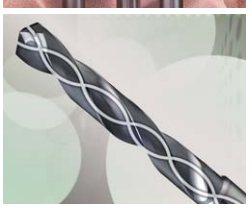
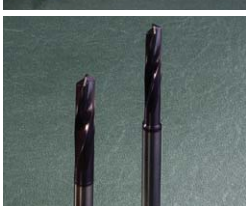
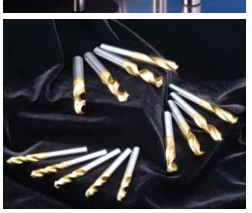
YG

CUTTING TOOLS

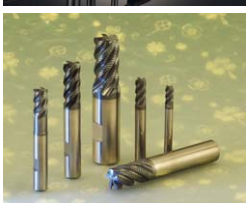
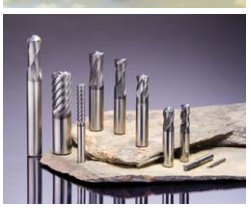
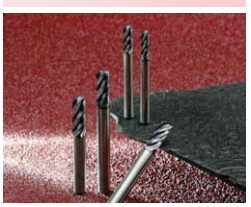
DRILLING

	PRODUCTS	DESCRIPTION	PAGE
	**i-DREAM DRILLS, CARBIDE INSERT**	- For Steels and Stainless Steel Alloys	29
	**SOLID CARBIDE DREAM DRILLS (with & without Coolant Holes)**	- With & without Coolant Holes General Purpose HRc30 to HRc50	43
	**SOLID CARBIDE DREAM DRILLS - INOX (with Coolant Holes)**	- with Coolant Holes Stainless Steels, Nickel Alloys and Titanium up to HRc35.	61
	**SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)**	- with Coolant Holes for Aluminum & Aluminum Alloys	73
	**SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)**	- with Coolant Holes Minimum Quantity Lubrication. Drilling Deep Holes, 10D, 15D & 20D	81
	**SOLID CARBIDE DREAM DRILLS - For HIGH HARDENED STEELS**	- High Hardened Steels, HRc50~HRc70	87
	**STANDARD CARBIDE DRILLS**	- General Purpose 118° Point	95
	**HSS-PM MULTI-1 DRILLS**	- HSS-PM MULTI-1 DRILLS Multi Purpose Drilling. Particularly for Stainless Steels	103
	**HPD DRILLS**	- HSS-EX HPD STRAIGHT SHANK DRILLS for Stainless Steels	111

DRILLING

THREADING

MILLING

	PRODUCTS	DESCRIPTION	PAGE
	**CBN END MILLS**	- Cubic Boron Nitride, Machining High Hardened Steels up to HRc70, Mirror Finish	375
	**i-Xmills, CARBIDE INSERT END MILLS**	- Available for General Steels(~HRc50), Hardened Steels(up to HRc65) and Graphite	381
	**X5070 NANO SOLID CARBIDE END MILLS**	- High Hardened Steels HRc45 to HRc70, High Speed Machining, Dry Cutting	397
	**4G MILL SOLID CARBIDE END MILLS**	- High Speed Cutting for Pre-Hardened Steels up to HRc55	431
	**X-SPEED ROUGHER SOLID CARBIDE END MILLS**	- Carbide Roughing End Mills for High-Feed Machining with reduced vibrations	441
	**X-POWER SOLID CARBIDE END MILLS**	- Medium Steels to High Hardened Steels up to HRc70	529
	**JET-POWER SOLID CARBIDE & HSS-PM END MILLS**	- Exotic materials like Stainless Steels, Nickel alloys and Titanium	551
	**V7 Mill STEEL SOLID CARBIDE END MILLS**	- Steels in Heavy and Silent Cutting Materials up to HRc40. Designed as Unequal Leads.	563
	**V7 Mill INOX SOLID CARBIDE END MILLS**	- Stainless Steels in Heavy and Silent Cutting Materials up to HRc40. Designed as Variable Leads, YG-1'sPatent	581

MILLING

OTHER TOOLS

i-DREAM DRILL - GENERAL

TOOL

HOLDER	ZB0302
INSERT	Y03B07

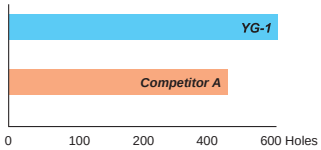
WORKPIECE - Structural Steels

ASTM	A36
DIN	St37-2
JIS	SS400

CONDITIONS

Cutting Speed	262 ft/min.
Feed	.0094 inch/rev.
Feedrate	16.59 inch/min.
RPM	1756 rev./min.
Drilling	1.89″
Coolant	Internal
Machine type	Vertical Machining Center

RESULT



YG-1 (Total Drilling 600 Holes)

Competitor A (Total Drilling 470 Holes)

i-DREAM DRILL - INOX

TOOL

HOLDER	ZB0301
INSERT	YI3B01

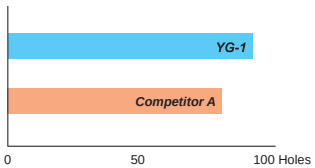
WORKPIECE - Stainless Steels

AISI	304
DIN	X5CrNi189
JIS	SUS304

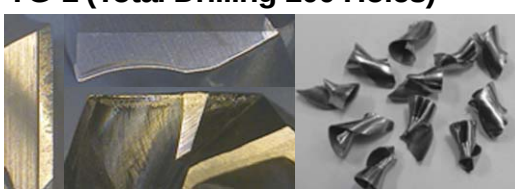
CONDITIONS

Cutting Speed	180 ft/min.
Feed	.0059 inch/rev.
Feedrate	7.402 inch/min.
RPM	1250 rev./min.
Drilling	1.97″
Coolant	Internal
Machine type	Vertical Machining Center

RESULT

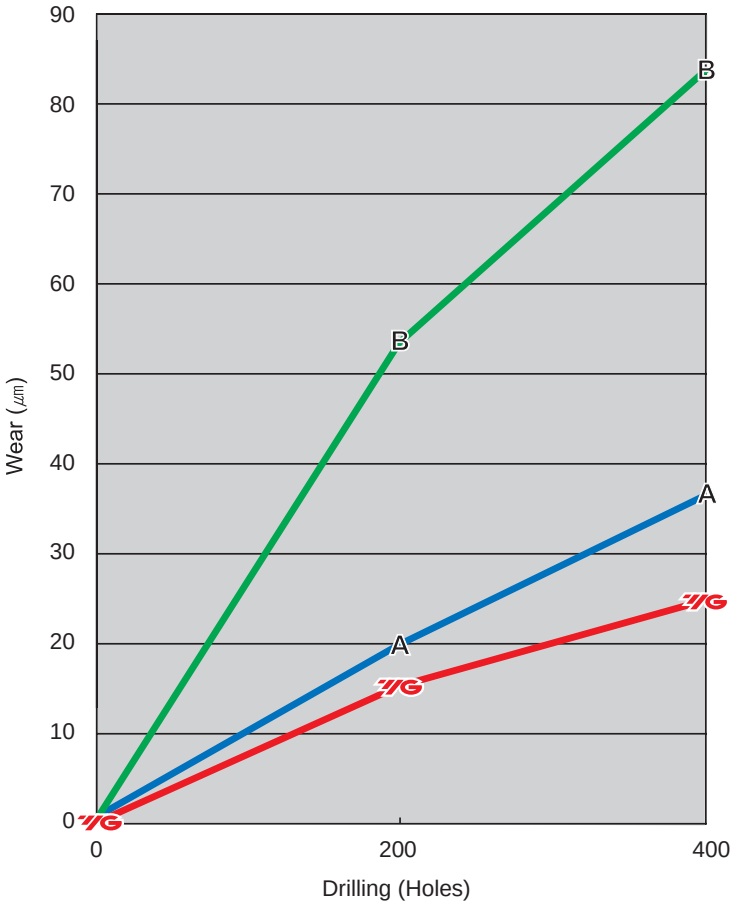


YG-1 (Total Drilling 100 Holes)



Competitor A (Total Drilling 80 Holes)

CASE STUDY ◆ DREAM DRILLS INOX (Reference page : p.61 ~ p.72)

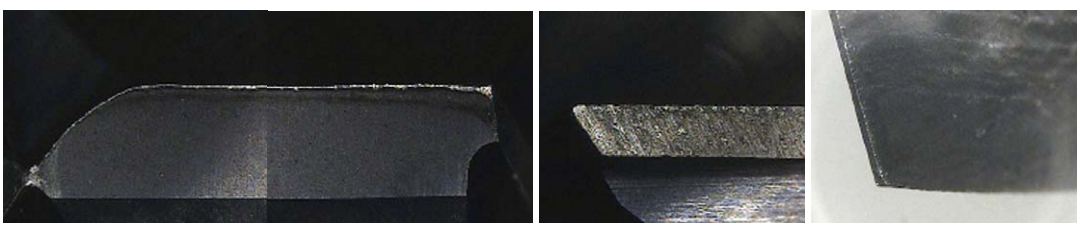


CUTTING CONDITION

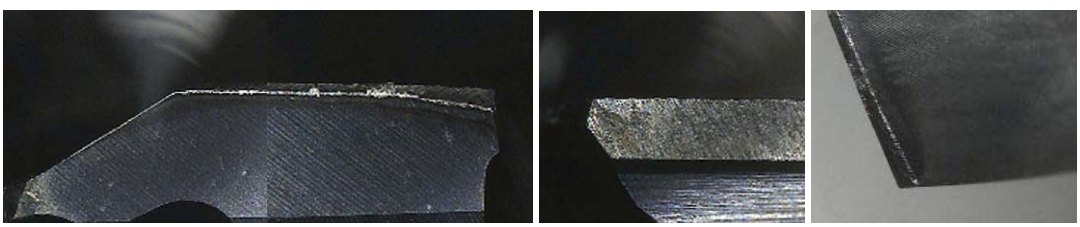
Tools : DREAM DRILLS-INOX
Size : ∅6 x ∅6 x 44 x 82
Work Material :
- JIS:SUS304
- DIN:X5CrNi1810 (X4CrNi18-10)
- WR:1.4301

R.P.M : 3700 rev./min.
SFM : 229 ft/min.
Feed : .0028 inch/rev.
Drilling Depth : .94″
Coolant : Wet Cut

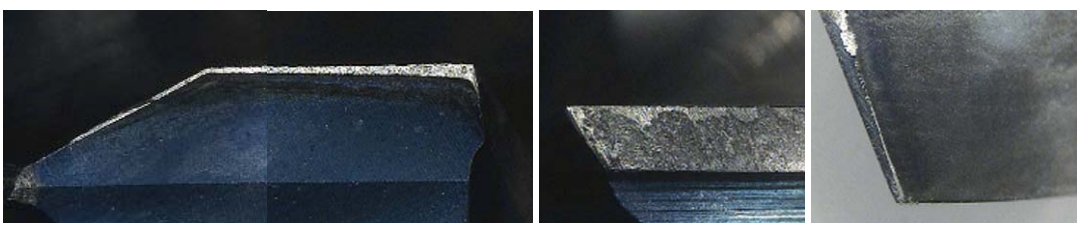
YG-1 (Total Drilling 400 Holes)



