	91
D5433076	7.6	8	53	91
D5433077	7.7	8	53	91
D5433078	7.8	8	53	91
D5433079	7.9	8	53	91
D5433080	8.0	8	53	91
D5433081	8.1	10	61	103

- ▶ DLC coating is available on your request.
- ▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	75	90	100	110	90	100				15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

SOLID CARBIDE DREAM DRILLS
ALU with Coolant Holes (5XD)

D5433 SERIES

- ▶ Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- ▶ Wider and deeper flute gullets for maximum chip removal
- ▶ Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 CARBIDE h6 m7 118° 20 bar P. 80

LONG
5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D5433082	8.2	10	61	103
D5433083	8.3	10	61	103
D5433084	8.4	10	61	103
D5433085	8.5	10	61	103
D5433086	8.6	10	61	103
D5433087	8.7	10	61	103
D5433088	8.8	10	61	103
D5433089	8.9	10	61	103
D5433090	9.0	10	61	103
D5433091	9.1	10	61	103
D5433092	9.2	10	61	103
D5433093	9.3	10	61	103
D5433094	9.4	10	61	103
D5433095	9.5	10	61	103
D5433096	9.6	10	61	103
D5433097	9.7	10	61	103
D5433098	9.8	10	61	103
D5433099	9.9	10	61	103
D5433100	10.0	10	61	103
D5433101	10.1	12	71	118
D5433102	10.2	12	71	118
D5433103	10.3	12	71	118
D5433104	10.4	12	71	118
D5433105	10.5	12	71	118
D5433106	10.6	12	71	118
D5433107	10.7	12	71	118
D5433108	10.8	12	71	118
D5433109	10.9	12	71	118

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D5433110	11.0	12	71	118
D5433111	11.1	12	71	118
D5433112	11.2	12	71	118
D5433113	11.3	12	71	118
D5433114	11.4	12	71	118
D5433115	11.5	12	71	118
D5433116	11.6	12	71	118
D5433117	11.7	12	71	118
D5433118	11.8	12	71	118
D5433119	11.9	12	71	118
D5433120	12.0	12	71	118
D5433125	12.5	14	77	124
D5433130	13.0	14	77	124
D5433135	13.5	14	77	124
D5433140	14.0	14	77	124
D5433145	14.5	16	83	133
D5433150	15.0	16	83	133
D5433155	15.5	16	83	133
D5433160	16.0	16	83	133
D5433165	16.5	18	93	143
D5433170	17.0	18	93	143
D5433175	17.5	18	93	143
D5433180	18.0	18	93	143
D5433185	18.5	20	101	153
D5433190	19.0	20	101	153
D5433195	19.5	20	101	153
D5433200	20.0	20	101	153

- ▶ DLC coating is available on your request.
- ▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

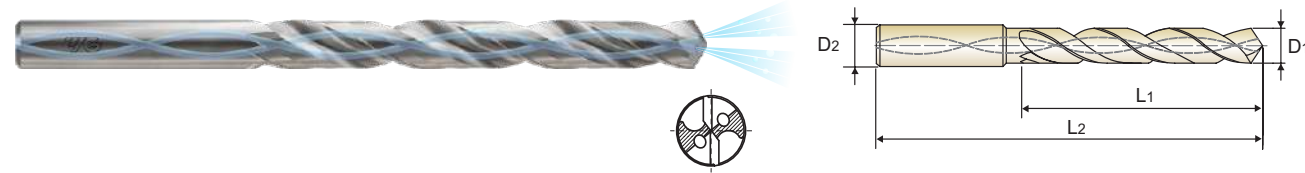
ISO Material Description	P									M				K						
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO Material Description	N						S					H									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys		Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	75	90	100	110	90	100				15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

SOLID CARBIDE DREAM DRILLS
ALU with Coolant Holes (8XD)

D5434 SERIES

- ▶ Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- ▶ Wider and deeper flute gullets for maximum chip removal
- ▶ Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 CARBIDE h6 m7 118° 20 bar P. 80

EXTRA LONG
8 x D

EDP No.	Drill Diameter		Flute Length L1	Overall Length L2
	D1	D2		
D5434030	3.0	6	34	72
D5434031	3.1	6	34	72
D5434032	3.2	6	34	72
D5434033	3.3	6	34	72
D5434034	3.4	6	34	72
D5434035	3.5	6	34	72
D5434036	3.6	6	34	72
D5434037	3.7	6	34	72
D5434038	3.8	6	43	81
D5434039	3.9	6	43	81
D5434040	4.0	6	43	81
D5434041	4.1	6	43	81
D5434042	4.2	6	43	81
D5434043	4.3	6	43	81
D5434044	4.4	6	43	81
D5434045	4.5	6	43	81
D5434046	4.6	6	43	81
D5434047	4.7	6	43	81
D5434048	4.8	6	57	95
D5434049	4.9	6	57	95
D5434050	5.0	6	57	95
D5434051	5.1	6	57	95
D5434052	5.2	6	57	95
D5434053	5.3	6	57	95

Unit : mm

EDP No.	Drill Diameter		Flute Length L1	Overall Length L2
	D1	D2		
D5434054	5.4	6	57	95
D5434055	5.5	6	57	95
D5434056	5.6	6	57	95
D5434057	5.7	6	57	95
D5434058	5.8	6	57	95
D5434059	5.9	6	57	95
D5434060	6.0	6	57	95
D5434061	6.1	8	76	114
D5434062	6.2	8	76	114
D5434063	6.3	8	76	114
D5434064	6.4	8	76	114
D5434065	6.5	8	76	114
D5434066	6.6	8	76	114
D5434067	6.7	8	76	114
D5434068	6.8	8	76	114
D5434069	6.9	8	76	114
D5434070	7.0	8	76	114
D5434071	7.1	8	76	114
D5434072	7.2	8	76	114
D5434073	7.3	8	76	114
D5434074	7.4	8	76	114
D5434075	7.5	8	76	114
D5434076	7.6	8	76	114
D5434077	7.7	8	76	114

- ▶ DLC coating is available on your request.
- ▶ Other shank types are available on your request.

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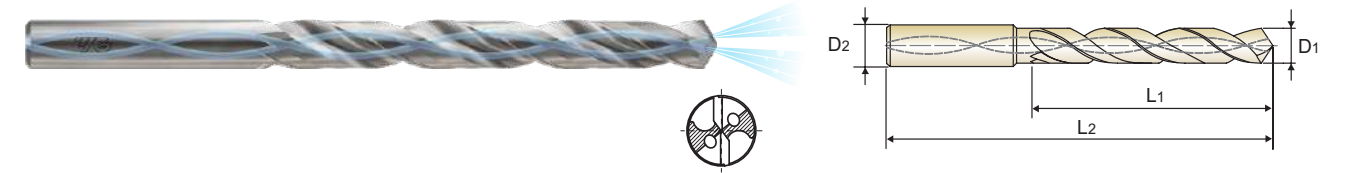
© : Excellent ○ : Good

ISO Material Description	P									M				K							
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					
ISO Material Description	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

SOLID CARBIDE DREAM DRILLS
ALU with Coolant Holes (8XD)

D5434 SERIES

- ▶ Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- ▶ Wider and deeper flute gullets for maximum chip removal
- ▶ Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 CARBIDE h6 m7 118° 20 bar P. 80

EXTRA LONG
8 x D

Unit : mm

EDP No.	Drill Diameter		Flute Length L1	Overall Length L2
	D1	D2		
D5434078	7.8	8	76	114
D5434079	7.9	8	76	114
D5434080	8.0	8	76	114
D5434081	8.1	10	95	142
D5434082	8.2	10	95	142
D5434083	8.3	10	95	142
D5434084	8.4	10	95	142
D5434085	8.5	10	95	142
D5434086	8.6	10	95	142
D5434087	8.7	10	95	142
D5434088	8.8	10	95	142
D5434089	8.9	10	95	142
D5434090	9.0	10	95	142
D5434091	9.1	10	95	142
D5434092	9.2	10	95	142
D5434093	9.3	10	95	142
D5434094	9.4	10	95	142
D5434095	9.5	10	95	142
D5434096	9.6	10	95	142
D5434097	9.7	10	95	142
D5434098	9.8	10	95	142
D5434099	9.9	10	95	142
D5434100	10.0	10	95	142
D5434101	10.1	12	114	162

Unit : mm

EDP No.	Drill Diameter		Flute Length L1	Overall Length L2
	D1	D2		
D5434102	10.2	12	114	162
D5434103	10.3	12	114	162
D5434104	10.4	12	114	162
D5434105	10.5	12	114	162
D5434106	10.6	12	114	162
D5434107	10.7	12	114	162
D5434108	10.8	12	114	162
D5434109	10.9	12	114	162
D5434110	11.0	12	114	162
D5434111	11.1	12	114	162
D5434112	11.2	12	114	162
D5434113	11.3	12	114	162
D5434114	11.4	12	114	162
D5434115	11.5	12	114	162
D5434116	11.6	12	114	162
D5434117	11.7	12	114	162
D5434118	11.8	12	114	162
D5434119	11.9	12	114	162
D5434120	12.0	12	114	162
D5434125	12.5	14	133	178
D5434130	13.0	14	133	178
D5434135	13.5	14	133	178
D5434140	14.0	14	133	178

- ▶ DLC coating is available on your request.
- ▶ Other shank types are available on your request.

© : Excellent ○ : Good

ISO Material Description	P									M				K							
	Non-alloy steel			Low alloy steel			High alloyed steel, and tool steel			Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					
ISO Material Description	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	36	37	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	



Leading Through Innovation

D5432, D5433, D5434 SERIES with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)										
					3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21	Aluminum-wrought alloy	200	RPM	21220	15920	12730	10610	7960	6370	5310	4550	3980	3540	3180
				FEED	0.12-0.18	0.14-0.22	0.15-0.23	0.17-0.25	0.21-0.28	0.24-0.30	0.24-0.30	0.25-0.35	0.25-0.35	0.28-0.38	0.30-0.40
	22	Aluminum-wrought alloy	160	RPM	16980	12730	10190	8490	6370	5090	4240	3640	3180	2830	2550
				FEED	0.12-0.18	0.14-0.22	0.15-0.23	0.17-0.25	0.21-0.28	0.24-0.30	0.24-0.30	0.25-0.35	0.25-0.35	0.28-0.38	0.30-0.40
	23	Aluminum-cast, alloyed	150	RPM	15920	11940	9550	7960	5970	4770	3980	3410	2980	2650	2390
				FEED	0.15-0.21	0.17-0.25	0.19-0.27	0.21-0.28	0.24-0.31	0.29-0.45	0.33-0.55	0.35-0.60	0.35-0.60	0.39-0.73	0.39-0.85
	24	Aluminum-cast, alloyed	140	RPM	14850	11140	8910	7430	5570	4460	3710	3180	2790	2480	2230
				FEED	0.15-0.21	0.17-0.25	0.19-0.27	0.21-0.28	0.24-0.31	0.29-0.45	0.33-0.55	0.35-0.60	0.35-0.60	0.39-0.73	0.39-0.85



SOLID CARBIDE

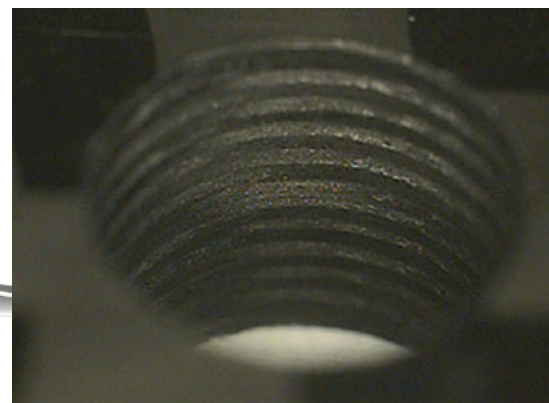
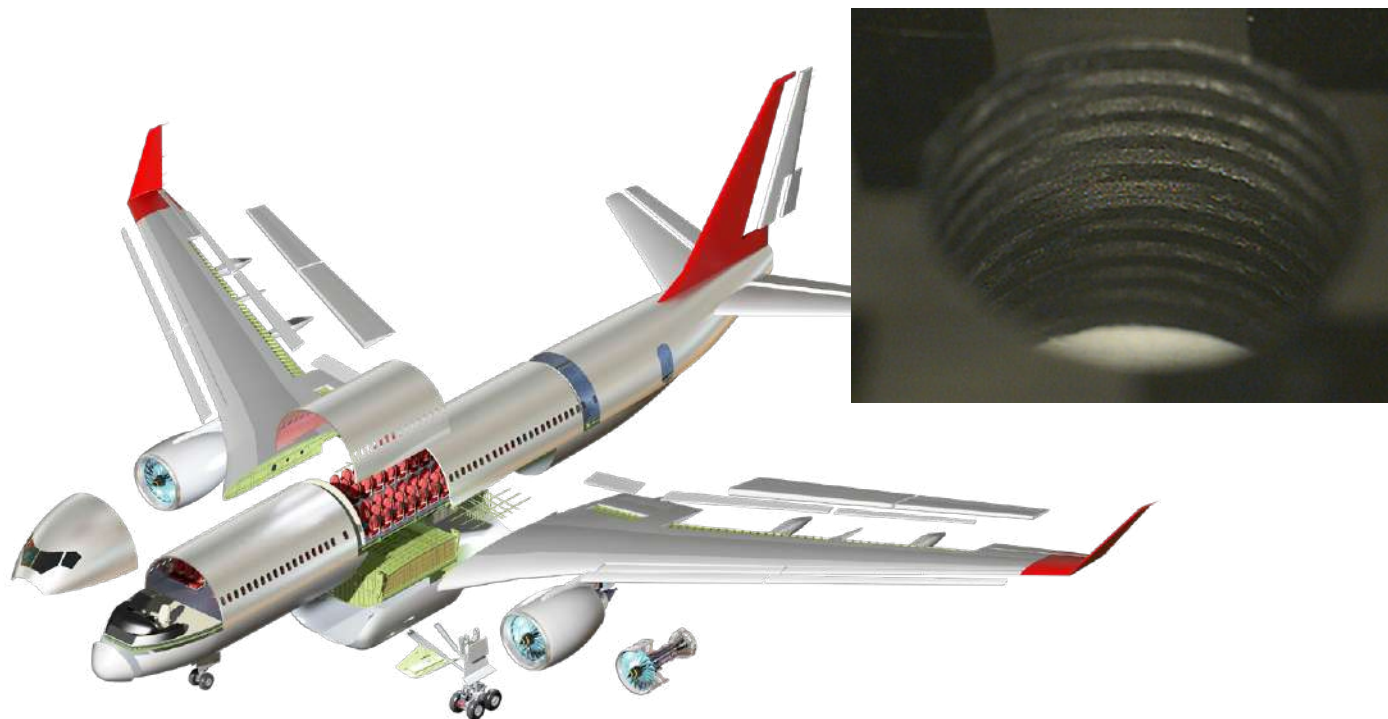
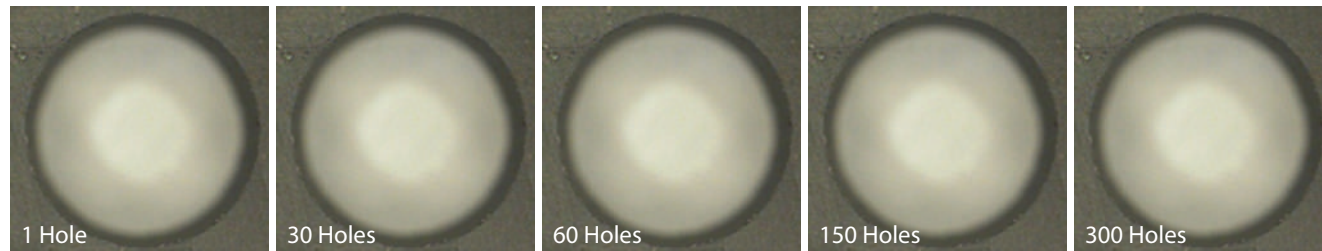
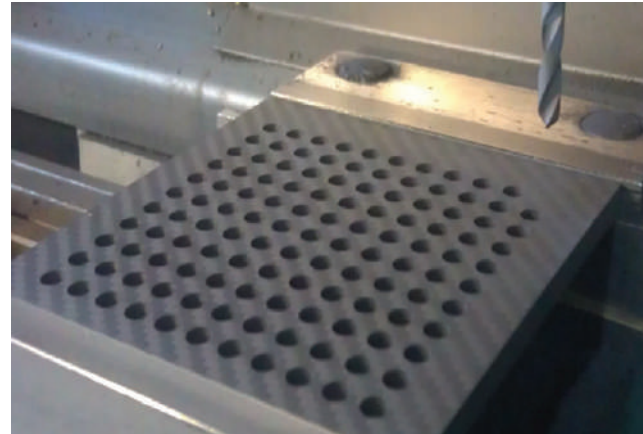
**DREAM DRILLS
CFRP**

- For Composite Materials including CFRP and GFRP

CASE STUDY

► SOLID CARBIDE DREAM DRILLS - CFRP without Coolant Holes

CUTTING CONDITION	
Tool	DI473060 (DREAM DRILLS - CFRP)
Size	Ø6 × Ø6 × 44 × 82
Work Material	CFRP
RPM	6,366 rev./min.
Feed	254.64 mm/min.
Drilling Depth	6 mm, Through Hole
Coolant	Dry Cut



DIAMOND-COATED SOLID CARBIDE DREAM DRILLS CFRP without Coolant Holes (3XD)

DI473 SERIES

- Special point type to improve hole quality for Composite Materials
- Minimized burr and delamination at entry / exit hole
- Outstanding performance
- Long tool life and increased product by Diamond Coating



3 × D

EDP No.	Unit : mm			
	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
▲ DI473025	2.5	6	24	66
▲ DI473030	3.0	6	28	66
▲ DI473040	4.0	6	36	74
▲ DI473050	5.0	6	44	82
▲ DI473060	6.0	6	44	82
▲ DI473080	8.0	8	53	91
▲ DI473090	9.0	10	61	103
▲ DI473100	10.0	10	61	103
▲ DI473110	11.0	12	71	118
▲ DI473120	12.0	12	71	118

▲ : Only available till stock runs out



CUTTING CONDITIONS

DI473 SERIES DREAM DRILLS- CFRP

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)						
					3.0	4.0	5.0	6.0	8.0	10.0	20.0
N	21	CFRP, GFRP	120	RPM FEED	12730 0.03-0.07	9550 0.03-0.07	7640 0.03-0.07	6370 0.03-0.07	4770 0.03-0.07	3820 0.03-0.07	3180 0.03-0.07

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel		Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	41	41	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					
ISO	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys				Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

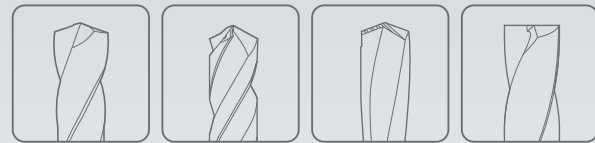
◎ : Excellent ○ : Good



Leading Through Innovation



Global Cutting Tool Leader **YG-1**



DREAM DRILLS



SOLID CARBIDE

DREAM DRILLS MQL TYPE

- Minimum Quantity Lubrication
Drilling Deep Holes (10xD - 40xD)

DREAM DRILLS MQL TYPE

4-Facet point for good centering capability

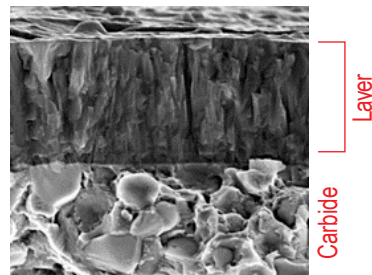


Polished flute for enhanced chip evacuation

Optimized special flutes are ideal for removing chips and for productive drilling



Upgraded **TiAlN nano Layer Full Coating**

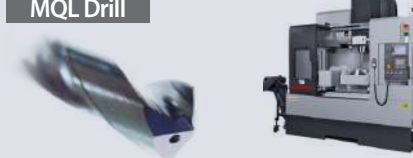


Compatible with the **MQL** (Minimum Quantity Lubrication) system.

- Reduction of Cooling Cost
- Reduce generation of dioxin for human [Eco-Friendly]

Compare with Gun drills

- Used on conventional machining center (MQL Drills)
- Higher productivity than conventional HSS deep hole drills and Gun drills

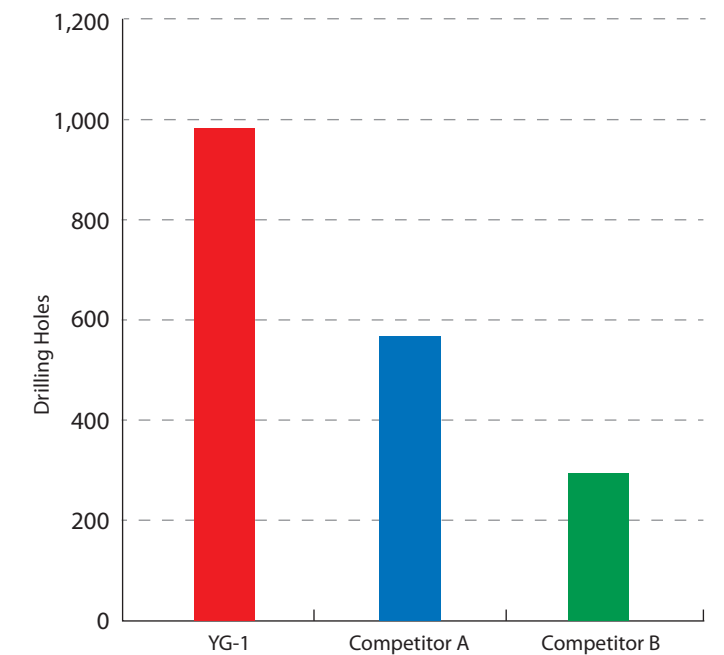
<p>Gun drill</p>  <p>Gun drilling Machine</p>	<p>Productivity ↑</p> <p>Up to 10 times Drilling Feedrate</p>	<p>MQL Drill</p>  <p>Vertical & Horizontal Machining Center</p>
<p>- Size Range : Ø2~Ø25</p> <p>- Drilling Depth : 25xD ~ over 100xD</p> <p>* Need Gun drilling machine</p>		<p>- Size Range : Ø3~Ø14</p> <p>- Drilling Depth : 10xD ~ 40xD</p> <p>* Need enough machine stroke on machining center</p>

CASE STUDY

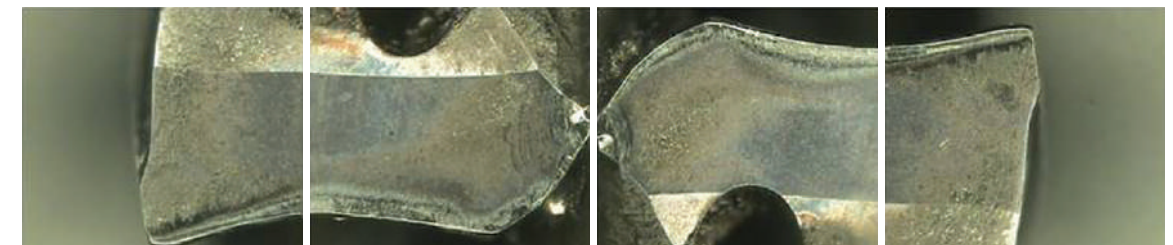
- Flute Shape and Point Shape allowing better chip evacuation in deep hole drilling
- Excellent Coating and Surface Treatment for better performance and chip evacuation

► SOLID CARBIDE DREAM DRILLS - MQL Type with Coolant Holes

CUTTING CONDITION	
Tool	DH520060 (DREAM DRILL- MQL TYPE, 20xD)
Size	Ø6 × Ø6 × 138 × 193
Work Material	• DIN: C45 • WR: 1.0503 • JIS: S45C(HRc25)
RPM	3,528 rev./min.
Feed	0.19 mm/rev.
Drilling Depth	80 mm
Coolant	Oil Mist (MQL Techniques)

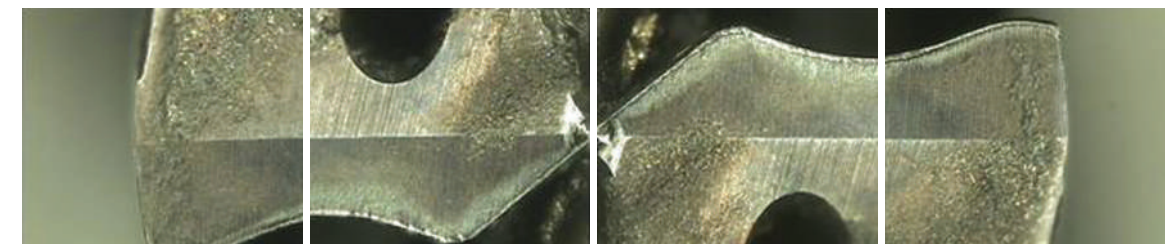


YG-1



After Drilling 1,000 Holes

Competitor A

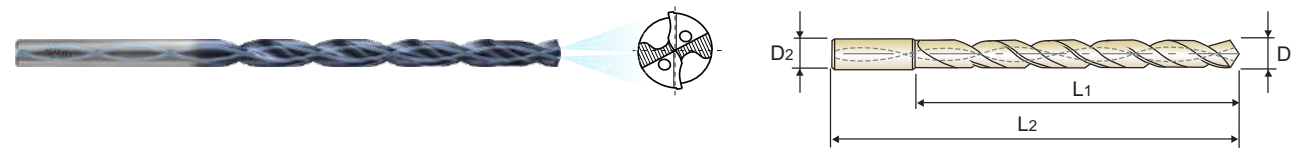


After Drilling 546 Holes

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
MQL with Coolant Holes (10XD)

DH510 SERIES

- ▶ 4-Facet Point for good centering capability
- ▶ Optimized special flutes are ideal for removing chips and for productive drilling
- ▶ Enhanced chip evacuation by polished flute upgraded TiAIN nano layer full coating
- ▶ MQL system compatible (Minimum Quantity Lubrication)



EXTRA LONG
10 × D

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				L1	L2
TiAIN	D1	D2	L1	L2	
DH510030	3.0	3	39	90	
DH510033	3.3	4	46	97	
DH510035	3.5	4	46	97	
DH510040	4.0	4	52	103	
DH510042	4.2	5	59	112	
DH510045	4.5	5	59	112	
DH510050	5.0	5	65	118	
DH510055	5.5	6	72	127	
DH510060	6.0	6	78	133	
DH510065	6.5	7	85	141	
DH510068	6.8	7	91	147	
DH510070	7.0	7	91	147	
DH510075	7.5	8	98	155	
DH510080	8.0	8	104	161	

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				L1	L2
TiAIN	D1	D2	L1	L2	
DH510085	8.5	9	111	169	
DH510090	9.0	9	117	175	
DH510095	9.5	10	124	182	
DH510100	10.0	10	130	188	
DH510105	10.5	11	137	201	
DH510110	11.0	11	143	207	
DH510115	11.5	12	150	215	
DH510120	12.0	12	156	221	
DH510125	12.5	13	163	229	
DH510130	13.0	13	169	235	
DH510135	13.5	14	176	243	
DH510140	14.0	14	182	249	

◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
VDI 3323	1	13	25	28	32	10	29	32	38	10	15	35	15	23	10	10	26	3	25	10	21	15	23	10	10	26
HRC	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	180	250	130	230	180	260	160	250		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

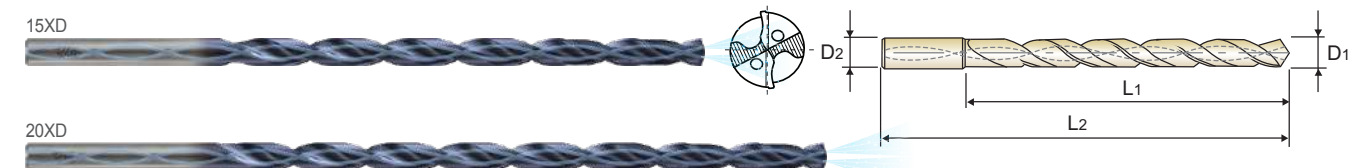
ISO	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TiAIN-COATED SOLID CARBIDE DREAM DRILLS
MQL with Coolant Holes (15XD, 20XD)

DH515 SERIES

DH520 SERIES

- ▶ 4-Facet Point for good centering capability
- ▶ Optimized special flutes are ideal for removing chips and for productive drilling
- ▶ Enhanced chip evacuation by polished flute upgraded TiAIN nano layer full coating
- ▶ MQL system compatible (Minimum Quantity Lubrication)



EXTRA LONG

15 × D (DH515) 20 × D (DH520)

DH515

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				L1	L2
TiAIN	D1	D2	L1	L2	
DH515030	3.0	3	54	105	
DH515035	3.5	4	63	114	
DH515040	4.0	4	72	123	
DH515045	4.5	5	81	134	
DH515050	5.0	5	90	143	
DH515055	5.5	6	99	154	
DH515060	6.0	6	108	163	
DH515070	7.0	7	126	182	
DH515080	8.0	8	144	201	
DH515090	9.0	9	162	220	
DH515100	10.0	10	180	238	
DH515110	11.0	11	198	262	
DH515120	12.0	12	216	281	