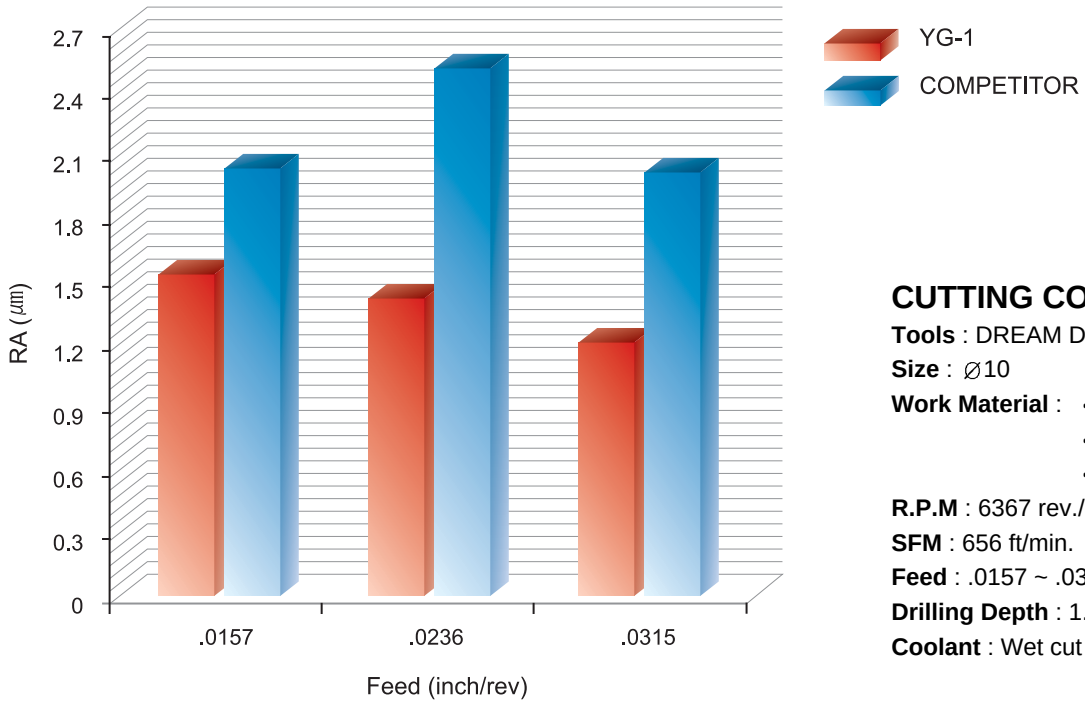
Competitor A (Total Drilling 400 Holes)



Competitor B (Total Drilling 400 Holes)



Surface Roughness of Work Piece



CUTTING CONDITION

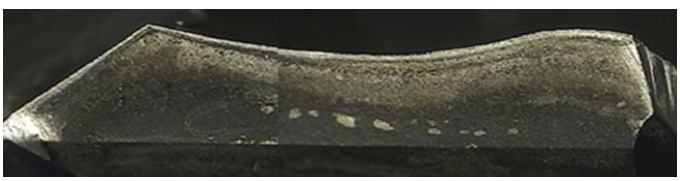
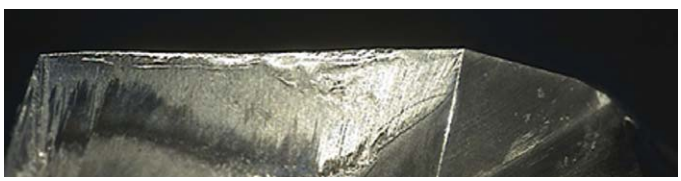
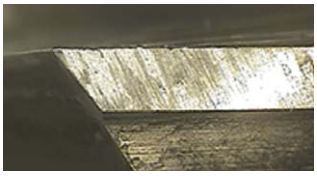
Tools : DREAM DRILL ALU
Size : ∅10
Work Material :
- Al(6061)
- JIS:A6061
- DIN:AlMgSiCu

R.P.M : 6367 rev./min.
SFM : 656 ft/min.
Feed : .0157 ~ .0315 inch/rev.
Drilling Depth : 1.77″
Coolant : Wet cut

YG-1 (Total Drilling 820 Holes)



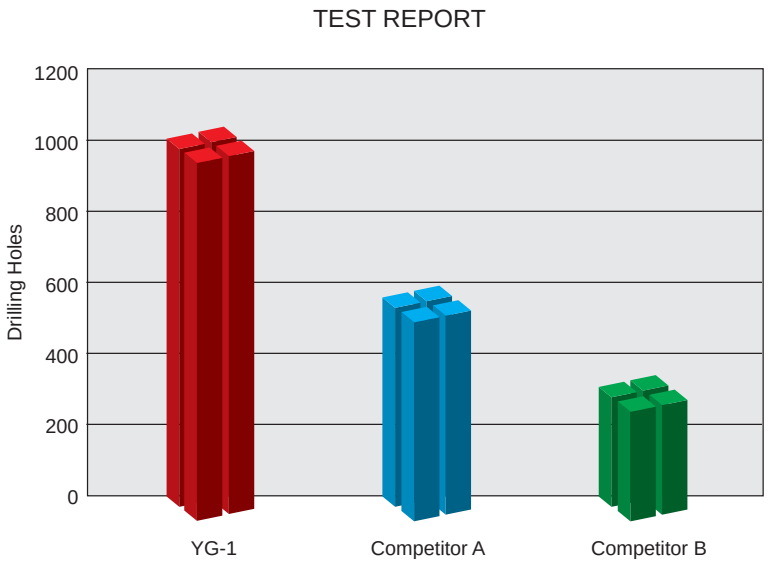
COMPETITOR (Total Drilling 820 Holes)

FEATURES OF DREAM DRILLS MQL TYPE

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

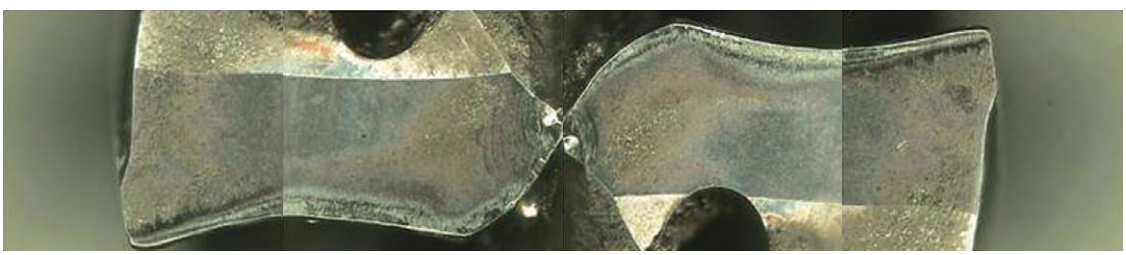
TEST RESULT AGAINST COMPETITOR's DRILLS



CUTTING CONDITION

- **Tools** : Carbide MQL Drill (20 × D)
- **Size** : ∅6 × ∅6 × 138 × 193
- **Work Material** :
  - JIS:S45C(HRc25)
  - DIN:C45
  - WR:1.0503
- **R.P.M** : 3528 rev./min.
- **SFM** : 218 ft/min.
- **Feed** : .0075 inch/rev.
- **Drilling Depth** : 3.15″
- **Coolant** : Oil Mist (MQL Techniques)

YG-1 (After Drilling 1,000 Holes)

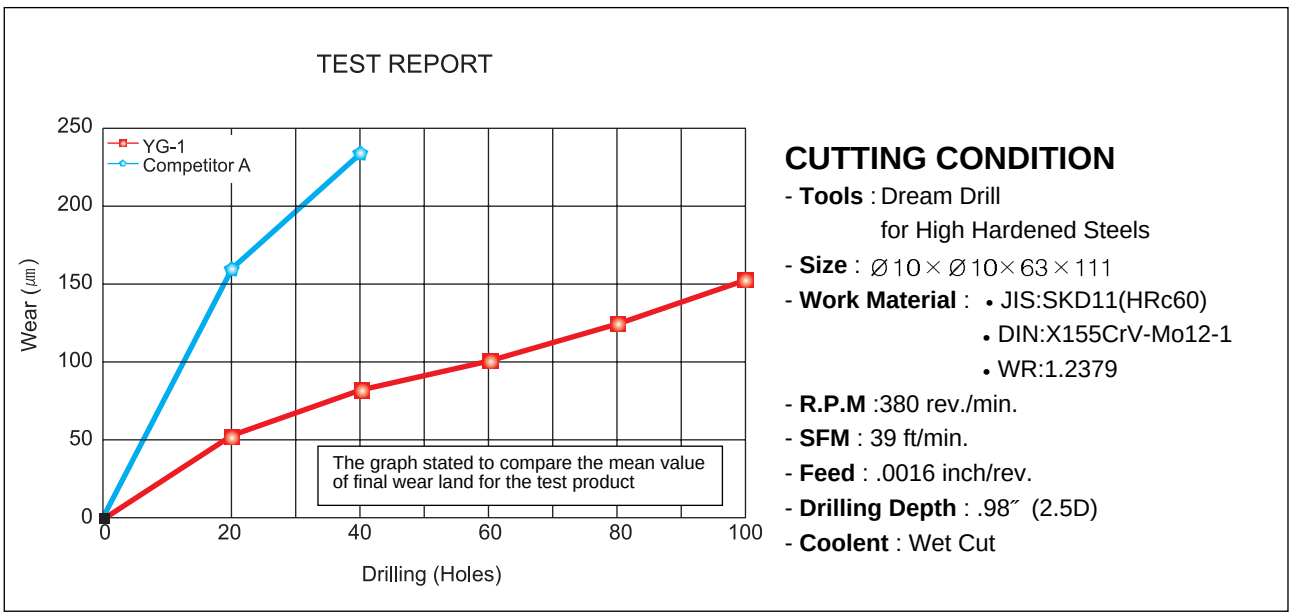


Competitor A (After Drilling 546 Holes)

FEATURES OF DREAM DRILLS HARDENED STEELS

- 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.