DH520

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				L1	L2
TiAIN	D1	D2	L1	L2	
DH520030	3.0	3	69	120	
DH520035	3.5	4	81	132	
DH520040	4.0	4	92	143	
DH520045	4.5	5	104	157	
DH520050	5.0	5	115	168	
DH520055	5.5	6	127	182	
DH520060	6.0	6	138	193	
DH520070	7.0	7	161	217	
DH520080	8.0	8	184	241	
DH520090	9.0	9	207	265	
DH520100	10.0	10	230	288	
DH520120	12.0	12	276	341	

◎ : Excellent ○ : Good

ISO	P										M				K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron	Nodular cast iron		Malleable cast iron				
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
VDI 3323	1	13	25	28	32	10	29	32	38	10	15	35	15	23	10	10	26	3	25	10	21	15	23	10	10	26
HRC	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	180	250	130	230	180	260	160	250		
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S				H						
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

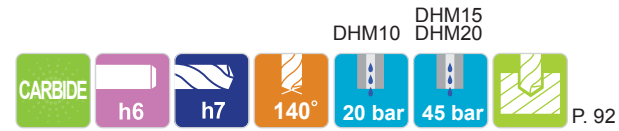
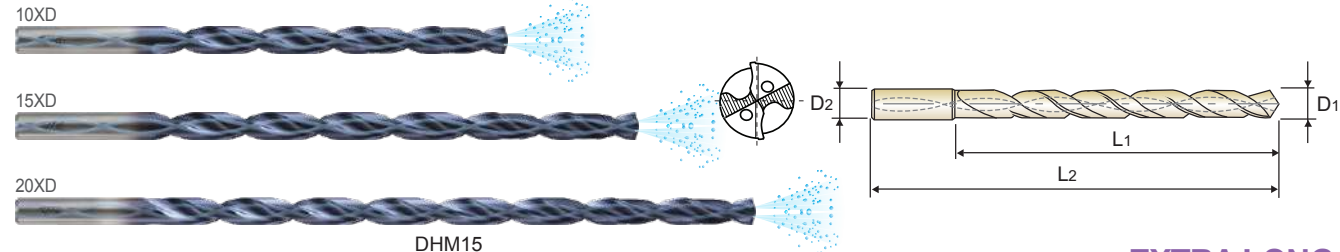
TiAIN-COATED SOLID CARBIDE DREAM DRILLS
MQL with Coolant Holes (10XD, 15XD, 20XD)

DHM10 SERIES

DHM15 SERIES

DHM20 SERIES

- ▶ 4-Facet Point for good centering capability
- ▶ Optimized special flutes are ideal for removing chips and for productive drilling
- ▶ Enhanced chip evacuation by polished flute upgraded TiAIN nano layer full coating
- ▶ MQL system compatible (Minimum Quantity Lubrication)



EXTRA LONG

10 × D (DHM10)	15 × D (DHM15)	20 × D (DHM20)
----------------	----------------	----------------

DHM10					
EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				D1	L2
TiAIN					
DHM10030	3.0	6	40		80
DHM10033	3.3	6	47		87
DHM10035	3.5	6	47		87
DHM10040	4.0	6	53		93
DHM10042	4.2	6	60		100
DHM10045	4.5	6	60		100
DHM10050	5.0	6	66		106
DHM10055	5.5	6	73		113
DHM10060	6.0	6	79		119
DHM10065	6.5	8	86		126
DHM10068	6.8	8	92		132
DHM10070	7.0	8	92		132
DHM10075	7.5	8	99		139
DHM10080	8.0	8	105		145
DHM10085	8.5	10	112		156
DHM10090	9.0	10	118		162
DHM10095	9.5	10	126		170
DHM10100	10.0	10	132		176
DHM10105	10.5	12	139		188
DHM10110	11.0	12	145		194
DHM10115	11.5	12	152		201
DHM10120	12.0	12	158		207
DHM10125	12.5	14	165		214
DHM10130	13.0	14	171		220
DHM10135	13.5	14	178		227
DHM10140	14.0	14	184		233

DHM15					
EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length	
				D1	L2
TiAIN					
DHM15030	3.0	6	55		95
DHM15035	3.5	6	64		104
DHM15040	4.0	6	73		113
DHM15045	4.5	6	82		122
DHM15050	5.0	6	91		131
DHM15055	5.5	6	100		140
DHM15060	6.0	6	109		149
DHM15070	7.0	8	127		167
DHM15080	8.0	8	145		185
DHM15090	9.0	10	163		207
DHM15100	10.0	10	182		226
DHM15110	11.0	12	200		249
DHM15120	12.0	12	218		267

DHM20				
EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
				L2
TiAIN				
DHM20030	3.0	6	70	110
DHM20035	3.5	6	82	122
DHM20040	4.0	6	93	133
DHM20045	4.5	6	105	145
DHM20050	5.0	6	116	156
DHM20055	5.5	6	128	168
DHM20060	6.0	6	139	179
DHM20070	7.0	8	162	202
DHM20080	8.0	8	185	225
DHM20090	9.0	10	208	252
DHM20100	10.0	10	232	276
DHM20110	11.0	12	255	304
DHM20120	12.0	12	278	327

◎ : Excellent ○ : Good

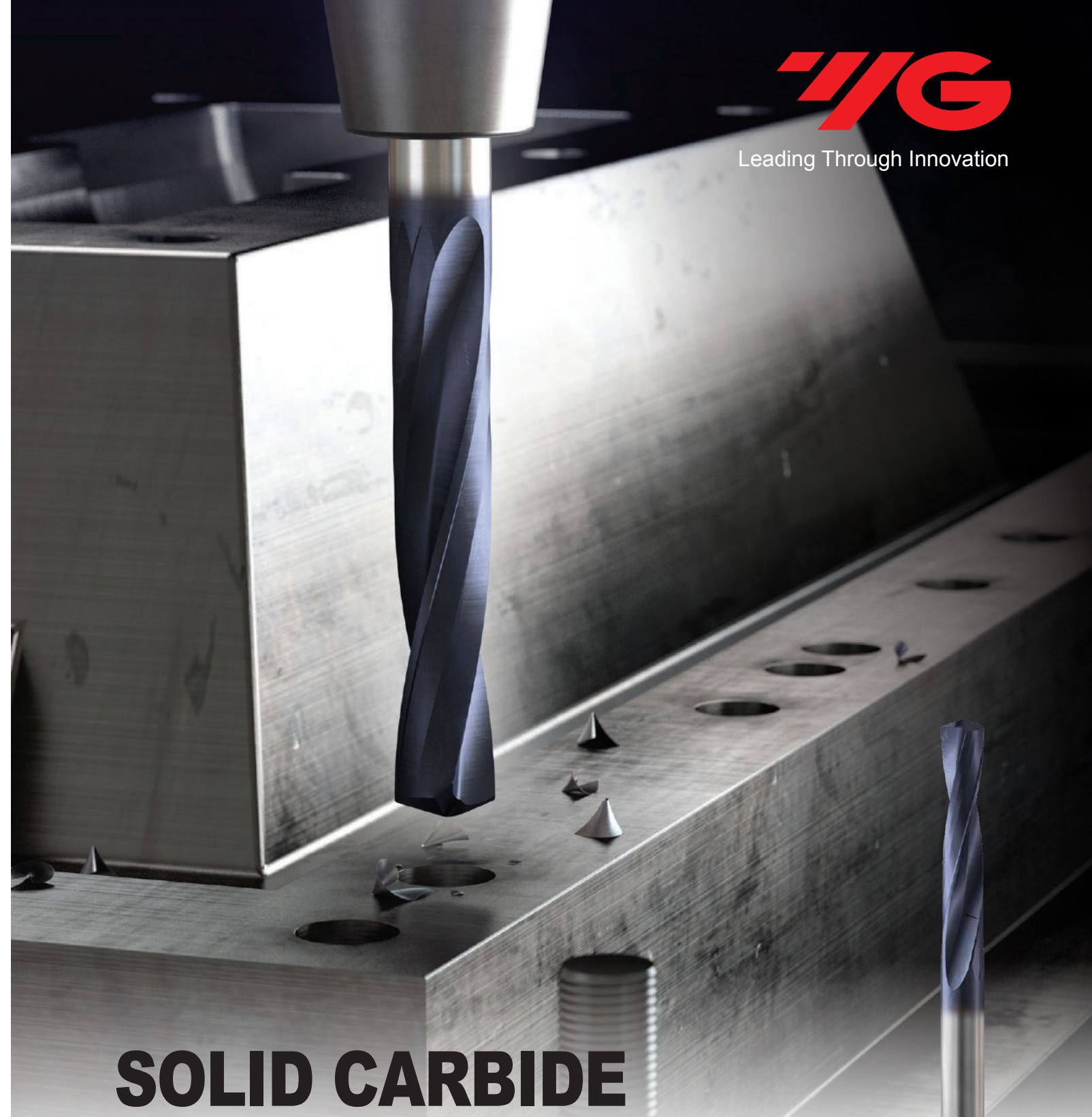
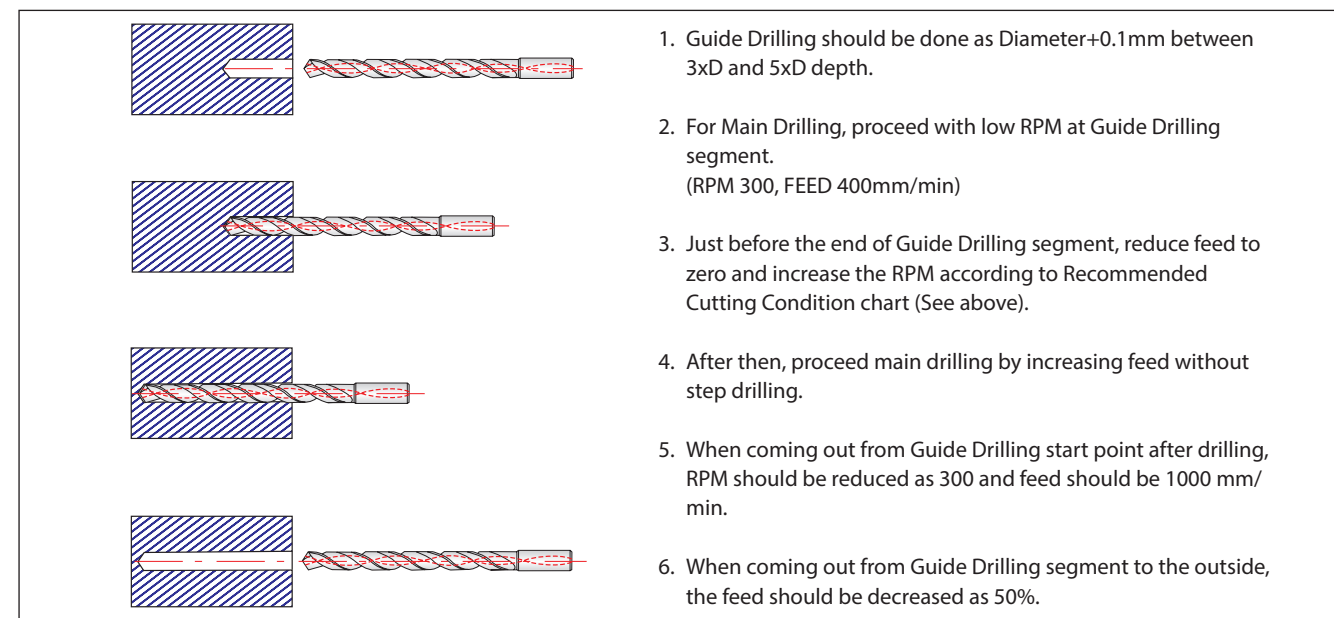
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	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
HRC	13	15	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
HB	125	135	145	155	165	175	185	195	205	215	225	235	245	255	265	275	285	295	305	315	325	335	345	355	365	375	385	395	405	415	425	435	445	455	465	475	485	495	505	515	525	535	545	555	565	575	585	595	605	615	625	635	645	655	665	675	685	695	705	715	725	735	745	755	765	775	785	795	805	815	825	835	845	855	865	875	885	895	905	915	925	935	945	955	965	975	985	995	1005	1015	1025	1035	1045	1055	1065	1075	1085	1095	1105	1115	1125	1135	1145	1155	1165	1175	1185	1195	1205	1215	1225	1235	1245	1255	1265	1275	1285	1295	1305	1315	1325	1335	1345	1355	1365	1375	1385	1395	1405	1415	1425	1435	1445	1455	1465	1475	1485	1495	1505	1515	1525	1535	1545	1555	1565	1575	1585	1595	1605	1615	1625	1635	1645	1655	1665	1675	1685	1695	1705	1715	1725	1735	1745	1755	1765	1775	1785	1795	1805	1815	1825	1835	1845	1855	1865	1875	1885	1895	1905	1915	1925	1935	1945	1955	1965	1975	1985	1995	2005	2015	2025	2035	2045	2055	2065	2075	2085	2095	2105	2115	2125	2135	2145	2155	2165	2175	2185	2195	2205	2215	2225	2235	2245	2255	2265	2275	2285	2295	2305	2315	2325	2335	2345	2355	2365	2375	2385	2395	2405	2415	2425	2435	2445	2455	2465	2475	2485	2495	2505	2515	2525	2535	2545	2555	2565	2575	2585	2595	2605	2615	2625	2635	2645	2655	2665	2675	2685	2695	2705	2715	2725	2735	2745	2755	2765	2775	2785	2795	2805	2815	2825	2835	2845	2855	2865	2875	2885	2895	2905	2915	2925	2935	2945	2955	2965	2975	2985	2995	3005	3015	3025	3035	3045	3055	3065	3075	3085	3095	3105	3115	3125	3135	3145	3155	3165	3175	3185	3195	3205	3215	3225	3235	3245	3255	3265	3275	3285	3295	3305	3315	3325	3335	3345	3355	3365	3375	3385	3395	3405	3415	3425	3435	3445	3455	3465	3475	3485	3495	3505	3515	3525	3535	3545	3555	3565	3575	3585	3595	3605	3615	3625	3635	3645	3655	3665	3675	3685	3695	3705	3715	3725	3735	3745	3755	3765	3775	3785	3795	3805	3815	3825	3835	3845	3855	3865	3875	3885	3895	3905	3915	3925	3935	3945	3955	3965	3975	3985	3995	4005	4015	4025	4035	4045	4055	4065	4075	4085	4095	4105	4115	4125	4135	4145	4155	4165	4175	4185	4195	4205	4215	4225	4235	4245	4255	4265	4275	4285	4295	4305	4315	4325	4335	4345	4355	4365	4375	4385	4395	4405	4415	4425	4435	4445	4455	4465	4475	4485	4495	4505	4515	4525	4535	4545	4555	4565	4575	4585	4595	4605	4615	4625	4635	4645	4655	4665	4675	4685	4695	4705	4715	4725	4735	4745	4755	4765	4775	4785	4795	4805	4815	4825	4835	4845	4855	4865	4875	4885	4895	4905	4915	4925	4935	4945	4955	4965	4975	4985	4995	5005	5015	5025	5035	5045	5055	5065	5075	5085	5095	5105	5115	5125	5135	5145	5155	5165	5175	5185	5195	5205	5215	5225	5235	5245	5255	5265	5275	5285	5295	5305	5315	5325	5335	5345	5355	5365	5375	5385	5395	5405	5415	5425	5435	5445	5455	5465	5475	5485	5495	5505	5515	5525	5535	5545	5555	5565	5575	5585	5595	5605	5615	5625	5635	5645	5655	5665	5675	5685	5695	5705	5715	5725	5735	5745	5755	5765	5775	5785	5795	5805	5815	5825	5835	5845	5855	5865	5875	5885	5895	5905	5915	5925	5935	5945	5955	5965	5975	5985	5995	6005	6015	6025	6035	6045	6055	6065	6075	6085	6095	6105	6115	6125	6135	6145	6155	6165	6175	6185	6195	6205	6215	6225	6235	6245	6255	6265	6275	6285	6295	6305	6315	6325	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	6435	6445	6455	6465	6475	6485	6495	6505	6515	6525	6535	6545	6555	6565	6575	6585	6595	6605	6615	6625	6635	6645	6655	6665	6675	6685	6695	6705	6715	6725	6735	6745	6755	6765	6775	6785	6795	6805	6815	6825	6835	6845	6855	6865	6875	6885	6895	6905	6915	6925	6935	6945	6955	6965	6975	6985	6995	7005	7015	7025	7035	7045	7055	7065	7075	7085	7095	7105	7115	7125	7135	7145	7155	7165	7175	7185	7195	7205	7215	7225	7235	7245	7255	7265	7275	7285	7295	7305	7315	7325	7335	7345	7355	7365	7375	7385	7395	7405	7415	7425	7435	7445	7455	7465	7475	7485	7495	7505	7515	7525	7535	7545	7555	7565	7575	7585	7595	7605	7615	7625	7635	7645	7655	7665	7675	7685	7695	7705	7715	7725	7735	7745	7755	7765	7775	7785	7795	7805	7815	7825	7835	7845	7855	7865	7875	7885	7895	7905	7915	7925	7935	7945	7955	7965	7975	7985	7995	8005	8015	8025	8035	8045	8055	8065	8075	8085	8095	8105	8115	8125	8135	8145	8155	8165	8175	8185	8195	8205	8215</

DH510, DH515, DH520, DHM10, DHM15, DHM20, DHM25, DHM30 SERIES

with COOLANT HOLES

Vc = m/min
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc		Parameter	Drill Diameter (mm)							
			10xD 20xD	25xD 30xD		3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0
P	1	Non-alloy steel	120	100	RPM(10xD-20xD)	12730	9550	7640	6370	4770	3820	3180	2730
					RPM(25xD-30xD)	10610	7960	6370	5310	3980	3180	2650	2270
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	2		100	80	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270
					RPM(25xD-30xD)	8490	6370	5090	4240	3180	2550	2120	1820
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	3		80	65	RPM(10xD-20xD)	8490	6370	5090	4240	3180	2550	2120	1820
					RPM(25xD-30xD)	6900	5170	4140	3450	2590	2070	1720	1480
					FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26
	6		100	100	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270
RPM(25xD-30xD)		10610			7960	6370	5310	3980	3180	2650	2270		
FEED		0.08-0.12			0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31		
7	70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590		
			RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360		
			FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26		
8	55	50	RPM(10xD-20xD)	5840	4380	3500	2920	2190	1750	1460	1250		
			RPM(25xD-30xD)	5310	3980	3180	2650	1990	1590	1330	1140		
			FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26		
10	60	50	RPM(10xD-20xD)	6370	4770	3820	3180	2390	1910	1590	1360		
			RPM(25xD-30xD)	5310	3980	3180	2650	1990	1590	1330	1140		
			FEED	0.05-0.09	0.07-0.11	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24		
11	50	45	RPM(10xD-20xD)	5310	3980	3180	2650	1990	1590	1330	1140		
			RPM(25xD-30xD)	4770	3580	2860	2390	1790	1430	1190	1020		
			FEED	0.04-0.08	0.06-0.10	0.07-0.13	0.08-0.14	0.10-0.16	0.12-0.18	0.13-0.19	0.15-0.21		
15	90	75	RPM(10xD-20xD)	9550	7160	5730	4770	3580	2860	2390	2050		
			RPM(25xD-30xD)	7960	5970	4770	3980	2980	2390	1990	1710		
			FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36		
16	70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590		
			RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360		
			FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36		
17	100	80	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270		
			RPM(25xD-30xD)	8490	6370	5090	4240	3180	2550	2120	1820		
			FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36		
18	70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590		
			RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360		
			FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31		
19	80	65	RPM(10xD-20xD)	8490	6370	5090	4240	3180	2550	2120	1820		
			RPM(25xD-30xD)	6900	5170	4140	3450	2590	2070	1720	1480		
			FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36		
20	70	55	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590		
			RPM(25xD-30xD)	5840	4380	3500	2920	2190	1750	1460	1250		
			FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31		



SOLID CARBIDE

DREAM DRILLS
for HIGH HARDENED STEELS

- For High Hardened Steels (HRc 50 - 70)

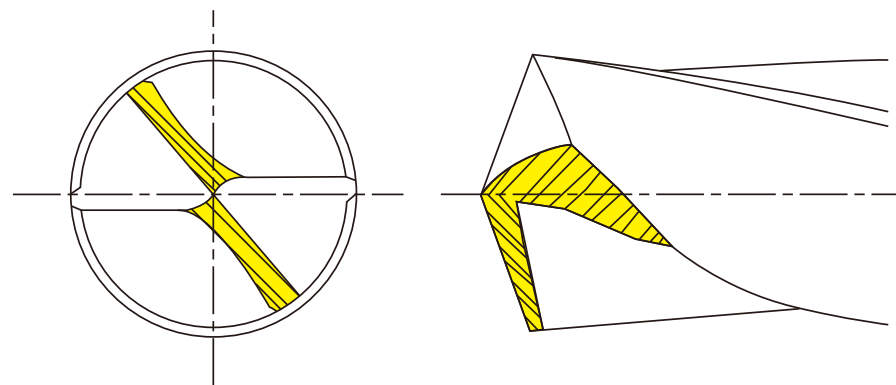
DREAM DRILLS for HIGH HARDENED STEELS

Low Helix

The low Helix angle maximizes tools' rigidity and stability with less deflection

Special Thinning (R+U Thinning)

Unique drill point geometry with special thinning to minimize cutting workload, axial thrust loading and heat generation.



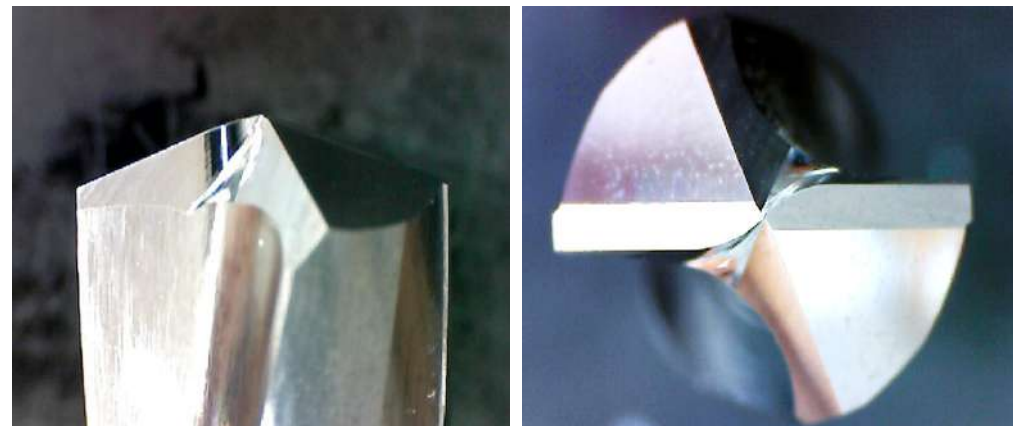
Coating

TiAlN nano coating combines high hardness with high thermal stability against oxidation, allows machining the upper level of hardened steels HRc 50-70.

Polished Flutes

Polished flutes improve coating addition, with better chip control and evacuation.

Point Shape

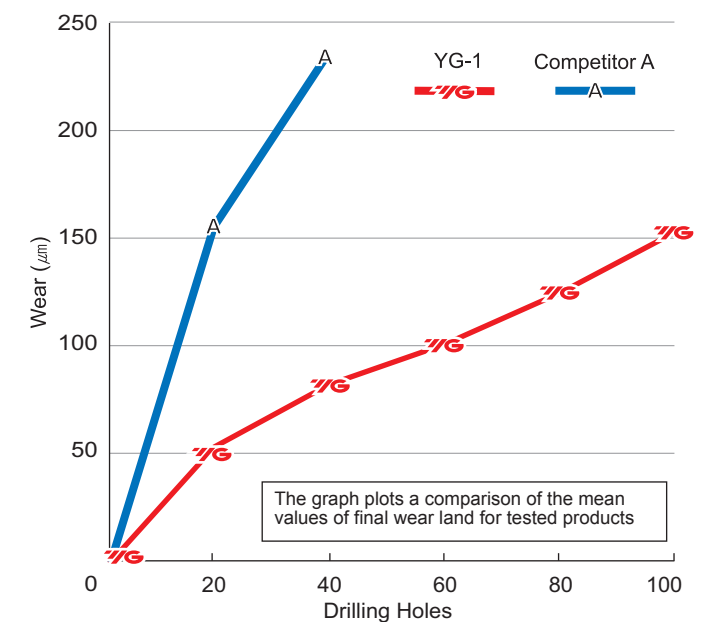


CASE STUDY

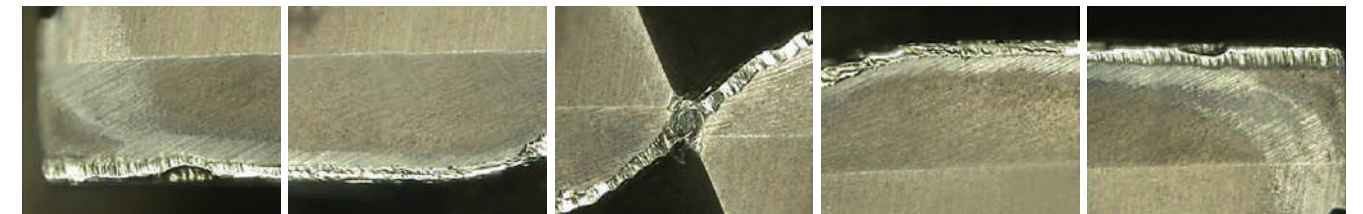
- Low Helix Angle to maximize tools' rigidity.
- Special Point Thinning to improve chip evacuation.
- Excellent Coating and Surface Treatment for improved surface and better chip evacuation.

► SOLID CARBIDE DREAM DRILLS for HIGH HARDENED STEELS (HRc50-70)

CUTTING CONDITION	
Tool	DH500100 (Dream Drills for High Hardened Steels)
Size	Ø10 × Ø10 × 63 × 111
Work Material	• DIN: X155CrV-Mo12-1 • WR: 1.2379 • JIS: SKD11(HRc60)
RPM	380 rev./min.
Feed	0.04 mm/rev.
Drilling Depth	25 mm
Coolant	Wet Cut

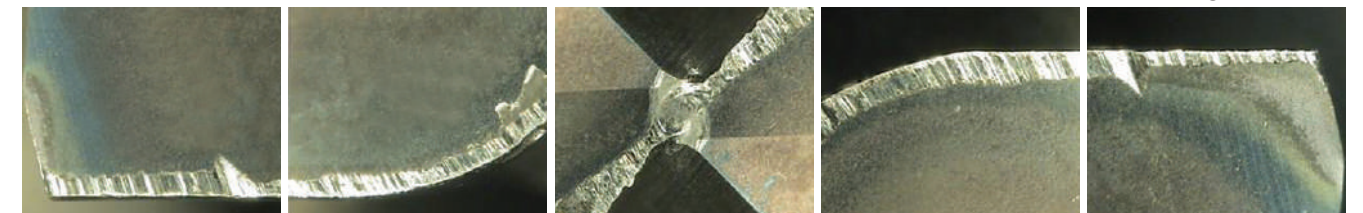


YG-1



After Drilling 100 Holes

Competitor A



After Drilling 40 Holes



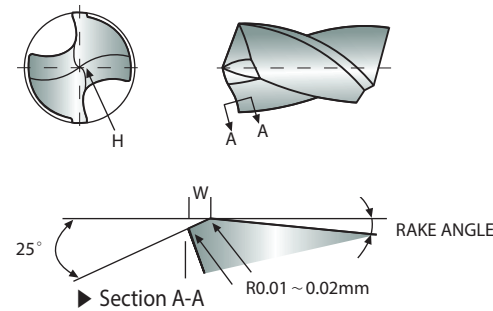
CHARACTERISTIC OF DREAM DRILLS

- YG-1's Dream Drill Series are suitable for high speed and accurate drilling operations by special design and high quality.
- Good performance for Steels, Cast Irons, Tool steels, Alloy steels and Stainless steels, Aluminum and Composite Material.
- Rapid chip evacuation and excellent chip breaking can be achieved by special designed cutting edges on point and chip breakers on leading edges.
- High accuracy and stability.
- Longer tool life with TiAlN coating.
- Self-centering

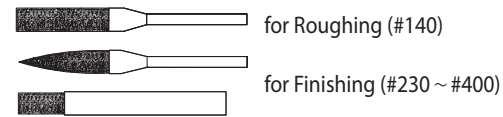


HONING GUIDE OF DREAM DRILLS

■ Dimension of Honing



■ Scraper

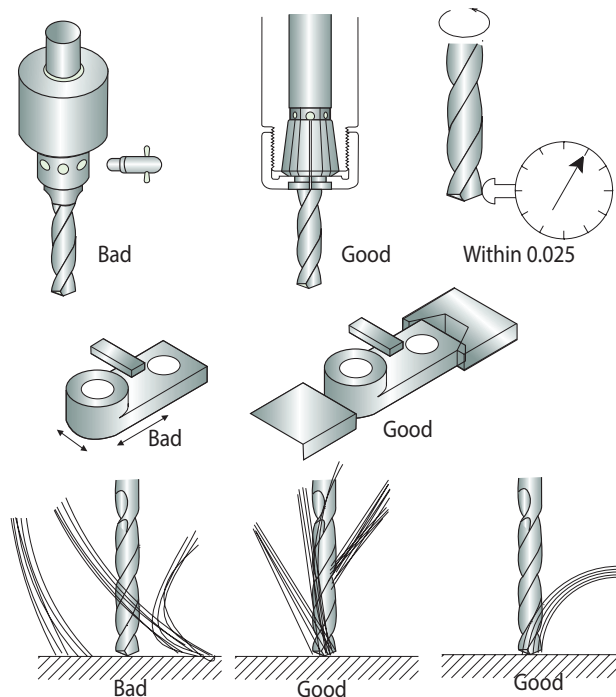


Work Material	Alloy Steels	Mild Steels	Cast Iron
W(mm)	0.15 ~ 0.2	0.1 ~ 0.15	0.03

▶ The dimension W of stocked products is 0.1 ~ 0.15.