TEST RESULT AGAINST COMPETITOR's DRILLS

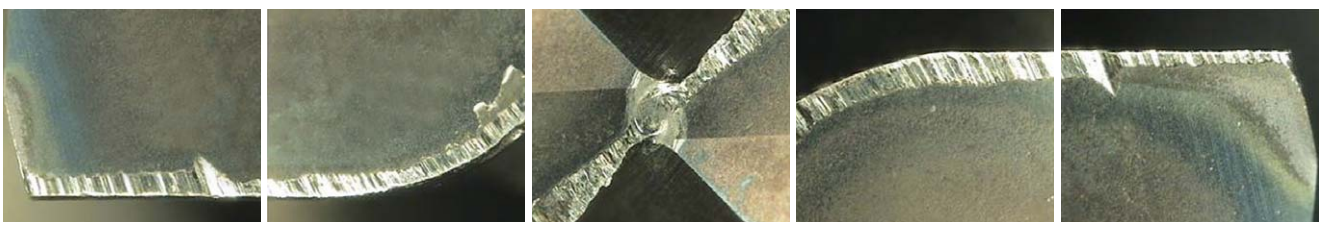


CUTTING CONDITION

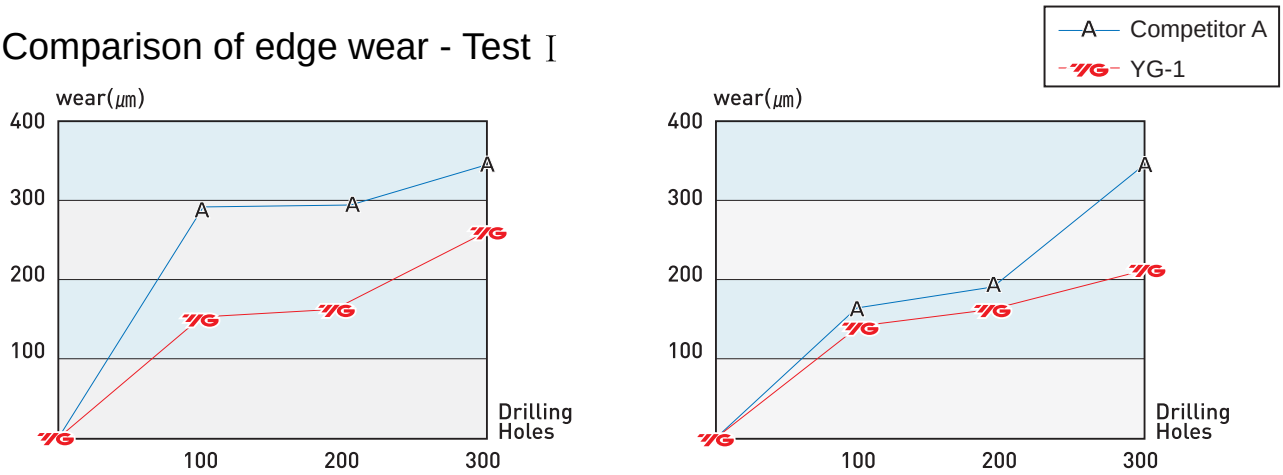
- **Tools** : Dream Drill for High Hardened Steels
- **Size** : Ø10 × Ø10 × 63 × 111
- **Work Material** :
  - JIS:SKD11(HRc60)
  - DIN:X155CrV-Mo12-1
  - WR:1.2379
- **R.P.M** :380 rev./min.
- **SFM** : 39 ft/min.
- **Feed** : .0016 inch/rev.
- **Drilling Depth** : .98″ (2.5D)
- **Coolent** : Wet Cut

YG-1 (After Drilling 100 Holes)

Competitor A (After Drilling 40 Holes)



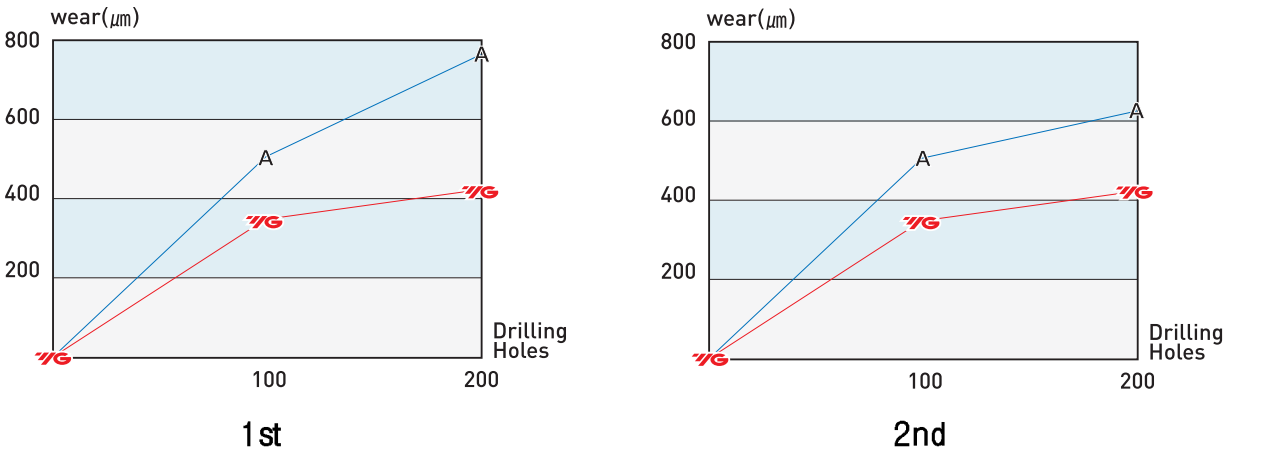
Comparison of edge wear - Test Ⅰ



CUTTING CONDITION

- **Work material** : • JIS:SUS316
  • DIN:X3CrNiMo17-13-3
  • WR:1.4436
- **Drilling Depth** : .94″
- **Total Drilling(hole)** : 300 Holes
- **R.P.M** : 600 rev./min.
- **Feed** : 4.3307 inch/min.

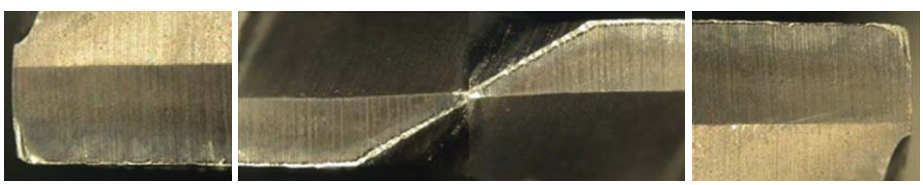
Comparison of edge wear - Test Ⅱ



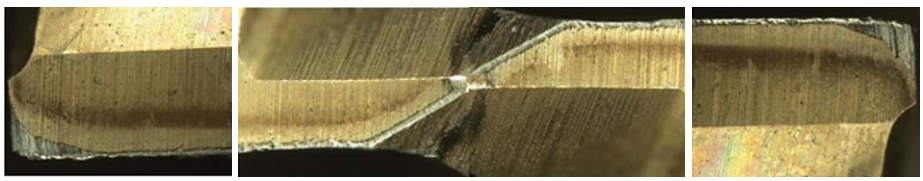
CUTTING CONDITION

- **Work material** : • JIS:SKD11
  • DIN:X155CrVMo12-1
  • WR:1.4436
- **Drilling Depth** : .94″
- **Total Drilling(hole)** : 200 Holes
- **R.P.M** : 600 rev./min.
- **Feed** : 4.3307 inch/min.

YG-1



Competitor A



COMBO - SPIRAL FLUTE

Cutting Condition

- **Tools** : Combo Spiral Flute Tap
- **Size** : M8 × 1.25
- Work Material :
  - JIS:S45C(HRc35)
  - DIN:C45
  - WR:1.0503
- Tapping Depth : .79″
- Coolant : Water Soluble Oil
- SFM (Tapping Speed) : 33 ft/min.

YG-1(Total Tapping 204 Holes)

Surface Roughness of Work Piece

204 Holes ▶

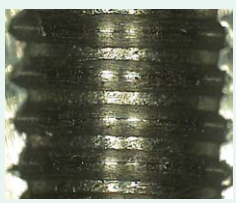
Competitor A (Total Tapping 159 Holes)

Surface Roughness of Work Piece

159 Holes ▶

Competitor B (Total Tapping 204 Holes)

Surface Roughness of Work Piece



204 Holes ▶

COMBO - SPIRAL POINT

Cutting Condition

- **Tools** : Combo Spiral Point Tap
- **Size** : M2 × 0.4
- Work Material :
  - JIS:S45C(HRc35)
  - DIN:C45
  - WR:1.0503
- Tapping Depth : .24″
- Coolant : Tapping Oil
- SFM (Tapping Speed) : 33 ft/min.

YG-1(Total Tapping 450 Holes)

Competitor A (Total Tapping 318 Holes)

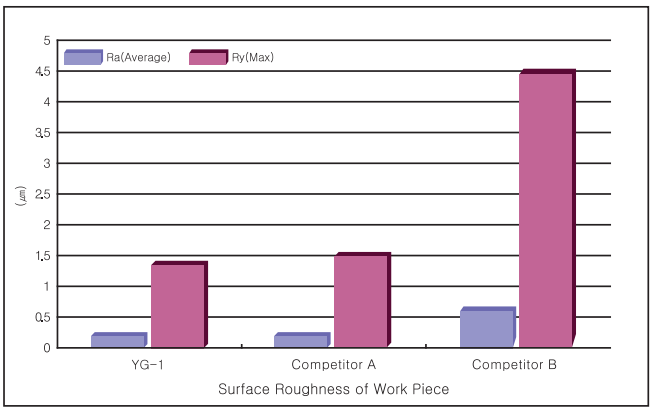
Tool was broken after 318 holes tapping

Competitor B (Total Tapping 103 Holes)

Tool was broken after 103 holes tapping

TEST Ⅰ (Total Milling Length : 787 ft)

▶ Surface Roughness of Work Piece



CUTTING CONDITION (∅1mm)

Tools : 2Flute, CBN Ball Nose End mill
Size : ∅1 × ∅4 × 0.6 × 50
Work Material : • JIS:SKD11(HRc60)
• DIN:X155CrV-Mo12-1
• WR:1.2379
Cutting Speed :**309** ft/min.
R.P.M : 30000 rev./min.
Feed : 59.06 inch/min.
Milling Depth : .0004˝
Coolant : Oil Mist
Machine : Machining Center

▶ Maximum Wear (㎛)

YG-1 (19.611㎛)

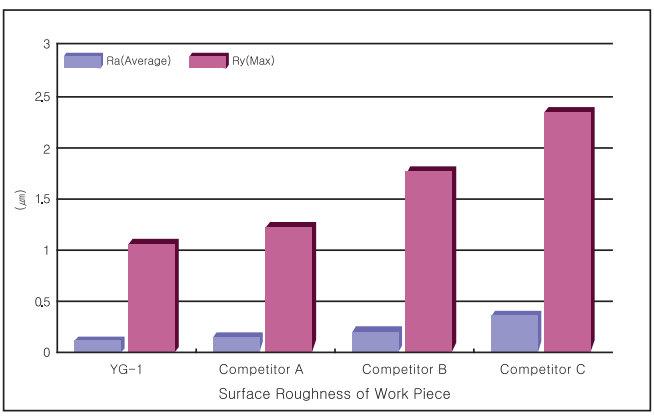
Competitor A (32.249㎛)

Competitor B

Tool was broken after 100 meter milling

TEST Ⅱ (Total Milling Length : 2.460 ft)

▶ Surface Roughness of Work Piece

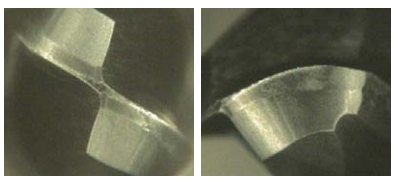


CUTTING CONDITION (∅2mm)

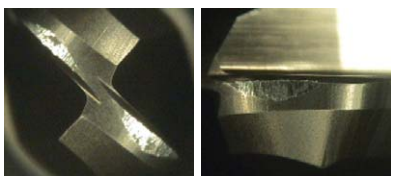
Tools : 2Flute, CBN Ball Nose End mill
Size : ∅2 × ∅4 × 1.8 × 50
Work Material : • JIS:SKD11(HRc60)
• DIN:X155CrV-Mo12-1
• WR:1.2379
Cutting Speed : 618 ft/min.
R.P.M : 30000 rev./min.
Feed : 78.74 inch/min.
Milling Depth : .0004˝
Coolant : Oil Mist
Machine : Machining Center