USE OF DREAM DRILLS



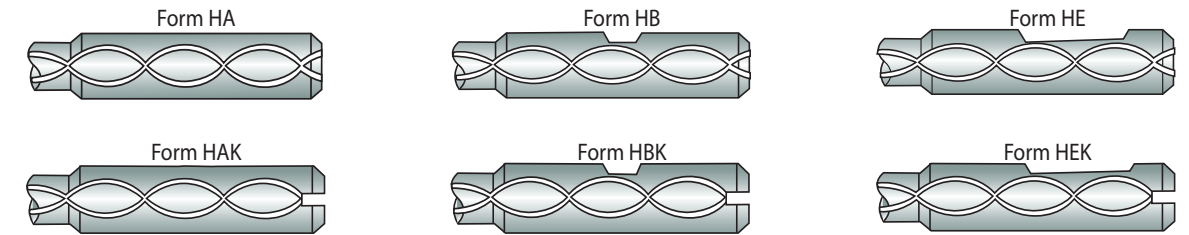
- ▶ Chucking with spring collet correctly.
- ▶ Radial run out at cutting lip must not exceed 0.025 mm.

▶ Tighten clamp of work piece.

- ▶ Supply coolant enough to the entrance of holes.
- ▶ In using Dream Drill with Coolant holes, high pressure coolant is needed.



SHANK TYPE DREAM DRILLS WITH COOLANT HOLES



▶ If you need other Shank Type, we can supply them.



ISO TOLERANCE

$\mu\text{m} = 1/1000\text{mm}$

Diameter (mm)	1 - 3 from to	3 - 6 over to	6 - 10 over to	10 - 18 over to	18 - 30 over to	30 - 50 over to
Tolerance range in μm / Toleranzwerte in μm						
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16
h7	0 - 10	0 - 12	0 - 15	0 - 18	0 - 21	0 - 25
h8	0 - 14	0 - 18	0 - 22	0 - 27	0 - 33	0 - 39
m7	+ 12 + 2	+ 16 + 4	+ 21 + 6	+ 25 + 7	+ 29 + 8	+ 34 + 9

Material Groups

Please visit globalyg1.com/mat for material search



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	Examples	Page
P	1	Non-alloyed steel	About 0.15% C	Annealed	125		S15C, C15, 1015	101
	2		About 0.45% C	Annealed	190	13	S45C, C45, 1045	
	3		About 0.45% C	Quenched & tempered	250	25		
	4		About 0.75% C	Annealed	270	28	SK5, Ck75, 1080	
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low-alloyed Steel		Annealed	180	10		
	7			Quenched & Tempered	275	29	SCM440, 42CrMo4, 410	
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High-alloyed steel, and tool steel		Annealed	200	15	SKD, D2	
	11			Quenched & Tempered	325	35	SKH, SUH, M42	
M	12	Stainless Steel	Ferritic / Martensitic	Annealed	200	15	SUS 420, X40Cr13, 420	108
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10	SUS 316, 316, X5CrNiMo 17 12 2	
K	15	Grey cast iron	Pearlitic / Ferritic		180	10	FC, GG, EN-GJL-250	110
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3	FCD, GGG, EN-GJS-500-7	
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130		FCMW, FCMP, GTS, GJMB350-10	
20	Pearlitic			230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		SAE 1000, AlMg 1, 3.3315	112
	22		Curable	Hardened	100		SAE 7050, AlCuMg 1, 3.1325	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		ADC12, G-AlSi12, 3.2581	
	24		≤ 12% Si, Curable	Hardened	90		C4BS, G-AlSi10Mg, 3.2381	
	25		> 12% Si, Not Curable		130			
	26	Copper and copper alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		CuZn36Pb 3, 2.0375	
	27		CuZn, CuSnZn (Brass)		90		CuZn 15, 2.0240	
	28		CuSn, lead-free copper and electrolytic copper		100		G-CuZn40Fe, 2.0590	
	29	Non-metallic materials	Duroplastic, Fiber Reinforced Plastic				CFRP	
	30		Rubber, Wood, etc.					
S	31	Heat resistant super alloys	Fe Based	Annealed	200	15	X12 NiCrSi 36-16, 1.4864	114
	32			Aged	280	30		
	33			Annealed	250	25	Inconel 718, NiCr20TiAl, 2.4631	
	34		Ni or Co Based	Aged	350	38	NiCu30Al, 2.4375	
	35			Cast	320	34	G-X120Mn12, 1.3401	
	36	Titanium alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050Rm		TiAl6V4, 3.7165	
H	38	Hardened steel		Hardened	550	55	SK3	116
	39			Hardened	630	60		
	40	Chilled cast iron		Cast	400	42		
	41	Hardened cast iron		Hardened	550	55		

Material Groups

Please visit globalyg1.com/mat for material search



Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			Non-alloyed steel			About 0.15% C, Annealed					125	
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0037	STKM 12 C	St 37-2	-	4360 40 B	S235JR	E24-2	1311	Fe 360 B			16D	
1.0038	STKM 12 A	St 37-3	A570.36	4360 40 C	S275J2G3	E28-3	1312	Fe 360 D FF			ST14KP	
1.0045	SM 490 YA	S 355 JR	-	-	S 1207	E36-2	-	Fe 510 BFN				
1.0050	SS 50	St 50-2	A572 Gr. 50	4360 50 B	E 295	A50-2	2172	Fe 490			ST5PS	
1.0060	SM 58	St 60-2	A572 Gr. 65	4360 55 E	-	A60-2	1650	Fe 60-2			ST6PS	
1.0114		S 235 J0	-	En 40C	S 235 J0	E24-3		Fe 360 CFN				
1.0143		S 275 J0	-	-	S 275 J0	E28-3	1414	Fe 430 C				
1.0144	SM41C, SM400	St 44-3 N	A573 Gr. 81	4360 43C	S 275 J2 G3	E28-3	1412	Fe 430 D FF			ST14KP	
1.0149		Ro St 44-2	-	43C	S 275 J0 H	-	1412	Fe430C				
1.0301	S10C	C10	1010	045M10	C10	34C10, XC10		C10	F1511	G10100	10	
1.0330	SPCC	St 12	-	DC 01	Fe P01	DC 01/Fe P01	1142	Fe P01			15KP	
1.0335	SPHE	DD 13 (StW 24)	A622(1008)	H S 3	D D 13	3C		FeP13			08KP	
1.0338	SPCE	St 4	A620(1008)	14491CR	Fe P04	Fe 14	1147	DC04/FeP04			08JU	
1.0345	SPV 50	P235 GH	A516 Gr. 65	P 235 GH	P 235 GH	A 37 CP	1330	Fe E 235		K02503		
1.0401	S15C	C15	1015	080M15	-	C18RR, XC18	1350	C15, C16	F1110	G10170	15	
1.0402	S20C	C22	1020	050 A 20	1 C 22	C20	1450	C 20	F1120	G10200	20	
1.0425	SPV315	P265GH/HII				A42CP	1430	Fe4101KW		K02801	16K	
1.0443	SC 450	GS-45	A2765-35	A1		E23-45M	1305					
1.0539		S355NH				TSE355-4	2134	Fe510B				
1.0545		S355N		4360-50E		E355R	2334	FeE355KG				
1.0546		S355NL		4360-50EE		E355FP	2135	FeE355KT				
1.0547		S355JOH		4360-50C		TSE355-3	2172	Fe510C				
1.0549		S355NLH					2135	Fe510D				
1.0553	SM 520 M	St52-3U	A14880-40	4360-50C		320-560M	1606	Fe510C				
1.0562	SM490A	St E 355	A633 Gr. C	P 355 N		FeE355KGN	2132	Fe E 355 KG		K12000	15GF	
1.0565		W St E 355		P 355 NH		P 355 NH	2106	Fe E 355 KW		K01600		
1.0566	SLA 37	T St E 355		P 355 NL1		P 355 NL1	2107	Fe E 355 KT				
1.0570	SM 50 YA	St 52-3	1	4360-50 C	S355JR	E36-3	2172	Fe 510 B			17G15	
1.0715	SUM22	95Mn28	1213	230M07		S250	1912	CF5Mn28	F2111	G12130		
1.0718	SUM22L	95MnPb28	12L13			S250Pb	1914	CF95MnPb28	F2112	G12134		
1.0721		10S20	1108	10S20		10S20		CF10S20	F2121	G11080		
1.0722		10SPb20	11L08			10PbF2		CF10SPb20		G11084		
1.0736	SUM25	95Mn36	1215			S300		CF9Mn36	F2113	G12150		
1.0737		95MnPb36	12L14			S300Pb	1926	CF95MnPb36	F2114	G12144		
1.0972		S315MC		1501-40F30		E315D						
1.0976		S355MC		1501-43F35		E355D	2642	FeE355TM				
1.0982		S460MC		1501-50F45								
1.0984		S500MC				E490D	2662	FeE490TM				
1.0986		S500MC		1501-60F55		E560D		FeE560TM				
1.1121	S10C	Ck10	1010	040A10		XC10	1265	C10	F1510	G10100	10	
1.1141	S15	Ck15	1015	040A15	32C	XC15	1370	C15	F1110	G10150	15	
1.1151	S20C	C22E	1020	055M15		2C22	1450	C20	F1120	G10230	20	
1.8900	S25C	StE380	A572-60	436055E			2145	FeE390KG				
		St44-2	A36	436043A		NFA35-501E28	1411					
		StE320-3Z		1501160			1421					

Material Groups

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P	VDI 3323 2		Material Description			Composition / Structure / Heat Treatment					HB	HRc
	Non-alloyed steel			About 0.45% C, Annealed					190	13		
Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0501	S35C	C35	1035	080A32		1C35	1572	C35	F.113	G10350	35	
1.0503	S45C	C45	1045	060A47		XC42H1TS	1672	C45	F.114	G10450	45	
1.0511	S40C	C40	1040	080M40		1C40		C40	F.114.A	G10400	40	
1.0540	S50C	C50					1674	C50		G10500		
1.0551		GS-52	A2770-36	A2		280-480M	1505					
1.0553	SM520M	St52-3U	A14880-40	4360-50C		320-560M	1606	Fe510C				
1.0577		S355 J2 G 4	A738	Fe510 D 2 FF		A52FP	2107					
1.0726		35520	1140	212M36	8M	35MF6	1957			G11400	40	
1.0727		45520	1146			45MF4	1973			G11460		
1.1157		40Mn4	1039	150M36	15	40M5				G10390	40G	
1.1158	S25C	C25E	1025	070M25		XC25		C25	F.1120	G10250	25	
1.1166	SMn433H	34Mn5	1536						TO.B	G15360		
1.1167	SMn438(H)	36Mn5	1335	150M36		40M5	2120	36Mn6	F.1203	G13350	35G2	
1.1170	SCMn1	28Mn6	1330	150M28	14A	20M5		C28Mn	28Mn6	G13300	30G	
1.1178	S30C	C30E		080M30		XC32		C30	2C30	G10300		
1.1180		C35R	1035	080A35		3C35	1572		F.1135	G10350		
1.1181	S35C	C35E	1035	080A35		XC38	1572	C36	F.1130	G10340	35	
1.1191	S45C	Cl45	1045	080A46		XC45	1672	C45	F.1140		45	
1.1206	S50C	C50E	1050	080M50		2C50	1674	C50		G10500	50	
1.1213	S50C	Cf53	1050	070M55		XC48HTS	1674	C53		G10500	50	

P	VDI 3323 3		Material Description			Composition / Structure / Heat Treatment					HB	HRc
	Non-alloyed steel			About 0.45% C, Annealed					250	25		
Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0481	SG365	17 Mn 4/P 295 GH	A516 Gr.70	224-460B	P 295 GH	A 48 CP	2102	Fe E 295	A47RCI	K03501	14G2	
1.0501	S35C	C35	1035	080A32		1C35	1572	C35	F.1130	G10350	35	
1.0503	S45C	C45	1045	060A47		XC42H1TS	1672	C45	F.1140	G10450	45	
1.0614		C76D	1074			XC75				G10750		
1.0616		C86D	1086			XC80		C85		G10860		
1.0618		C92D	1095			XC90				G10950		
1.0726		35520	1140	212M36	8M	35MF6	1957			G11400	40	
1.1157		40Mn4	1039	150M36	15	40M5				G10390	40G	
1.1165	SMn433H	30Mn5	1036	120M36		35M5		30Mn5	F8211	K13300	30G2	
1.1167	SMn438(H)	36Mn5	1335	150M36		40M5	2120	36Mn6	F.1203	G13350	35G2	
1.1186	S40C	C40E	1040	060A40		2C40		C40		G10400		
1.1191	S45C	Cl45	1045	080M46		2C45	1672	C45	F.1140		45	
1.1201	S50C	C45R	1049	080M46		3C45	1660	C45	F.1145		38HM	
1.1213	S50C	Cf53	1050	070M55		XC48HTS	1674	C53		G10500	50	
1.7242	SCM418 H	18CrMo4										
1.7337		16CrMo4-4	A387 Gr.12					A18CrMo45KW		K11564	15CM	
1.7362	SCMV 6	12CrMo195		3606-625		Z10CD5-05		16CrMo205		K41545		
		17MnV6	A572-60	436055E		NFA35-501E36	2142					

Material Groups

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P	VDI 3323 4		Material Description			Composition / Structure / Heat Treatment					HB	HRc
	Non-alloyed steel			About 0.75% C, Annealed					270	28		
Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0603	S70 C-CSP	C67	107	080A67		XC65		C67		G10700		
1.0605		C75	1075	144980HS				C75		G10740	75	
1.1203	S55C	Cl55	1055	060A57		2C55	1655	C55	F.1150	G10550	55	
1.1209		C55R	1055	070M55		3C55		C55	F.1155	G10550		
1.1221	S58C	Cl60	1060	060A62	43D	2C60	1678	C60	F.1150	G10640	60	
1.1231	S70 C-CSP	C67E	1070	060A67		XC68	1770	C70	F.5103	G10700	65GA	
1.1248	C75	C75E	1074	060A78		XC75	1774	C75	F.5107	G10800	75(A)	
1.1269	SK5-CSP	C85E	1086			XC90		C90		G10900	85(A)	
1.1274	SUP4	Cl101	1095	060 A96	C 100S	XC100	1870	C100	F.5117	G10950		
1.1545	SK3	C105W1	W1	BW 2	C 105U	Y1 105	1880	C 100 KU	F.5118		U10A	
1.1663	SK2	C125W	W112			Y2120					U13	

P	VDI 3323 5		Material Description			Composition / Structure / Heat Treatment					HB	HRc
	Non-alloyed steel			About 0.75% C, Quenched & Tempered					300	32		
Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0070		St70-2	1055	Fe690-2FN	-	A70-2	1655	Fe 690	F.1150		55	
1.0535	S55C	C55	1055	070M55		1C55	1655	C55		J05000	55	
1.0601	S58C	C60	1060	060A62	43D	1C60		C60		G10600	60(G)	
1.1203	S55C	Cl55	1055	060A57		2C55	1655	C55	F.1150	G10550	55	
1.1221	S58C	Cl60	1060	060A62	43D	2C60	1678	C60	F.1150	G10640	60	
1.1274	SUP4	Cl101	1095	060 A96	C 100S	XC100	1870	C100	F.5117	G10950		
1.1545	SK3	C105W1	W1	BW 2	C 105U	Y1 105	1880	C 100 KU	F.5118		U10A	
1.1663	SK2	C125W	W112			Y2120					U13	
1.5120		38MnSi4										
1.5710	SNC236	36NiCr6	3135	640A35	111A	35NC6						
1.7701		51CrMoV4						51CrMoV4				

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			Low-alloyed Steel			Annealed					180	10
VDI 3323 6			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0116		St 37-3	A570 Gr.36	4360-40C	S 235 J2 G3	E24-3	1312	Fe 360 D1(2)	AE235D		ST3KP	
1.0904	SKH 1, SKT 4	55Si7	9255	250A53	45	55S7	2085	55Si8	56Si7	G92550	55S2	
1.0961	SUP 7	60SiCr7	9262			60SC6		60SiCr8	60SiCr8	G92620		
1.2067		100Cr6	L3	BL3		Y100C6				100Cr6		
1.2108		90CrSi5	L1				2092	105WCR5				
1.2210		115CrV3	L2				100C3	107CrV3KU	F520L		11KHF	
1.2241		51CrV4										
1.2330	SCM435TK	35CrMo4	4135	708A37		34CD4	2234	35CrMo4			35KHM	
1.2419	SKS31	105WCr6		105WC13		105WC13	2140	10WCr6			CWG	
1.2510	SKS3	100MnCrW4	O1	BO1		90 MWCV 5	2140	95 MnWCr 5 KU	F5220		9KHVG	
1.2542		45WCrV7	S1	BS1			2710	45WCrV8KU			5CW25F	
1.2550		60WCrV7	S1			55WC20	2710	58WCr9KU			5KHV25F	
1.2713	SKT4	55NiCrMoV6	L6			55NCDV7			F520S		5C NM	
1.2721		50NiCr13	L6			55NVC6	2550		F528			
1.2842		90MnCrV8	O2	BO2		90MV8				T31502	9G2F	
1.3501		100Cr2	E50100									
1.3505	SUJ2	100Cr6	52100	2S135	31	100C6	2258	100Cr6	F1310		SCC 15	
1.5024		46Si7				45S7		46Si7	F1451			
1.5025		51Si7	9259H		50Si7	51S7	2090	50Si7	F1450			
1.5026		55Si7			56Si7	55S7	2085	55Si7	F1440	G92550	55S2	
1.5027		60Si7	9260	251A60	60Si7	60S7		60Si7	F1441	G92600	60S2	
1.5028	SUP7	65Si7	9260H									
1.5415	STFA 12	15Mo3	A204Gr.A	1503-243B		15D3	2912	16Mo3(KG)	F2601	K11820		
1.5419	SCPH11	20Mo4	4419	1503-243-430			2512	G20Mo5		G44190		
1.5423	SB450M	16Mo5	4520	1503-245-420				16Mo5(KG)	F2602	K11522		
1.5622		14Ni6	A350-LF5			16N6		14Ni6(KG)	F2641			
1.5732	SNC415(H)	14NiCr10	3415			14NC11		16NiCr11				
1.5752	SNC815(H)	14NiCr14	3310	655M13	36A	12NC15					20X2H4A	
1.6511	SUP10	36CrNiMo4	9840	816M40	110	40NCD3		36NiCrMo4(KB)			40C N2MA	
1.6523	SNCM220(H)	21NiCrMo2	8620	805M20	362	20NCD2	2506	20NiCrMo2			20C GNM	
1.6546	SNCM240	40NiCrMo2-2	8740	311-Tyre7				40NiCrMo2(KB)			38C GNM	
1.6566		17NiCrMo6-4										
1.6587		17CrNiMo6		820A16		18NCD6		14NiCrMo13				
1.6657		10NiCrMo13-4						14NiCrMo131				
1.7015	SCr415(H)	10Cr3	5015	523M15		12C3				G50150	15C	
1.7033	SCr430(H)	34Cr4	5132	530A32	18B	32C4		34Cr4(KB)		G51300	35C	
1.7035	SCr440(H)	41Cr4	5140	530M40	18	42C4	2245	41Cr4		G51400	40H	
1.7131	SCR 415	16MnCr5	5115	527M17		16MCS	2511	16MnCr5		G51150	12KHN2	
1.7139		16MnCr55					2127				18HG	
1.7176	SUP9(A)	55Cr3	5155	527A60	48	55C3	2253	55Cr3			50C GA	
1.7218	SCM420	25CrMo4	4130	CDS110		25CD4	2225	25CrMo4(KB)			20C M	
1.7220	SCM432	34CrMo4	4135	708 A 37		35CD4	2234	34CrMo4			35C M	
1.7223	SNB22-1	41CrMo4	4142					41CrMo4			40C FA	
1.7225	SCM 440 (H)	42CrMo4	4140	708 M 40	42 CrMo 4	42 CD 4	2244	42 CrMo 4	F.1252		38HM	
1.7228		55NiCrMoV6G		823M30	33		2512	653M31				
1.7262	SCM415(H)	15CrMo5				12CD4	2216	12CrMo4				
1.7321		20mOcr4					2625					
1.7335	SCM415(H)	13CrMo4-4	A182-F11	1501-620		15CD4-5	2216	14CrMo45			12C M	
1.7361		32CrMo12		722M24	40B	30CD12	2240	30CrMo12	F.124A			
1.7380		10CrMo9-10	A182F22	1501-622		12CD9-10	2218	12CrMo9			12KH8	

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			Low-alloyed Steel			Annealed					180	10
VDI 3323 6			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.7715		14MoV6-3						1503-660-440			13MoCrV6	
1.8159	SUP 10	50CrV4	6150	735A50	47	50CrV4	2230	50CrV4		G61500	50C GFA	
1.8161		58CrV4										
1.8509	SACM 645	41CrAlMo7	A355A	905M39	41B	40CAD6-12	2940	41CrAlMo7				
1.8523		39CrMoV13-9		897M39	40C						36CrMoV12	

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			Low-alloyed Steel			Quenched & Tempered					275	29
VDI 3323 7			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.5415	STFA 12	15Mo3	A204Gr.A	1503-243B		15D3	2912	16Mo3(KG)	F2601	K11820		
1.5423	SB450M	16Mo5	4520	1503-245-420				16Mo5(KG)	F2602	K11522		
1.5622		14Ni6	A350-LF5			16N6		14Ni6(KG)	F2641			
1.5732	SNC415(H)	14NiCr10	3415			14NC11		16NiCr11				
1.5752	SNC815(H)	14NiCr14	3310	655M13	36A	12NC15					20X2H4A	
1.5755	SNC236	31NiCr14		653M31		18NC13	2534		F.1270			
1.6565	SNCM447	40NiCrMo6	4340	817M40	24	35NCD6	2541	35NiCrMo6(KB)			38C 2N2MA	
1.6587		17CrNiMo6		820A16		18NCD6		14NiCrMo13				
1.6657		10NiCrMo13-4						14NiCrMo131				
1.6957		26NiCrMoV14-5										
1.7015	SCr415(H)	10Cr3	5015	523M15		12C3				G50150	15C	
1.7262	SCM415(H)	15CrMo5				12CD4	2216	12CrMo4				
1.7335	SCM415(H)	13CrMo4-4	A182-F11	1501-620		15CD4-5	2216	14CrMo45			12C M	
1.7380		10CrMo9-10	A182F22	1501-622		12CD9-10	2218	12CrMo9			12KH8	
1.7715		14MoV6-3		1503-660-440							13MoCrV6	
1.7733		24CrMoV55				20CDV6		21CrMoV511				
1.7755		GS-45CrMoV10-4										
1.8070		21CrMoV511						35NiCr9				

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			Low-alloyed Steel			Quenched & tempered					300	32
VDI 3323 8			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.1730		C45W3	C45W			XC48						
1.2332	SCM(440)	47CrMo4	4142	708M40	19A	42CD4	2244	42CrMo4				
1.5736	SNC 631 (H)	36NiCr10	3435			30NC11						
1.6523	SNCM220(H)	21NiCrMo2	8620	805M20	362	20NCD2	2506	20NiCrMo2			20C GNM	
1.7033	SCr430(H)	34Cr4	5132	530A32	18B	32C4		34Cr4(KB)		G51300	35C	
1.7218	SCM420	25CrMo4	4130	CDS110		25CD4	2225	25CrMo4(KB)			20C M	
1.8515		32CrMo12		722M24	40B	30CD12	2240	32CrMo12	F.124A			

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0904	SKH 1, SKT 4	55Si7	9255	250A53	45	55S7	2085	55S8		G92550	55S2	
1.0961	SUP 7	60SiCr7	9262			60SC6		60SiCr8		G92620		
1.2067		100Cr6	L3	BL3		Y100C6		100Cr6				
1.2419	SKS31	105WCr6		105WC13		105WC13	2140	10WCr6			CWG	
1.2542		45WCrV7	S1	BS1			2710	45WCrV8KU			5CW25F	
1.2713	SKT4	55NiCrMoV6	L6						F520S		5C NM	
1.4882		X50CrMnNiNbN219				Z50CMNNb21-09						
1.5120		38MnSi4										
1.5710	SNC236	36NiCr6	3135	640A35	111A	35NC6						
1.5755	SNC236	31NiCr14		830m31		18NC13	2534		F1270			
1.6511	SUP10	36CrNiMo4	9840	816M40	110	40NCD3		36NiCrMo4(KB)			40C N2MA	
1.6546	SNCM240	40NiCrMo2-2	8740	311-Tyre7				40NiCrMo2(KB)			38C GNM	
1.7035	SCR440(H)	41Cr4	5140	530M40	18	42C4	2245	41Cr4		G51400	40H	
1.7176	SUP9(A)	55Cr3	5155	527A60	48	55C3	2253	55Cr3			50C GA	
1.7220	SCM432	34CrMo4	4135	708Aa37		35CD4	2234	34CrMo4			35C M	
1.7223	SNB22-1	41CrMo4	4142					41CrMo4			40C FA	
1.7225	SCM 440 (H)	42CrMo4	4140	708 M 40	42 CrMo 4	42 CD 4	2244	42 CrMo 4	F.1252		38HM	
1.7361		32CrMo12		722M24	40B	30CD12	2240	30CrMo12	F.124A			
1.8159	SUP 10	50CrV4	6150	735A50	47	50CrV4	2230	50CrV4	51CrV4	G61500	50C GFA	
1.8161		58CrV4										
1.8509	SACM 645	41CrAlMo7	A355A	905M39	41B	40CAD6-12	2940	41CrAlMo7				
1.8523		39CrMoV13-9		897M39	40C			36CrMoV12				

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.0347	SPCD	RR St 3	A619	CR 3	Fe P03	F 13		DC03/FeP03			08JU	
1.0723	SUM32	15S22		210A15			1922		F210F			
1.2080	SKD1	X210Cr12	D3	BD3	X210Cr12	Z200C12		X205Cr12KU		T30403	KH12	
1.2162	SCR 420 H	21MnCr5				20MC5						
1.2311		40CrMnMo7				40CMD8		35cRm08KU				
1.2312		40CrMnMoS8.6	P20+S			40CMD8S						
1.2316		X36CrMo17			X38CrMo16							
1.2343	SKD 6	X38CrMoV5-1	H11	BH11		Z38CDV5		X37CrMoV51KU		T20811	4C 5MFS	
1.2344	SKD61	X40CrMoV5-1	H13	BH13		Z40CDV5	2242	X40CrMoV511KU	F5318	T20813	4C 5MF1S	
1.2363	SKD12	X100CrMoV5-1	A2	BA2		Z100CDV5	2260	X100CrMoV51KU	F5227		9KH5VF	
1.2379	SKD11	X155CrVMo121	D2	BD2		Z160CDV12	2310	X165CrMoW12KU		T30402	KH12MF	KRUPP2379
1.2436	SKD 2	X210CrW12	D4(D6)	BD6		Z200CD12	2312	X215CrW121KU	F5213		KH12	

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.2510	SKS3	100MnCrW4	O1	BO1		90MWCV 5	2140	95 MnWCr 5 KU	F5220		9KHVG	
1.2581	SKD5	X30WCrV9-3	H21	BH21		Z30WCV9		X30WCrV93KU	F526	T20821	3C 2W8F	
1.2601		X165CrMoV12					2310	X160CrMoV12			KH12MF	
1.2606	SKD 62	X37CrMoW51	H12	BH12		Z35CWDV5		X35CrMoW05KU	F537	T20812	5C NM	
1.2764		X19NiCrMo4										
1.2767		X45NiCrMo4				45NCD16		40NiCrMo8VKU				
1.2842		90MnCrV8	O2	BO2		90MV8		90MnVCr8KU		T31502	9G2F	
1.3243	SKH55	S6-5-2-5	T15			KCV06-05-05-04-02	2723	HS6-5-2-5			R6M5K5	
1.3249	SKH 3	S18-1-2-5	T4	BT4		Z80WKCV18-05-04					R18K5F2	
1.3343	SKH51, SKH9	S6-5-2	M2	BM2		Z85WDCV	2722	HS652	F5604		R6M5	
1.3348	SKH 58	S2-9-2	M7			Z100DCWV09-04-02	2782	HS292	F5607			
1.3355	SKH 2	S18-0-1	T1	BT1		Z80WCV18-4-01					R18	
1.4718	SUH1	X45CrSi9-3	HNV3	401S45	52	Z45CS9		X45CrSi8	F322		40C 9S2	
1.5662	SL9N60(53)	X8Ni9	ASMA353	502-650		9Ni		X10Ni9	F2645			
1.5680		12Ni19	2515	12Ni19		Z18N5						