▶ Maximum Wear (㎛)

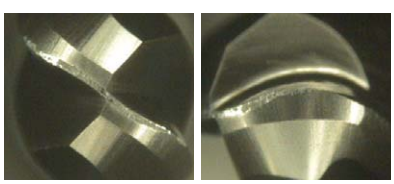
YG-1 (57.630㎛)



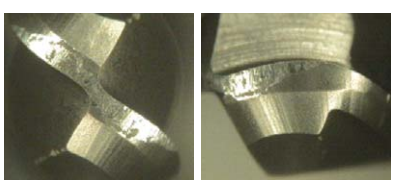
Competitor A (100.314㎛)



Competitor B (71.471㎛)

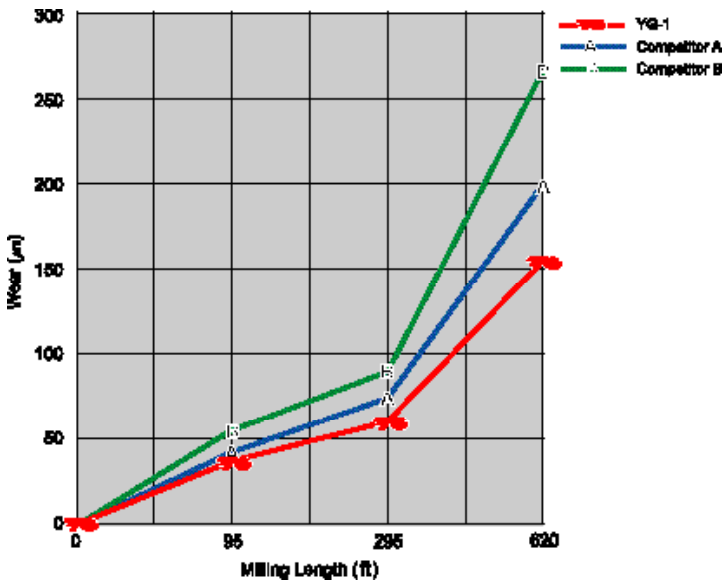


Competitor C (170.200㎛)

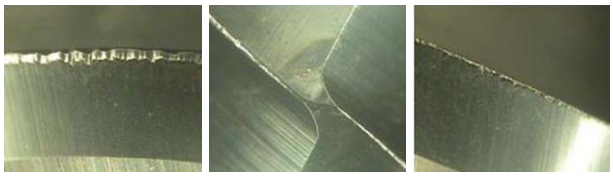


CASE STUDY ◆ i-Xmill (Reference page : p.381 ~ p.396)

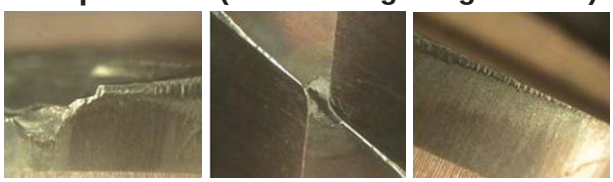
i-Xmill - BALL



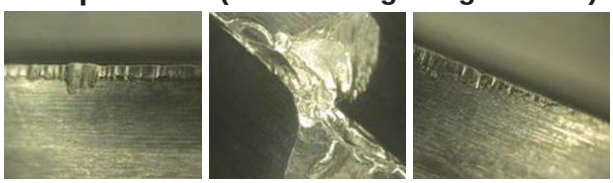
YG-1 *i*-Xmill (Total Milling Length 620 ft)



Competitor A (Total Milling Length 620 ft)



Competitor B (Total Milling Length 620 ft)



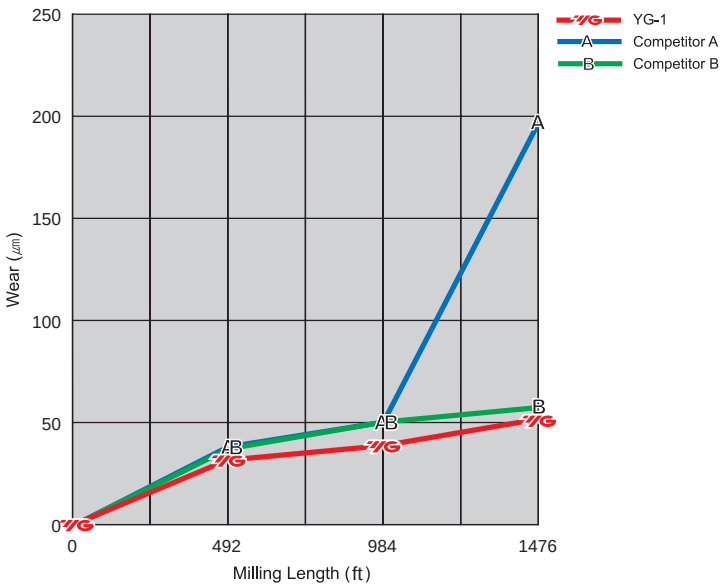
CUTTING CONDITION

Tools : i -Xmill Ball
Size : ∅16 × R8.0
Work Material : JIS : SKD61 (HRc50),
DIN : X40GrMoV51(1.2344)
AISI : H13

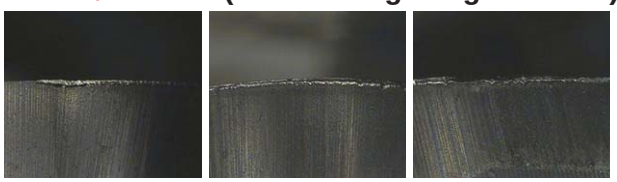
Cutting Speed : 264 ft/min.
R.P.M : 1,600 rev./min.
Feed : 15.35 inch/min.
Feed per tooth : .0047 inch/tooth
Milling Method : Side Cutting

Milling Depth : Axial : .0315″
Radial : .0630″
Coolant : Oil Mist
Overhang : YG-1, Competitor B : 1.89″
Competitor A : 2.20″
Machine : Machining Center

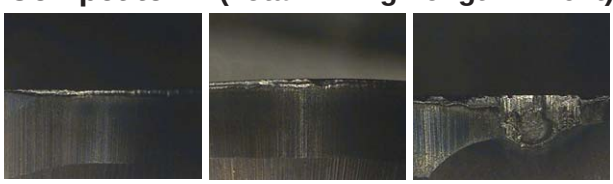
i-Xmill - CORNER RADIUS



YG-1 *i*-Xmill (Total Milling Length 1476 ft)



Competitor A (Total Milling Length 1476 ft)



Competitor B (Total Milling Length 1476 ft)

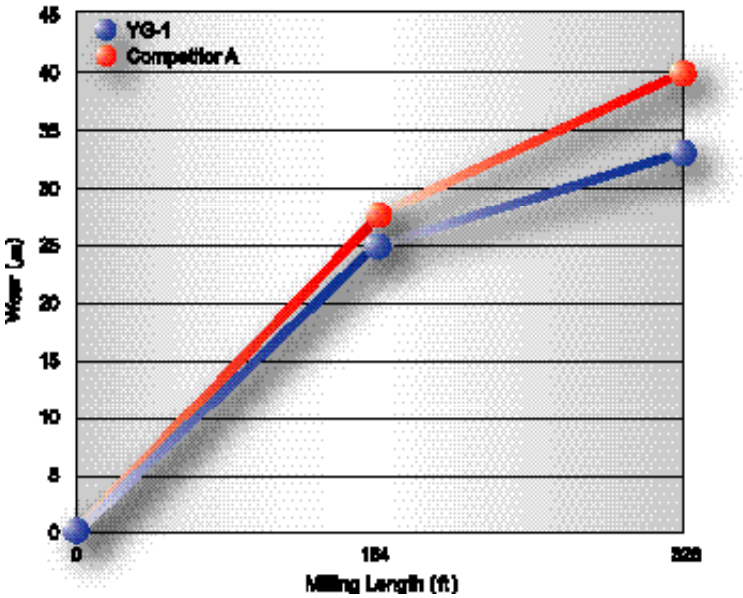
CUTTING CONDITION

Tools : i-Xmill Corner Radius
Size : ∅16 x R2.0
Work Material : KS : KP4M (Mold steels HRc35)
DIN : 40CrMnNiMo8-6-4(1.2738)
AISI : P20+Ni

Cutting Speed : 918 ft/min.
R.P.M : 5,570 rev./min.
Feed : 87.80 inch/min.
Feed per tooth : .0079 inch/tooth
Milling Method : Side Cutting

Milling Depth : Axial : .1181″
Radial : .0079″
Coolant : Oil Mist
Overhang : 2.76″
Machine : Machining Center

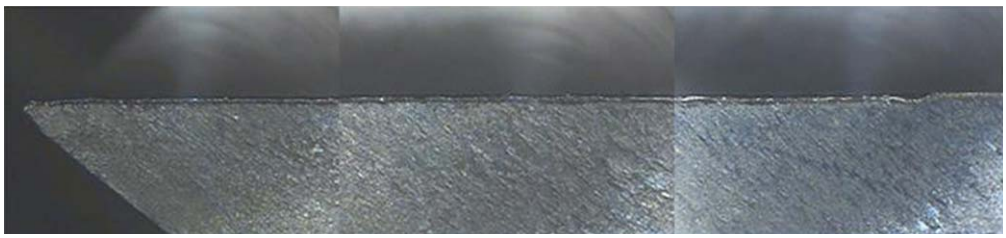
Carbide 6 Flute 45° Helix End Mill for Hardened Steel



CUTTING CONDITION

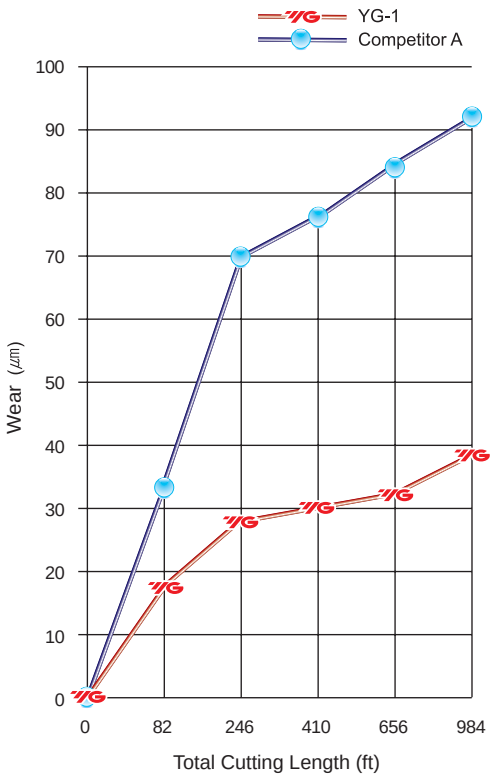
Tools : 6Flute, X5070 45° Helix
Size : ∅16 × ∅16 × 40 × 110
Work Material : • JIS:SKD61(HRc50)
• DIN:X40CrMoV5-1(1.2344)
• AISI:H13
Cutting Speed : 317 ft/min.
R.P.M : 1,920 rev./min.
Feed : 35.91
Milling Method : Down & Side Cutting
Milling Depth : Axial : .9449
Radial : .0378
Coolant : Dry Cut
Overhang : 2.05
Machine : Machining Center