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands
1.2080	SKD1	X210Cr12	D3	BD3	X210Cr12	Z200C12		X205Cr12KU		T30403	KH12	
1.2344	SKD61	X40CrMoV5-1	H13	BH13		Z40CDV5	2242	X40CrMoV511KU	F5318	T20813	4C 5MF1S	
1.2363	SKD12	X100CrMoV5-1	A2	BA2		Z100CDV5	2260	X100CrMoV51KU	F5227		9KH5VF	
1.2436	SKD 2	X210CrW12	D4(D6)	BD6		Z200CD12	2312	X215CrW121KU	F5213		KH12	
1.2581	SKD5	X30WCrV9-3	H21	BH21		Z30WCV9		X30WCrV93KU	F526	T20821	3C 2W8F	
1.2601		X165CrMoV12					2310	X160CrMoV12			KH12MF	
1.2714	SKT 4	55NiCrMoV7	6F3/L6							F520S	5KHNV	
1.3202		S12-1-4-5		BT15				HS12-1-5-5				
1.3207		S10-4-3-10		BT42		Z130WKCDV						
1.3243	SKH55	S6-5-2-5	T15			KCV06-05-05-04-02	2723	HS6-5-2-5			R6M5K5	
1.3246		S7-4-2-5	M35			Z110WKCDV07-05-04		HS7-4-2-5				
1.3247	SKH 51	S2-10-1-8	M42	BM42		Z110DKCWW09-08-04		HS2-9-1-8			R2AM9K5	
1.3255	SKH 3	S18-1-2-5	T4	BT4		Z80WKCV18-05-04					R18K5F2	
1.3343	SKH51, SKH9	S6-5-2	M2	BM2		Z85WDCV	2722	HS652	F5604		R6M5	
1.3348	SKH 58	S2-9-2	M7			Z100DCWV09-04-02	2782	HS292	F5607			
1.3355	SKH 2	S18-0-1	T1	BT1		Z80WCV18-4-01					R18	
1.4718	SUH1	X45CrSi9-3	HNV3	401S45	52	Z45CS9		X45CrSi8	F322		40C 9S2	
1.4935	SUH 616	X20CrMoWV121	422							S42200		
1.5680		12Ni19	2515	12Ni19		Z18N5						

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	Stainless steel						
1.4000	SUS403	X6Cr13	403	403S17		Z6C13	2301	X6Cr13	F3110	S40300	08C 13	ATI 410S
1.4001		X7Cr14	410 S	403S7		Z8C13	2301		F8401		08C 13	
1.4002	SUS 405	X6CrAl13	405	405S17		Z6CA13	2302	X6CrAl13		S40500		
1.4005	SUS416	X12CrS13	416	416S21		Z11CF13	2380	X12CrS13	F3411	S41600		ATI 416
1.4006	SUS410	X12Cr13	410	410S21	56A	Z10C13	2302	X12Cr13	F3401	S41000	12C 13	ATI 410
1.4016	SUS430	X6Cr17	430	430S15	X8Cr17	Z8C17	2320	X8Cr17	F3113	S43000	12C 17	ATI 430
1.4027	SCS 2	GX20Cr14		420C29		Z20C13M					20C 13L	
1.4028	SUS420J2	X30Cr13	420	420S45		Z30C13	2304			S42020	20C 13	
1.4034	SUS420J2	X46Cr13		420S45		Z40C14		X40Cr14	F3405			
1.4057	SUS431	X19CrNi17-2	431	431S29	57	Z15CN16-02	2321	X16CrNi16	F3427	S43100	20C 17N2	431 (HT)
1.4086		GX120Cr29		452C11								
1.4104	SUS430F	X12CrMoS17	430F	420S37		Z10CF17	2383	X10CrS17	F3117	S43020		
1.4112	SUS 440 B	X90CrMoV18	440B							S44003	95KH18	
1.4113	SUS434	X6CrMo17	434	434S17		Z8CD17-01	2325	X8CrMo17		S43400		AL 434
1.4313	SCS5	X3CrNi13-4	CA6-NM	425C11		Z4CND13-04M	2385	(G)X6CrNi304		J91540		
1.4340		GX40CrNi274								J92615		
1.4417		X2CrNiMoSi195	S31500							2376		
1.4418		X4CrNiMo165				Z6CND16-04-01	2387			S39215		APX4
1.4510	SUS430LX	X6CrTi17	XM8			Z4CT17		X6CrTi17	F3115	S43035	08C 17T	430 Ti
1.4511	SUS430LK	X6CrNb17				Z4CNb17		X6CrNb17	F3122			AXCS25
1.4512	SUH409	X6CrTi12	409	LW19		Z3CT12		X6CrTi12		S40900		
1.4720		X20CrMo13										
1.4724	SUS 405	X10CrAl13	405	403S17		Z10C13		X10CrAl12	F311		10C 13SJU	
1.4742	SUS430	X10CrAl18	430	439S15	60	Z10CAS18		X8Cr17	F3113	S43000	15C 13SJU	
1.4747	SUH4	X80CrNiSi20	HNV6	443S65	59	Z80CSN20-02		X80CrSiNi20	F320B	S65006		
1.4749		X18CrN28	446								15KH28	
1.4762	SUH446	X10CrAl24	446			Z10CAS24	2322	X16Cr26		S44600		
1.4871	SUH35,SUH36	X53CrMnNiN21-9	EV8	349S54		Z52CMN21-09		X53CrMnNiN219		S63008	55C 20G9AN4	
		X10CrNi15	429									
		X12CrNi18-9	302	302S31		Z10CN18-09	2330					

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	Stainless steel						
1.4000	SUS403	X6Cr13	403	403S17		Z6C13	2301	X6Cr13	F3110	S40300	08C 13	ATI 410S
1.4001		X7Cr14	410 S	403S7		Z8C13	2301		F8401		08C 13	
1.4006	SUS410	X12Cr13	410	410S21	56A	Z10C13	2302	X12Cr13	F3401	S41000	12C 13	ATI 410
1.4016	SUS430	X6Cr17	430	430S15	X8Cr17	Z8C17	2320	X8Cr17	F3113	S43000	12C 17	ATI 430
1.4021	SUS 420J1	X20Cr13	420	420S37		Z20C13	2303	14210	F5261	S42000	20C 13	ATI 420
1.4027	SCS 2	GX20Cr14		420C29		Z20C13M					20C 13L	
1.4031	SUS 420J2	X40Cr13	420			Z40C14	-2304		F3404	S42080	40C 13	
1.4034	SUS420J2	X46Cr13		420S45		Z40C14		X40Cr14	F3405			
1.4057	SUS431	X19CrNi17-2	431	431S29	57	Z15CN16-02	2321	X16CrNi16	F3427	S43100	20C 17N2	431 (HT)
1.4104	SUS430F	X12CrMoS17	430F	420S37		Z10CF17	2383	X10CrS17	F3117	S43020		
1.4113	SUS434	X6CrMo17	434	434S17		Z8CD17-01	2325	X8CrMo17		S43400		AL 434
1.4313	SCS5	X3CrNi13-4	CA6-NM	425C11		Z4CND13-04M	2385	(G)X6CrNi304		J91540		
1.4544		A 700	321	S524		Z 10 CNT 18 11		X6CrNiTi1811		J92630	08C 18N12T	
1.4546		X5CrNiNb18-10	348	347S31				X6CrNiNb1811		J92640		ATI 348
1.4871	SUH35,SUH36	X53CrMnNiN21-9	EV8	349S54		Z52CMN21-09		X53CrMnNiN219		S63008	55C 20G9AN4	
1.4922		X20CrMnV12-1					2317	x20CrMnV1201				
1.4923		X22CrMoV121										Jethete X20

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRC
			AISI/ASTM/SAE	BS	EN	Stainless steel						
1.4301	SUS 304	X5CrNi18-10	304	304S15		Z5CN18-09	2332		F3551	S30409	08C 18N10	
1.4305	SUS303	X10CrNiS18-10	303	303S21	58M	Z8CNF18-09	2346	X10CrNiS18.09	F3508	S30300	30C 18N11	ATI 303
1.4306	SCS19	X2CrNi1911	304L	304C12	X3CrNi1810KD	Z2CN18-09	2352	GX2CrNi1910	F3503	S30403	03KH18N11	ATI 304L
1.4308	SUS304L	GX6CrNi18-9	CF-8	304C15	58E	Z6CN18-10M	2333					CF-8
1.4310	SUS 301	X10CrNi18-8	301	301S21		Z12CN17-07	2331	X2CrNi1807	F3517	S30100	07KH16N6	ATI 301
1.4311	SUS304LN	X2CrNi18 10	304LN	304S62		Z2CN18-10	2371	X2CrNi1810	F3541	S30453	03KH18N11	
1.4312	SCS12	GX10CrNi188	305	302C25		Z10CN18-9M					10C 18N9L	ATI 305
1.4350	SUS304	X5CrNi18-9	304	304S15	58E	Z6CN18-09	2332	X5CrNi1810	F3551	S30400		ATI 304
1.4362		X2CrNiN234	S32304			Z2CN23-04AZ	2327			S32304		ATI 2304TM
1.4371		X3CrMnNi18887	202	284S16		Z8CMN18-08-05						
1.4401	SUS316	X5CrNiMo17-12-2	316	316S13		Z3CND17-11-01	2347	X5CrNiMo17 12 2	F3534	S31600	08KH17H13M2T	ATI 316
1.4404	SUS316L	X2CrNiMo17-13-2	316L	316S11		Z2CND17-12	2348	X2CrNiMo1712	F3533	S31603		ATI 316L
1.4406	SUS316LN	X2CrNiMoN17122	316LN	316S61		Z2CND17-12AZ		X2CrNiMoN1712	F3542	S31653	07C 18N	ATI 316LN
1.4408	SCS14	GX6CrNiMo18-10	CF-8M	316C16			2343	X7CrNiMo2010	F8414	J92900	10G252MSL	
1.4410	SCS 14 A	GX10CrNiMo18-9				Z5CND20-12M	2328				S32750	
1.4429	SUS316LN	X2CrNiMoN17-13-3	316Ln	316S62		Z2CND17-13AZ	2375	X2CrNiMoN17133	F3543		03KH16N15M3	
1.4435	SUS316L	X2CrNiMo18143	316L	316S11		Z3CND17-12-03	2375	X2CrNiMo17 13 2	F3533	S31603	03C 17N14M3	
1.4436	SUS316	X3CrNiMo17-13-3	316	316S19		Z6CND18-12-03	2343	X5CrNiMo17 12 2	F3543	S31600		
1.4438	SUS317L	X2CrNiMo18164	317L	317S12		Z2CND19-15-04	2367	X2CrNiMo18 16 4	F3539	S31703		ATI 317L
1.4439		X2CrNiMoN17135	(s31726)			Z3CND18-14-06AZ						
1.4440		X2CrNiMo18-16										
1.4449	SUS317	X5CrNiMo17133	317	317S16				X5CrNiMo1815		S31700		ATI 317
1.4460	SUS 329 J1	X8CrNiMo275	329				2324			S32900		10RE51
1.4462	SUS329J3L	X2CrNiMoN2253		318S13		Z3CND22-05Az	2377			S31803		ATI 2205TM
1.4500		X7NiCrMoCuNb2520				Z3NCDU25-20M					J95150	
1.4521	SUS444	X2CrMoTi18-2	443444				2326	X2CrMoTiNb18 2	F3123			
1.4539		X1NiCrMoCuN25205				Z2NCDU25-20	2562			N08904		ATI 904L
1.4541	SUS321	X14CrNiTi18-10	321	321S31		Z6CNT18-10	2337	X6CrNiTi18 11	F3523	S32100	06C 18N10T	ATI 321
1.4542	SUS630	X5CrNiCuNb174	630			Z7CNU15-05						UGIMA 4542
1.4545		Z7CNU15.05	15-5PH								S15500	ATI 15-5
1.4547		X1CrNiMoN20187	S31254				2378			S31254		Uranus B25 6Mo
1.4550	SUS347	X6CrNiNb18-10	347	347S17	58F	Z6CNNb18-10	2338	X6CrNiNb 18 11	F3552	S34700	08C 18N12B	ATI 347
1.4552	SCS 21	GX7CrNiNb18-9				Z4CNNb19-10M					J92710	
1.4568	SUS 631	X7 CrNiAl 17 7		316S111		Z9 CAN 17-7	2388	Z8CNA17-07		S17700	09C 17NJU1	17-7PH
1.4571	SUS 316Ti	X6CrNiMoTi17-12-2	316Ti	320S31	58J	Z6NDT17-12	2350	X6CrNiMoTi17 12	F3535		10C 17N13M2T	ATI 316Ti
1.4581	SCS 22	GX5CrNiMoNb18		318C17		Z4CNDNb18-12M						
1.4583		X6CrNiMoNb18-12	318	303S21		Z15CNS20-12		X15CrNiSi2 12				
1.4585		GX7CrNiMoCuNb1818						X6CrNiMoTi17 12			J94651	
1.4821		X20CrNiSi254				Z20CNS25-04					S44635	
1.4823		GX40CrNiSi274									J92605	
1.4828	SCS17	X15CrNiSi20-12	309	309S24	58C	Z15CNS20-12			F8414	S30900	20C 20N14S2	ATI 309
1.4833	SUS 309 S	X6CrNi2213	309S	309S13		Z15CN24-13					J93400	
1.4845	SUH310	X12CrNi25-21	310S	310S24		Z12CN25-20	2361	X6CrNi252				

Material Groups

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Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 15 Grey cast iron Pearlitic / Ferritic HB 180 HRc 10</p>													
0.6010	FC100	GG10	A48 20 B	Grade 100	GJL-100	Ft 10 D	0100	G10	FG10		Sc 10		
0.6015	FC150	GG15	A48 25 B	Grade 150	GJL-150	Ft 15 D	0115	G15	FG15		Sc 15		
0.6020	FC200	GG20	A48 30 B	Grade 220	GJL-200	Ft 20 D	0120	G20	FG20	W06020	Sc 20		
0.6025	FC250	GG25	A48 40 B	Grade 260	GJL-250	Ft 25 D	0125	G25	FG25		Sc 25		
0.6660		GGL-NiCr 20.2	1050/700/7	Grade F2	GJLA-XNiCr 20-2	L-NC 202	0523	-		F41002	Ni-Resist 2		
1.4449	SUS317	X5CrNiMo17133	317	317S16				X5CrNiMo1815		S31700	ATI 317		