YG-1
(Total Milling Length 328 ft)

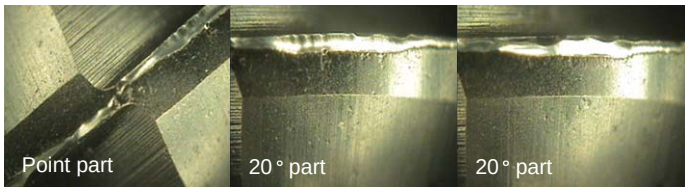


Competitor A
(Total Milling Length 328 ft)

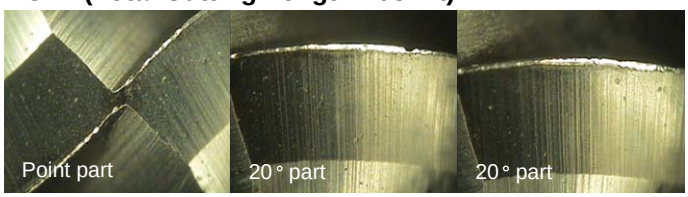
TEST REPORT (Ball)



COMPETITOR A (Total Cutting Length : 984 ft)



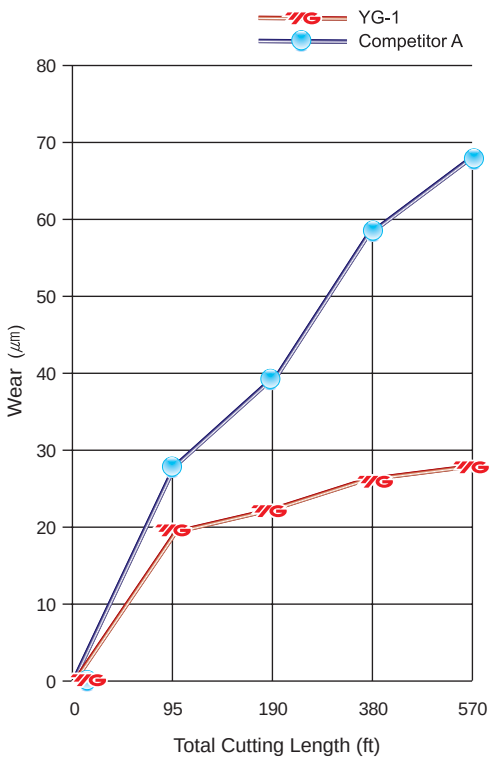
YG-1 (Total Cutting Length : 984 ft)



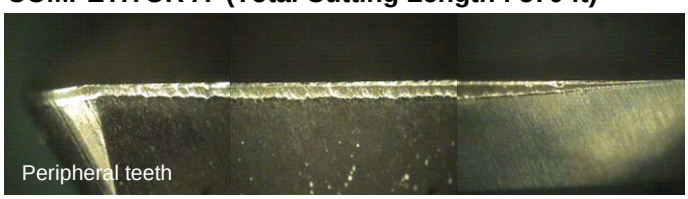
CUTTING CONDITION

Tool : 2Flute, Carbide Ball End Mill
SIZE : ∅6×6×12×90
Work Material : KP4M (HRc35 / DIN 1.2738 Improved)
Cutting Speed : 426.7 ft/min.
R.P.M : 6900 rev./min.
FEED : 32.68 inch/min.
Feed per tooth : .0024 inch/tooth
Milling Method : Profiling
Milling Depth : Axial : .0079″
Radial : .0472″
Coolant : Oil Mist
Overhang : 1.024″

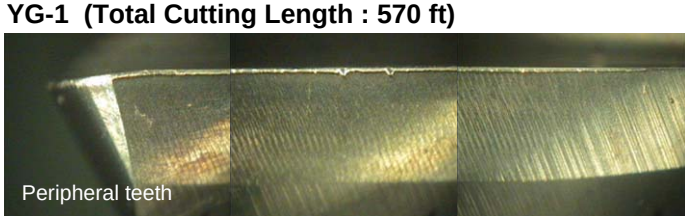
TEST REPORT (Corner Radius)



COMPETITOR A (Total Cutting Length : 570 ft)



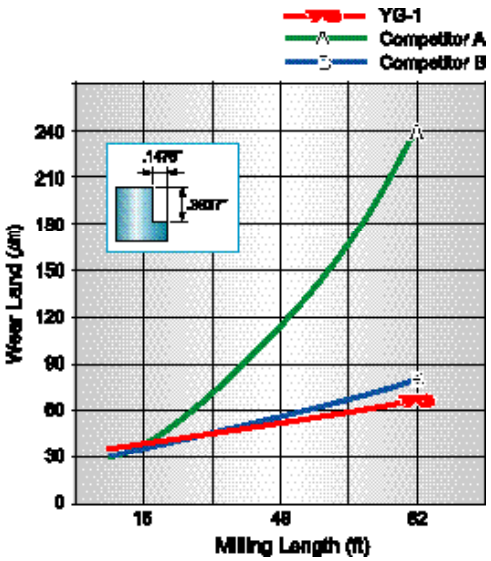
YG-1 (Total Cutting Length : 570 ft)



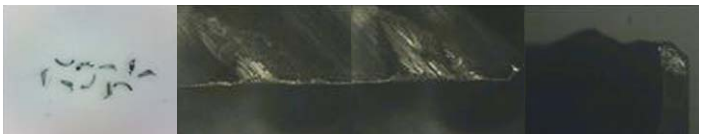
CUTTING CONDITION

Tool : 4Flute, Carbide Corner Radius End Mill
SIZE : ∅10(R0.5)×10×25×100
Work Material : KP4M (HRc35 / DIN 1.2738 Improved)
Cutting Speed : 169 ft/min.
R.P.M : 1640 rev./min.
FEED : 7.09 inch/min.
Feed per tooth : .0011 inch/tooth
Milling Method : Down & Side Cutting
Milling Depth : Axial : .9842″
Radial : .0197″
Coolant : Oil Mist
Overhang : 1.614″

TEST REPORT (DOWN & SIDE CUTTING)

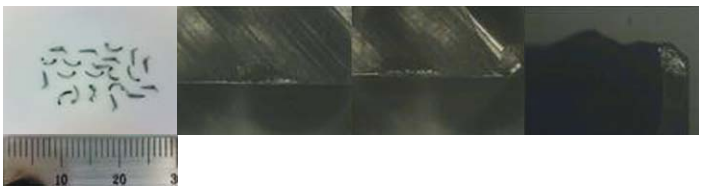


COMPETITOR A



COMPETITOR B

X-SPEED ROUGHER

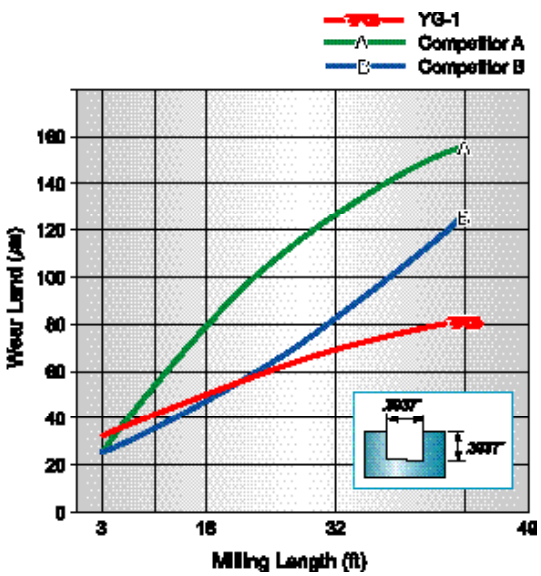


CUTTING CONDITION

SIZE : X-SPEED ROUGHER : Ø10 ×10 ×15 ×72
COMPETITOR A : Ø10 ×10 ×20 ×72
COMPETITOR B : Ø10 ×10 ×15 ×80
Work Material : DIN : X40CrMoV51(1.2344)
JIS : SKD61 (HRc30)
AISI : H13

R.P.M : 5,000 rev./min. (515 ft/min.)
FEED : 51.18 inch/min.
Milling Method : Down & Side Cutting
Coolant : Wet Cut
Overhang : 1.26
Machine : Machining Center

TEST REPORT (SLOTTING)



COMPETITOR A

COMPETITOR B

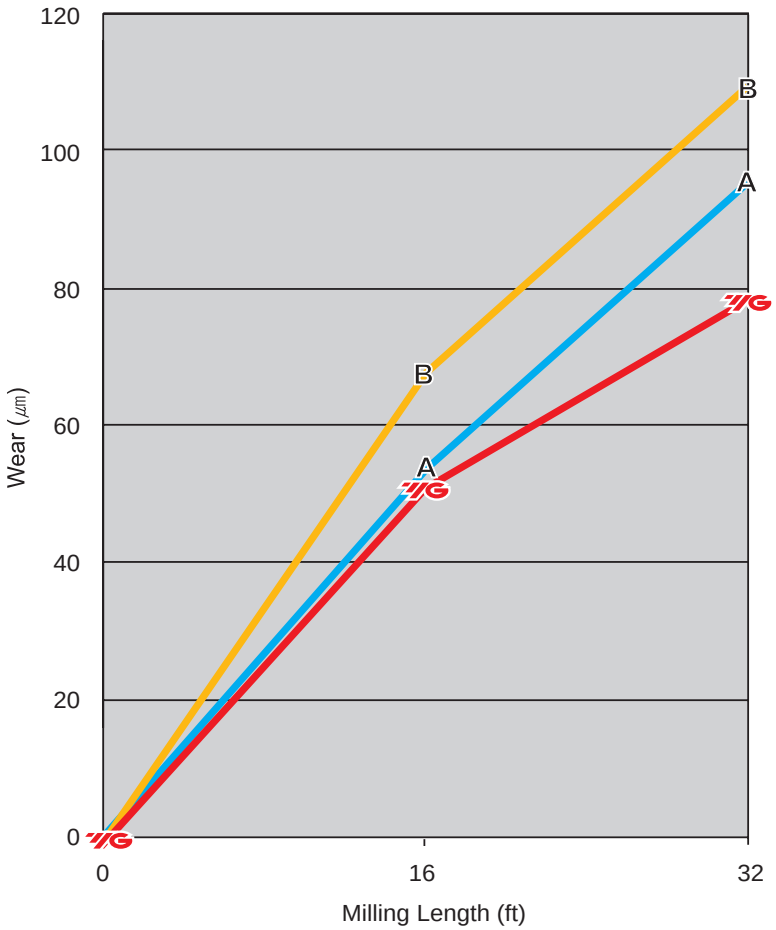
X-SPEED ROUGHER

CUTTING CONDITION

SIZE : X-SPEED ROUGHER : Ø10 ×10 ×15 ×72
COMPETITOR A : Ø10 ×10 ×20 ×72
COMPETITOR B : Ø10 ×10 ×15 ×80
Work Material : DIN : X40CrMoV51(1.2344)
JIS : SKD61 (HRc20)
AISI : H13

R.P.M : 4,000rev./min. (412 ft/min.)
FEED : 39.37 inch/min.
Milling Method : Slotting
Coolant : Wet Cut
Overhang : 1.26
Machine : Machining Center

CASE STUDY ◆ V7 STEELS END MILLS (Reference page : p.551 ~ p.562)



CUTTING CONDITION

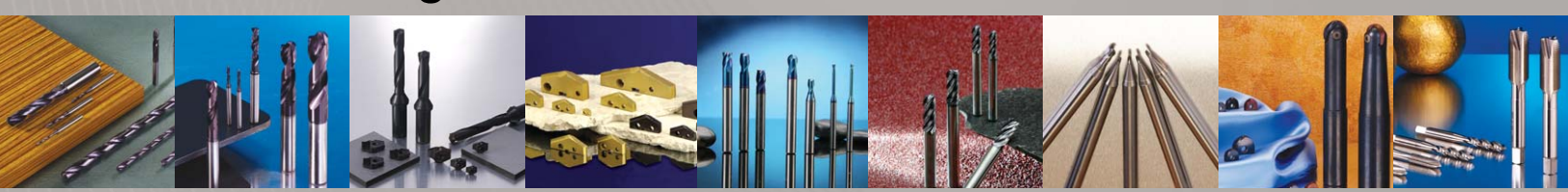
Tools: V7 STEELS, 4Flute
Size : ∅12 × ∅12 × 26 × 83
Work Material : • JIS : SKD61 (HRc30)
• DIN : X40GrMoV51(1.2344)
• AISI : H13
Cutting Speed : 456 ft/min.
R.P.M : 3,688 rev./min.
Feed : 27.153 inch/min.
Milling Method : Down & Side Cutting
Milling Depth : Axial : .71
Radial : .23
Coolant : Wet Cut
Overhang : 1.57
Machine : Machining Center

YG-1
(Total Milling Length 32 ft)

Competitor A
(Total Milling Length 32 ft)

Competitor B
(Total Milling Length 32 ft)

Global Cutting Tool Leader YG-1



DRILLING TOOLS

YG-1 CO., LTD.

Contents

DRILLING TOOLS

YG-1 CO., LTD.

Contents / DRILLING TOOLS

DRILLING TOOLS APPLICATION TABLE

	ITEM	MODEL	DESCRIPTION	SIZE MIN	SIZE MAX	PAGE
i-Dream Drills	Y03 *		Insert for General Purpose	.4724 (#A)	1.2500 (#J)	32~37
	YI3 *		Insert for Stainless Steels	.4724 (#A)	1.2500 (#J)	32~37
Spade Drills	S01~S04		HSS M4 Insert	.7031 (#1)	4.5000 (#8)	198~201
	S06~S09 (SM08)		Super Cobalt T15 Insert	.3740 (#Y)	4.5000 (#8)	202~208 218~221
	S11~S14		Primium HSS M48 Insert	.3740 (#Y)	1.3780 (#2)	209~211
	S21~S23		Carbide C2 Insert (K20)	.3740 (#Y)	1.8750 (#3)	212~216
	S26~S28 (SM28)		Carbide C5 Insert (P40)	.3740 (#Y)	1.8750 (#3)	212~216 222~223
	S16~S18		Carbide C3 Insert (K10)	.3740 (#Y)	1.3780 (#2)	212~215
	SF05 SF15		Super Cobalt T15 Flat Bottom	.3750 (#Y)	1.3750 (#2)	224

	ITEM	MODEL	INCH / METRIC	LENGTH	SIZE MIN	SIZE MAX	PAGE
DREAM DRILLS	DH414		Inch	Short(3XD)	D1/8	D5/8	46
	DH416		Inch	Short(3XD)	D1/8	D5/8	47
	DH418		Inch	Long(5XD)	D13/64	D1/2	48
	DH404		Metric	Stub(3XD)	D3.0	D20.0	49
	DH406		Metric	Short(3XD)	D3.0	D20.0	51
	DH424		Metric	Long(5XD)	D1.0	D2.9	53
	DH408		Metric	Long(5XD)	D1.0	D20.0	54
	DH421		Metric	Extra Long(8XD)	D3.0	D14.0	57

INSERT

◎ : Excellent
○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloy
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
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SOLID

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
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DRILLING TOOLS APPLICATION TABLE

	ITEM	MODEL	INCH / METRIC	LENGTH	SIZE		PAGE
					MIN	MAX	
DREAM DRILLS-INOX	DH463		Inch	Short(3XD)	D1/8	D5/8	64
	DH464		Inch	Long(5XD)	D13/64	D1/2	65
	DH451		Metric	Short(3XD)	D3.0	D20.0	66
	DH452		Metric	Long(5XD)	D3.0	D20.0	68
	DH453		Metric	Extra Long(8XD)	D3.0	D14.0	70
DREAM DRILLS-ALU	DGE466		Inch	Long(5XD)	D13/64	D1/2	76
	DGE433		Metric	Long(5XD)	D3.0	D20.0	77
DREAM DRILLS-MQL TYPE	DH510		Metric	Extra Long(10XD)	D3.0	D14.0	84
	DH515		Metric	Extra Long(15XD)	D3.0	D12.0	85
	DH520		Metric	Extra Long(20XD)	D3.0	D12.0	85
DREAM DRILLS - For HIGH HARDENED STEELS	DH501		Inch		D1/8	D3/4	90
	DH500		Metric		D1.0	D14.0	92
STANDARD CARBIDE DRILLS	D5412		Inch	Jobber	#56	#1	98
	D5413		Inch	Jobber	A	Z	99
	D5417		Inch	Jobber	D3/64	D1/2	100
MULTI-1 DRILLS	CDRA05		Inch		D3/32	D1/2	106
	CDRA06		Inch		#45	#1	107
	CDRA07		Inch		B	Z	108
HPD DRILLS	DJ543		Metric	Stub	D2.0	D13.0	114
	DJ544		Metric	Jobber	D2.0	D20.0	116
GOLD-P DRILLS	D1GP182 D8182		Inch	Jobber	D3/64	D3/4	124
	D1GP139		Inch	Jobber	A	Z	125
	D1GP138		Inch	Jobber	#56	#1	126
	D2GP185		Inch	Jobber	D3/64	D1/2	127
	D2GP186		Inch	Jobber	A	Z	128
	D2GP187		Inch	Jobber	#56	#1	129
	DLGP511		Inch	Jobber	D5/64	D1/2	130
	DLGP513		Inch	Jobber	A	Z	131

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
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DRILLING TOOLS APPLICATION TABLE

	ITEM	MODEL	INCH / METRIC	LENGTH	SIZE		PAGE
					MIN	MAX	
GOLD-P DRILLS	DLGP512		Inch	Jobber	#47	#1	132
	DLGP195		Metric	Jobber	D1.0	D13.0	133
	DLGP506		Metric	Jobber	D2.0	D13.0	135
STRAIGHT SHANK DRILLS	D1118		Inch	Screw Machine	D3/64	D1/2	144
	D1115		Inch	Screw Machine	A	Z	145
	D1119		Inch	Screw Machine	#60	#1	146
	D2146 D4146		Inch	Screw Machine	D3/64	D1/2	147
	D2147 D4147		Inch	Screw Machine	A	Z	148
	D2148 D4148		Inch	Screw Machine	#60	#1	149
	DN514		Inch	Screw Machine	D3/32	D1/2	151
	DN516		Inch	Screw Machine	A	Z	152
	DN515		Inch	Screw Machine	#47	#1	153
	DX517 DL517		Inch	Taper Length	D5/64	D1/2	154
	D4107		Metric	Screw Machine	D1.0	D31.0	155
AIRCRAFT DRILLS	DL601 DL604		Inch	Extension Length	D5/64	D1/2	166
	DL602 DL605		Inch	Extension Length	A	Z	167
	DL603 DL606		Inch	Extension Length	#43	#1	168
	D1631 D1634		Inch	Extension Length	D5/64	D1/2	169
	D1632 D1635		Inch	Extension Length	A	Z	170
	D1633 D1636		Inch	Extension Length	#43	#1	171
SILVER & DEMING DRILLS	D1191		Inch	—	D1/2	D1-1/2	176
MORSE TAPER SHANK DRILLS	D1211		Inch	—	D1/2	D2-1/2	182
NC-SPOTTING DRILLS	D2N90(90˚)		Inch		D1/8	D1	188
	D2N90(120˚)		Inch		D1/8	D1	188
CENTER DRILLS	D1C90		Inch	—	D3/64	D7/32	194

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
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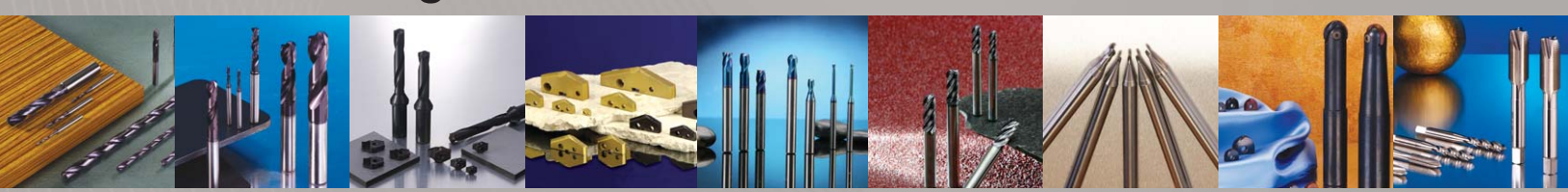
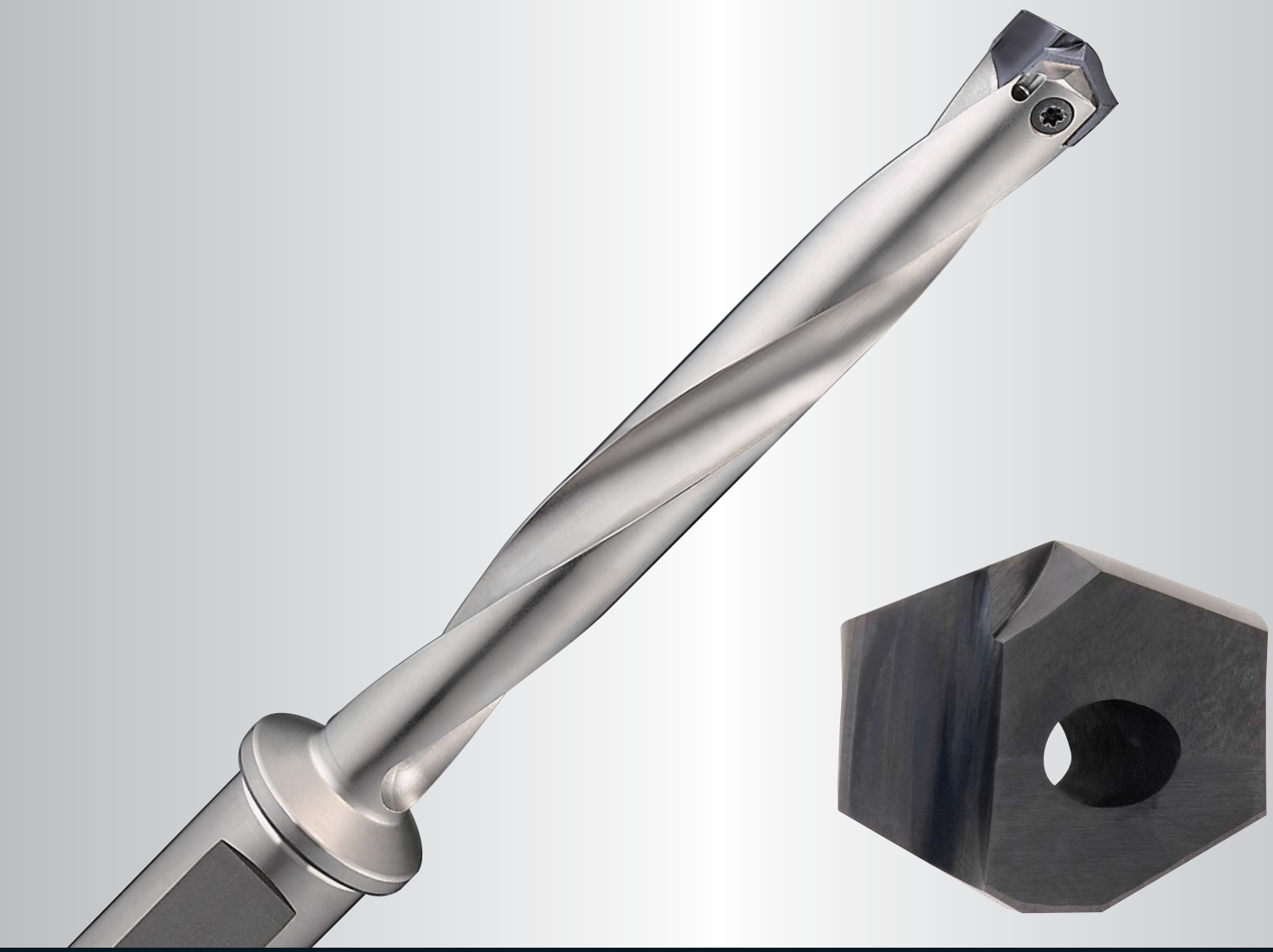
Global Cutting Tool Leader YG-1