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 16 Grey cast iron Pearlitic (Martensitic) HB 260 HRc 26</p>													
0.6025	FC250	GG25	A48 40 B	Grade 260	GJL-250	Ft 25 D	0125	G25	FG25		Sc 25		
0.6030	FC300	GG30	A48 45 B	Grade 300	GJL-300	Ft 30 D	0130	G30	FG30		Sc 30		
0.6035	FC350	GG35	A48 50 B	Grade 350	GJL-350	Ft 35 D	0135	G35	FG35		Sc 35		
0.6040	FC400	GG40	A48 60 B	Grade 400	GJL-400	Ft 40 D	0140	G40	FC40		Sc 40		

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 17 Nodular cast iron Ferritic HB 160 HRc 3</p>													
0.7033	FCD350-22L	GGG35.3	-	350/22L40	GJS-350-22-LT	FGS 370-17	0717-15	-					
0.7040	FCD400	GGG40	60-40-18	SNG 420-12	GJS-400-15	FCS 400-12	0717-02	GS 400-12	FG E38-17	F32800	Vc 42-12		
0.7043	FCD 370	GGG40.3	60-40-18	SNG 370-17	GJS-400-18-LT	FGS 370-17	0717-12	GSO 42-17			Vc 42-12		
0.6040	FC400	GG40	A48 60 B	Grade 400	GJL-400	Ft 40 D	0140	G40	FC40		Sc 40		

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 18 Nodular cast iron Pearlitic HB 250 HRc 25</p>													
0.7050	FCD500	GGG50	80-55-06	SNG 500-7	GJS-500-7	FGS 500-7	0727-02	GS 500-7	FG E50-7	F33100	Vc 50-2		
0.7060	FCD600	GGG60	80-55-06	SNG 600-3	GJS-600-3	FGS 600-3	0732-03	GS 600-3	FG E60-2		Vc 60-2		
0.7070	FCD700	GGG70	100-70-03	SNG 700-2	GJS-700-2	FGS 700-2	0737-01	GS 700-2	FG S70-2	F34800	Vc 70-2		
0.7652	FCDA-NiMn 13.7	GGG NiMn 13-7	-	Grade S6	GJSA-XNiMn 13-7	FGS Ni13 Mn7	0772	-			Nodumag		
0.7660		GGG NiCr 20-2	A436 D2	Grade S2	GJSA-XNiCr 20-2	FGS Ni20 Cr2	0776	-			Ni-Resist D-2		

Material Groups

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Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 19 Malleable cast iron Ferritic HB 130 HRc</p>													
0.8135	FCMW330	GTS-35	32510	B 340-12	GJMB350-10	MN 35-10	0815	GMN 35	GTS35		Kc 35-10		

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	Material Description			Composition / Structure / Heat Treatment					HB	HRc
				BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST		
<p>K VDI 3323 20 Malleable cast iron Pearlitic HB 230 HRc 21</p>													
0.8145	FCMW370	GTS-45	A220-40010	P 440-7	GJMB450-6	MN 450	0852	GMN 45					
0.8155	FCMP490	GTS-55	50005	P 510-4	GJMB-550-4	MP 50-5	0854	GMN 55			Kc 60-3		
0.8165	FCMP590	GTS-65	70003	P 570-3	GJMB-650-2	MN 650-3	0856	GMN 65					
0.8170	FCMP690	GTS-70	90001	P 690-2	GJMB-700-2	MN 700-2	0862	GMN 70			Kc 70-2		

Material Groups

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Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 21	Material Description Aluminum-wrought alloy	Composition / Structure / Heat Treatment Not Curable	HB 60	HRc
3.0255	(A1050)	Al99.5	1000	L31		A59050C						D1						
3.3315		AlMg1																

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 22	Material Description Aluminum-wrought alloy	Composition / Structure / Heat Treatment Curable, Hardened	HB 100	HRc
3.1655	A2011	AlCuSiPb																
3.2315		AlMgSi1										AK9						
3.4345		AlZnMgCu0.5	7050	L86		AZ4GU/9051		811-04										
3.4365	7075	AlZnMgCu1.5	7075	7075		7075		AlZn5.8MgCuCr				B95						

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 23	Material Description Aluminum-cast, alloyed	Composition / Structure / Heat Treatment ≤ 12% Si, Not Curable	HB 75	HRc
3.2382		GD-AlSi10Mg																
3.2383		G-AlSi0Mg(Cu)	A360.2	LM9			4253											
3.2581		G-AlSi12																
3.3561		G-ALMg5																
3.5101		G-MgZn4sE1Zr1	ZE41	MAG5														
3.5103		MgSE3Zn27r1	EZ33	MAG6		G-TR3Z2												
3.5812		G-MgAl8Zn1	AZ81	NMAG1														
3.5912		G-MgAl9Zn1	AZ91	MAG7														
			A356-72	2789		NFA32-201												
A5052			356.1	LM25			4244					AK7						
		G-AlSi12	A413.2	LM6			4261											
ADC12		G-AlSi12(Cu)	A413.1	LM20			4260					AK12						
A6061		GD-AlSi12	A413.0				4247											
A7075		GD-AlSi8Cu3	A380.1	LM24			4250											

Material Groups

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Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 24	Material Description Aluminum-cast, alloyed	Composition / Structure / Heat Treatment ≤ 12% Si, Curable, Hardened	HB 90	HRc
3.1754		G-AlCu5Ni1.5																
3.2371		G-AlSi7Mg	4218B															AK8
3.2373	C4BS	G-AlSi9MgWA	SC64D			A-57G	4251											AK9
3.2381		G-AlSi10Mg																AK12
3.5106		G-MgAg3SE2Zr1	QE22	mag12														
		G-ALMG5	GD-AlSi12	LM5		A-SU12	4252											

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 26	Material Description Copper and Copper Alloys (Bronze / Brass)	Composition / Structure / Heat Treatment Cutting alloys, PB>1%	HB 110	HRc
2.1090		G-CuSn75pb	C93200			U-E7Z5pb4												
2.1096		G-CuSn5ZnPB	c83600	LG2														
2.1098		G-CuSn2Znpb	C83600															
2.1182		G-CuPb15Sn	C23000	LB1		U-pb15E8												

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 27	Material Description Copper and copper alloys (Bronze / Brass)	Composition / Structure / Heat Treatment CuZn, CuSnZn (Brass)	HB 90	HRc	
																			2.0240
2.0321		CuZn37	C27200	cz108		CuZn36,CuZn37		C2700											L63
2.0590		G-CuZn40Fe																	
2.0592		G-CuZn35Al1	C86500	U-Z36N3		HTB1													
2.0596		G-CuZn34Al2	C86200	HTB1		U-Z36N3												LTs23AD	
2.1293		CuCrZr	C18200	CC102		U-Cr0-8Zr													

Mat'l No.	JIS	DIN	AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	N	VDI 3323 28	Material Description Copper and copper alloys (Bronze / Brass)	Composition / Structure / Heat Treatment CuSn, lead-free copper and electrolytic copper	HB 100	HRc	
																			2.0060
2.0966		CuAl10Ni5Fe4	C63000	Ca104		U-A10N													BrAD
2.0975		G-CuAl10Ni	B-148-52																
2.1050		G-CuSn10	c90700	CT1															
2.1052		G-CuSn12	C90800	pb2		UE12P													
2.1292		G-CuCrF35	C81500	CC1-FF															

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 31 Heat resistant super alloys Fe Based, Annealed HB 200 HRc 15</p>												
1.4558	NCF 800 TB	X2NiCrAlTi3220	N08800	NA15								
1.4562		X1NiCrMoCu32287	N08031									
1.4563		X1NiCrMoCuN31274	N08028			Z1NCDU31-27-03	2584				EK77	
1.4864	SUH330	X12NiCrSi36-16	330	NA17		Z12NCS37-18						N08330
1.4865	SCH15	GX40NiCrSi38-18		330C40				XG50NiCr3919				J94605
1.4958		XSNiCrAlTi3120										

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 32 Heat resistant super alloys Fe Based, Aged HB 280 HRc 30</p>												
1.4977		X40CoCrNi2020				Z42CNKDWNb						

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 33 Heat resistant super alloys Ni or Co Based, Annealed HB 250 HRc 25</p>												
2.4360		NiCu30Fe		NA13		NU30					N04400	Monel400
2.4603		NiCr 30 FeMo	5390A			NC22FeD						Hastelloy G-30
2.4610		NiMo16Cr16Ti									N26455	HastelloyC-4
2.4630		NiCr20Ti		HR5,203-4		NC20T					N06075	Nimonic75
2.4631	NCF 80A	NiCr20TiAl		Hr40		NC20TA					N07080	KHN77TYuR Nimonic 80A
2.4642	NCF 690	NiCr29Fe				Nnc30Fe					N06690	Inconel 690
2.4856		NiCr22Mo9Nb		NA21		NC22FeDNb					N06625	Inconel 625
2.4858		NiCr21Mo		NA16		NC21FeDU					N08825	KHN38VT Incoloy 825

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 34 Heat resistant super alloys Ni or Co Based, Aged HB 350 HRc 38</p>												
2.4375		NiCu30Al	4676	NA18		NU30AT					N05500	Monelk500
2.4662		NiFe35Cr14MoTi	5660			ZSNCDT42					N09901	Incoloy 901
2.4668		NiCr19Fe19NbMo	5383	HR8		NC19eNB					N07718	Inconel 718
2.4670		S-NiCr13A16MoNb	5391	Mar-46		NC12AD						Nimocast 713
2.4694		NiCr16Fe7TiAl									N07751	Inconel 751
2.4955		NiFe25Cr20NbTi										
2.4964		CoCr20W15Ni	5772			KC20WN						Haynes 25
		CoCr22W14Ni	AMS 5772			KC22WN						

Material Groups

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Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 35 Heat resistant super alloys Ni or Co Based, Cast HB 320 HRc 34</p>												
2.4669		NiCr15Fe7TiAl				NC15TNbA					N07750	Inconel X750
2.4685		G-NiMo28									N10665	Hastelloy B
2.4810		G-NiMo30										Hastelloy C
2.4973		NiCr19Co11MoTi	AMS 5399			NC19KDT						VT5-1
3.7115		TiAl5Sn2									R54520	VT1-00 ATI Grade 6

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 36 Titanium alloys Pure Titanium HB 400 Rm</p>												
2.4674		NiCo15Cr10MoAlTi	AMS 5397								N13100	IN 100
3.7025		Ti1	R50250	2TA1							R50250	ATI 30 CP Gr. 1
3.7225		Ti1pd	R52250	TP1							R52250	

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS		
<p>S VDI 3323 37 Titanium alloys Alpha + Beta Alloys, Hardened HB 1050 Rm</p>												
3.7124		TiCu2				2TA21-24						
3.7145		TiAl6Sn2Zr4Mo2Si	R54620								R54620	
3.7165		TiAl6V4	AMS R56400	TA10-13		T-A6V						VT6
3.7185		TiAl4Mo4Sn2		TA45-51								
3.7195		TiAl3V2.5									R56320	ATI 3-2.5
		TiAl4Mo4Sn4Si0.5										
		TiAl5Sn2.5	AMS R54520	TA14/17		T-A5E						
		Ti6Al4VELI	AMS R56401	TA11								

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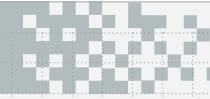


Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc	
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	
		H	VDI 3323	Material Description			Composition / Structure / Heat Treatment					HB	HRc
		38	Hardened steel			Hardened					550	55	
1.1231	S 70 C-CSP	Ck 67	1070	060 A 67	C 67S	XC 68	1770	C 70	F 5103		70		
1.1248	C 75	Ck 75	1078, 1080	060 A 78	C 75S	XC 75	1774	C 75	F 5107		75		
1.1274	SUP 4	Ck 101	1095	060 A 96	C 100S	XC100	1870	C100	F 5117				
1.1545	SK 3	C 105 W1	W1	BW 2	C 105U	Y1 105	1880	C 100 KU	F 5118		U10A		
1.2762		75CrMoNiW67	-	-	-	-	-	-	-				
1.3401	SCMnH1	GX120Mn12	A128(A)			Z120M12	2183	GX120Mn12	F 8251		110G13L		
1.4021	SUS 420 J1	X 20 Cr 13	420	420 S 37	X 20 Cr 13	Z 20 C 13	2303	X 20 Cr 13	F 5261		20KH13	ATI 420	
1.4109	SUS 440 A	X 65 CrMo 14	440 A	-	X 70 CrMo 15	Z 70 D 14	-	-	-			ATI 440A	
1.4112	SUS 440 B	X 90 CrMoV 18	440 B	409 S 19	X 90 CrMoV 18	Z 2 CND 18 05	2327	X CrTi 12					
1.4125	SUS 440 C	X 105 CrMo 17	440 C	-	X 105 CrMo 17	Z 100 CD 17	-	X 105 CrMo 17			95KH18	ATI 440C	
1.6746		32NiCrMo14-5	-	832M31	32NiCrMo14-5	35NCD14	-	-					
1.7176	SUP9(A)	55Cr3	5155	527A60	48	55C3	2253	55Cr3					
1.7225	SCM 440 (H)	42CrMo4	4140	708 M 40	42 CrMo 4	42 CD 4	2244	42 CrMo 4	F 1252		38HM		

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc	
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	
		H	VDI 3323	Material Description			Composition / Structure / Heat Treatment					HB	HRc
		40	Chilled cast iron			Cast					400	42	
0.9620		GX260NiCr42	A532 IB	Grade 2 A	GJN-HV520	FB Ni4 Cr2 BC	0512	-		F45001		Ni-Hard2	
0.9625		GX330NiCr42	A532 IA	Grade 2 B	GJN-HV550	FB Ni4 Cr2 HC	0513	-		F45000		Ni-Hard1	
0.9630		GX300CrNiSi 9 5 2	A532 ID	Grade 2 C	GJN-HV600	FB Cr9 Ni5	0457	-		F45003		Ni-Hard 4	
0.9640		GX300CrMoNi1521	-	-	-	-	-	-		F45005			
0.9650		GX260Cr27	-	Grade 3 D	-	-	0466	-					
0.9655		GX300CrNiMo271	-	Grade 3 E	-	-	-	-			20C 25N20S2		
1.4841	SUH 310	X15CrNiSi25-20	310	314S31	X 15 CrNiSi 25 20	Z15CNS25-20	-	-		S31400		Cronifer 2520	

Mat'l No.	JIS	DIN	Material Description			Composition / Structure / Heat Treatment					HB	HRc	
			AISI/ASTM/SAE	BS	EN	AFNOR	SS	UNI	UNE / IHA	UNS	GOST	Brands	
		H	VDI 3323	Material Description			Composition / Structure / Heat Treatment					HB	HRc
		41	Hardened cast iron			Hardened					550	55	
0.9635		GX300 CrMo 15 3	-	-	-	-	-	-					
0.9645		GX260 CrMoNi 20 21	-	-	-	-	-	-		F45007			

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