CARBIDE INSERT

Being the best through innovation



i-Dream Drills

- **For Steels and Stainless Steel Alloys**

SELECTION GUIDE

ITEM	MODEL	DESCRIPTION	PAGE
Y03A / Y03B		*i*-**Dream Drills** General	32
YI3A / YI3B		*i*-**Dream Drills** INOX	
Y03B / Y03C		*i*-**Dream Drills** General	33
YI3B / YI3C		*i*-**Dream Drills** INOX	
Y03C / Y03D		*i*-**Dream Drills** General	34
YI3C / YI3D		*i*-**Dream Drills** INOX	
Y03E / Y03F		*i*-**Dream Drills** General	35
YI3E / YI3F		*i*-**Dream Drills** INOX	
Y03G / Y03H		*i*-**Dream Drills** General	36
YI3G / YI3H		*i*-**Dream Drills** INOX	
Y03I / Y03J		*i*-**Dream Drills** General	37
YI3I / YI3J		*i*-**Dream Drills** INOX	
		RECOMMENDED CUTTING CONDITIONS	38

Comparison with Split Point Drill, Spade Drill & Dream Drill

◎ : Excellent
○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
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YG i-Dream Drills

Y03A / YI3A
Y03B / YI3B

i-DREAM DRILL INSERTS & HOLDERS

- Features of *i-Dream Drill* Inserts

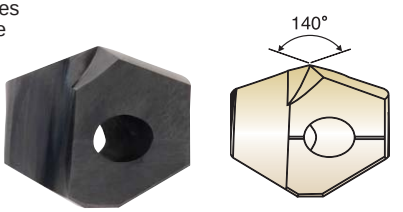
▶ Secure and accurate seating resulting in accurate repeatability and concentricity.

i-Dream Drill ***General***

▶ For most steels materials

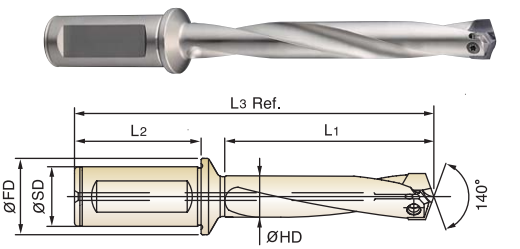
i-Dream Drill ***INOX***

▶ For tough,ductile materials and stainless steels
▶ Light,sharp cutting edge
▶ Minimize cutting forces
▶ Reduce built-up edge



- Features of *i-Dream Drill* Holders

▶ Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
▶ Innovative surface treatment that improves wear resistance and reduces corrosion.
▶ High Performance flute design allowing maximum chip evacuation and minimum interference.



cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
A Ø12.00 to Ø13.99 3.6mm Thick	Y03A01	YI3A01	.4724	12.00	3D 5D 7D	ZA0301 ZA0501 ZA0701	.4528	3 / 4	2	1	1-27 / 64 2-23 / 64 3-5 / 16	4-29 / 64 5-13 / 32 6-11 / 32	TA1213
	Y03A02	YI3A02	.4764	12.10									
	Y03A03	YI3A03	.4803	12.20									
	Y03A04	YI3A04	.4844	31 / 64									
	Y03A05	YI3A05	.4921	12.50	3D 5D 7D	ZA0302 ZA0502 ZA0702	.4724	3 / 4	2	1	1-15 / 32 2-29 / 64 3-7 / 16	4-1 / 2 5-31 / 64 6-15 / 32	
	Y03A06	YI3A06	.4961	12.60									
	Y03A07	YI3A07	.5000	1 / 2									
	Y03A08	YI3A08	.5039	12.80									
	Y03A09	YI3A09	.5079	12.90									
	Y03A10	YI3A10	.5118	13.00	3D 5D 7D	ZA0303 ZA0503 ZA0703	.4921	3 / 4	2	1	1-17 / 32 2-9 / 16 3-37 / 64	4-37 / 64 5-19 / 32 6-5 / 8	
	Y03A11	YI3A11	.5156	33 / 64									
	Y03A12	YI3A12	.5197	13.20									
	Y03A13	YI3A13	.5312	17 / 32									
	Y03A14	YI3A14	.5315	13.50	3D 5D 7D	ZA0304 ZA0504 ZA0704	.5118	3 / 4	2	1	1-19 / 32 2-21 / 32 3-23 / 32	4-39 / 64 5-43 / 64 6-47 / 64	TA1314
	Y03A15	YI3A15	.5354	13.60									
	Y03A16	YI3A16	.5394	13.70									
	Y03A17	YI3A17	.5433	13.80									
	Y03A18	YI3A18	.5469	35 / 64									
B Ø14.00 to Ø15.99 4mm Thick	Y03B01	YI3B01	.5512	14.00	3D 5D 7D	ZB0301 ZB0501 ZB0701	.5315	3 / 4	2	1	1-21 / 32 2-3 / 4 3-55 / 64	4-23 / 32 5-13 / 16 6-59 / 64	TB1415
	Y03B02	YI3B02	.5551	14.10									
	Y03B03	YI3B03	.5591	14.20									
	Y03B04	YI3B04	.5625	9 / 16									
	Y03B05	YI3B05	.5630	14.30									
	Y03B06	YI3B06	.5669	14.40									

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

YG i-Dream Drills

Y03B / YI3B
Y03C / YI3C

i-DREAM DRILL INSERTS & HOLDERS

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i-Dream Drill ***General***

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i-Dream Drill ***INOX***

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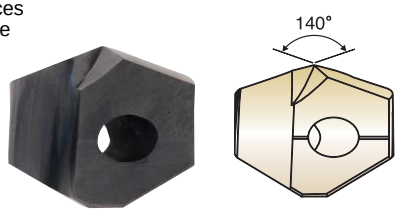
▶ Light,sharp cutting edge
▶ Minimize cutting forces
▶ Reduce built-up edge



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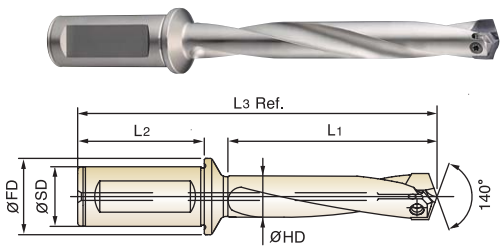

cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
B Ø14.00 to Ø15.99 4mm Thick	Y03B07	YI3B07	.5709	14.50	3D	ZB0302	.5512	3/4	2	1	1-23/32	4-51/64	TB1415
	Y03B08	YI3B08	.5748	14.60	5D	ZB0502					2-55/64	5-15/16	
	Y03B09	YI3B09	.5781	37/64	7D	ZB0702					4	7-5/64	
	Y03B10	YI3B10	.5827	14.80									
	Y03B11	YI3B11	.5906	15.00									TB1516
	Y03B12	YI3B12	.5938	19/32	3D	ZB0303	.5709	3/4	2	1	1-49/64	4-7/8	
	Y03B13	YI3B13	.5945	15.10	5D	ZB0503					2-61/64	6-3/64	
	Y03B14	YI3B14	.5984	15.20	7D	ZB0703					4-9/64	7-15/64	
	Y03B15	YI3B15	.6024	15.30									
	Y03B16	YI3B16	.6094	39/64									
	Y03B17	YI3B17	.6102	15.50									
	Y03B18	YI3B18	.6142	15.60	3D	ZB0304	.5906	3/4	2	1	1-53/64	4-29/32	
	Y03B19	YI3B19	.6181	15.70	5D	ZB0504					3-3/64	6-1/8	
	Y03B20	YI3B20	.6220	15.80	7D	ZB0704					4-17/64	7-11/32	
	Y03B21	YI3B21	.6250	5/8									
C Ø16.00 to Ø17.99 4.5mm Thick	Y03C01	YI3C01	.6299	16.00									TC1617
	Y03C02	YI3C02	.6335	16.09	3D	ZC0301	.6102	3/4	2	1	1-57/64	4-61/64	
	Y03C03	YI3C03	.6378	16.20	5D	ZC0501					3-5/32	6-7/32	
	Y03C04	YI3C04	.6406	41/64	7D	ZC0701					4-13/32	7-15/32	
	Y03C05	YI3C05	.6417	16.30									
	Y03C06	YI3C06	.6496	16.50	3D	ZC0302	.6299	3/4	2	1	1-61/64	5-1/32	
	Y03C07	YI3C07	.6562	21/32	5D	ZC0502					3-1/4	6-21/64	
	Y03C08	YI3C08	.6614	16.80	7D	ZC0702					4-35/64	7-5/8	

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

YG i-Dream Drills

Y03C / YI3C
Y03D / YI3D

i-DREAM DRILL INSERTS & HOLDERS

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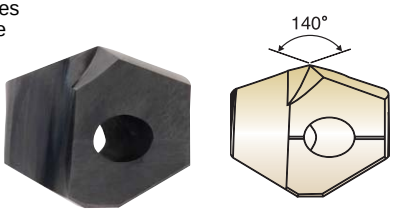
▶ Minimize cutting forces
▶ Reduce built-up edge



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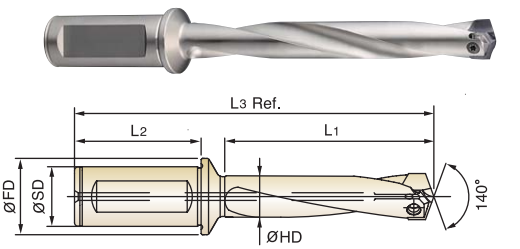

cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
C Ø16.00 to Ø17.99 4.5mm Thick	Y03C09	YI3C09	.6693	17.00	3D	ZC0303					2-1 / 64	5-5 / 64	TC1718
	Y03C10	YI3C10	.6919	43 / 64	5D	ZC0503	.6496	3 / 4	2	1	3-11 / 32	6-13 / 32	
	Y03C11	YI3C11	.6875	11 / 16	7D	ZC0703					4-11 / 16	7-3 / 4	
	Y03C12	YI3C12	.6890	17.50	3D	ZC0304					2-1 / 16	5-5 / 32	
	Y03C13	YI3C13	.7008	17.80	5D	ZC0504	.6693	3 / 4	2	1	3-7 / 16	6-17 / 32	
	Y03C14	YI3C14	.7031	45 / 64	7D	ZC0704					4-53 / 64	7-29 / 32	
D Ø18.00 to Ø19.99 5mm Thick	Y03D01	YI3D01	.7087	18.00	3D	ZD0301					2-1 / 8	5-1 / 2	TD1819
	Y03D02	YI3D02	.7188	23 / 32	5D	ZD0501	.6890	1	2-3 / 16	1-1 / 4	3-35 / 64	6-59 / 64	
					7D	ZD0701					4-61 / 64	8-11 / 32	
	Y03D03	YI3D03	.7283	18.50	3D	ZD0302					2-3 / 16	5-35 / 64	
	Y03D04	YI3D04	.7344	47 / 64	5D	ZD0502	.7087	1	2-3 / 16	1-1 / 4	3-41 / 64	7	
	Y03D05	YI3D05	.7402	18.80	7D	ZD0702					5-3 / 32	8-29 / 64	
	Y03D06	YI3D06	.7480	19.00	3D	ZD0303					2-1 / 4	5-43 / 64	TD1920
	Y03D07	YI3D07	.7500	3 / 4	5D	ZD0503	.7283	1	2-3 / 16	1-1 / 4	3-47 / 64	7-5 / 32	
	Y03D08	YI3D08	.7587	19.27	7D	ZD0703					5-15 / 64	8-21 / 32	
	Y03D09	YI3D09	.7656	49 / 64									
	Y03D10	YI3D10	.7677	19.50	3D	ZD0304					2-19 / 64	5-45 / 64	
	Y03D11	YI3D11	.7795	19.80	5D	ZD0504	.7480	1	2-3 / 16	1-1 / 4	3-27 / 32	7-15 / 64	
	Y03D12	YI3D12	.7812	25 / 32	7D	ZD0704					5-3 / 8	8-25 / 32	

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

YG i-Dream Drills

Y03E / YI3E
Y03F / YI3F

i-DREAM DRILL INSERTS & HOLDERS

- Features of *i-Dream Drill* Inserts

▶ Secure and accurate seating resulting in accurate repeatability and concentricity.

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i-Dream Drill ***INOX***

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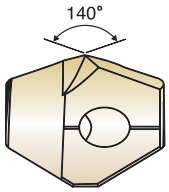

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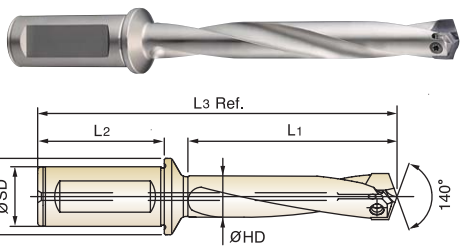


cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
E Ø20.00 to Ø21.99 5.5mm Thick	Y03E01	YI3E01	.7874	20.00	3D	ZE0301	.7638	1	2-3 / 16	1-1 / 4	2-23 / 64	5-23 / 32	TE2021
	Y03E02	YI3E02	.7969	51 / 64	5D	ZE0501					3-15 / 16	7-9 / 32	
					7D	ZE0701					5-33 / 64	8-55 / 64	
	Y03E03	YI3E03	.8071	20.50	3D	ZE0302	.7835	1	2-3 / 16	1-1 / 4	2-27 / 64	5-51 / 64	
	Y03E04	YI3E04	.8125	13 / 16	5D	ZE0502					4-1 / 32	7-13 / 32	
	Y03E05	YI3E05	.8150	20.70	7D	ZE0702					5-21 / 32	9-1 / 64	
	Y03E06	YI3E06	.8268	21.00	3D	ZE0303	.8031	1	2-3 / 16	1-1 / 4	2-31 / 64	5-7 / 8	TE2122
	Y03E07	YI3E07	.8281	53 / 64	5D	ZE0503					4-9 / 64	7-33 / 64	
	Y03E08	YI3E08	.8438	27 / 32	7D	ZE0703					5-25 / 32	9-11 / 64	
	Y03E09	YI3E09	.8465	21.50	3D	ZE0304	.8228	1	2-3 / 16	1-1 / 4	2-35 / 64	5-29 / 32	
	Y03E10	YI3E10	.8543	21.70	5D	ZE0504					4-15 / 64	7-19 / 32	
	Y03E11	YI3E11	.8594	55 / 64	7D	ZE0704					5-59 / 64	9-19 / 64	
F Ø22.00 to Ø23.99 6mm Thick	Y03F01	YI3F01	.8661	22.00	3D	ZF0301	.8425	1	2-3 / 16	1-1 / 4	2-19 / 32	5-63 / 64	TF2223
	Y03F02	YI3F02	.8750	7 / 8	5D	ZF0501					4-21 / 64	7-23 / 32	
					7D	ZF0701					6-1 / 16	9-29 / 64	
	Y03F03	YI3F03	.8858	22.50	3D	ZF0302	.8622	1	2-3 / 16	1-1 / 4	2-21 / 32	6-1 / 32	
	Y03F04	YI3F04	.8906	57 / 64	5D	ZF0502					4-27 / 64	7-51 / 64	
	Y03F05	YI3F05	.8937	22.70	7D	ZF0702					6-13 / 64	9-9 / 16	
	Y03F06	YI3F06	.9055	23.00	3D	ZF0303	.8819	1	2-3 / 16	1-1 / 4	2-23 / 32	6-7 / 64	TF2324
	Y03F07	YI3F07	.9062	29 / 32	5D	ZF0503					4-17 / 32	7-29 / 32	
	Y03F08	YI3F08	.9219	59 / 64	7D	ZF0703					6-11 / 32	9-23 / 32	
	Y03F09	YI3F09	.9252	23.50	3D	ZF0304	.9016	1	2-3 / 16	1-1 / 4	2-25 / 32	6-3 / 16	
	Y03F10	YI3F10	.9331	23.70	5D	ZF0504					4-5 / 8	8-1 / 32	
	Y03F11	YI3F11	.9375	15 / 16	7D	ZF0704					6-15 / 32	9-7 / 8	

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

YG i-Dream Drills

Y03G / YI3G
Y03H / YI3H

i-DREAM DRILL INSERTS & HOLDERS

- Features of *i-Dream Drill* Inserts

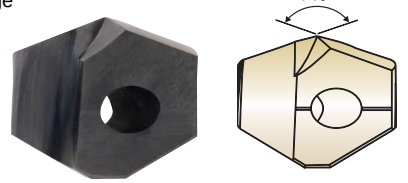
▶ Secure and accurate seating resulting in accurate repeatability and concentricity.

i-Dream Drill ***General***

▶ For most steels materials

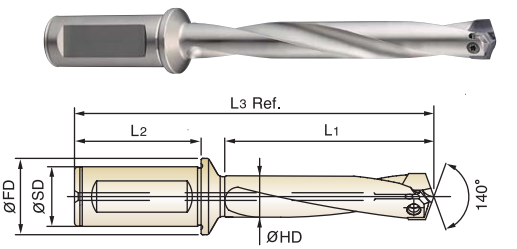
i-Dream Drill ***INOX***

▶ For tough,ductile materials and stainless steels
▶ Light,sharp cutting edge
▶ Minimize cutting forces
▶ Reduce built-up edge



- Features of *i-Dream Drill* Holders

▶ Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
▶ Innovative surface treatment that improves wear resistance and reduces corrosion.
▶ High Performance flute design allowing maximum chip evacuation and minimum interference.



cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
G Ø24.00 to Ø25.99 6.5mm Thick	Y03G01	YI3G01	.9449	24.00	3D	ZG0301	.9213	1-1/4	2-3/8	1-15/32	2-53/64	6-1/2	TG2425
					5D	ZG0501					4-23/32	8-25/64	
	Y03G02	YI3G02	.9531	61/64	7D	ZG0701					6-39/64	10-9/32	
	Y03G03	YI3G03	.9646	24.50	3D	ZG0302	.9409	1-1/4	2-3/8	1-15/32	2-57/64	6-17/32	
	Y03G04	YI3G04	.9688	31/32	5D	ZG0502					4-53/64	8-15/32	
	Y03G05	YI3G05	.9724	24.70	7D	ZG0702					6-3/4	10-25/64	
	Y03G06	YI3G06	.9843	63/64	3D	ZG0303	.9606	1-1/4	2-3/8	1-15/32	2-61/64	6-39/64	TG2526
	Y03G07	YI3G07	1.0000	1	5D	ZG0503					4-59/64	8-37/64	
					7D	ZG0703					6-57/64	10-35/64	
	Y03G08	YI3G08	1.0039	25.50	3D	ZG0304	.9803	1-1/4	2-3/8	1-15/32	3-1/64	6-47/64	
	Y03G09	YI3G09	1.0106	25.67	5D	ZG0504					5-1/64	8-47/64	
	Y03G10	YI3G10	1.0118	25.70	7D	ZG0704					7-1/32	10-3/4	
	Y03G11	YI3G11	1.0156	1-1/64									
H Ø26.00 to Ø27.99 7.1mm Thick	Y03H01	YI3H01	1.0236	26.00	3D	ZH0301	1.0000	1-1/4	2-3/8	1-15/32	3-5/64	6-3/4	TH2627
					5D	ZH0501					5-1/8	8-51/64	
	Y03H02	YI3H02	1.0312	1-1/32	7D	ZH0701					7-11/64	10-27/32	
	Y03H03	YI3H03	1.0433	26.50	3D	ZH0302	1.0197	1-1/4	2-3/8	1-15/32	3-1/8	6-51/64	
	Y03H04	YI3H04	1.0469	1-3/64	5D	ZH0502					5-7/32	8-7/8	
	Y03H05	YI3H05	1.0625	1-1/16	7D	ZH0702					7-19/64	10-31/32	
	Y03H06	YI3H06	1.0630	27.00	3D	ZH0303	1.0394	1-1/4	2-3/8	1-15/32	3-3/16	6-7/8	TH2728
					5D	ZH0503					5-5/16	9	
					7D	ZH0703					7-7/16	11-1/8	
	Y03H07	YI3H07	1.0827	27.50	3D	ZH0304	1.0591	1-1/4	2-3/8	1-15/32	3-1/4	6-29/32	
					5D	ZH0504					5-13/32	9-5/64	
	Y03H08	YI3H08	1.0938	1-3/32	7D	ZH0704					7-37/64	11-15/64	

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

i-Dream Drills

Y03I / YI3I
Y03J / YI3J

i-DREAM DRILL INSERTS & HOLDERS

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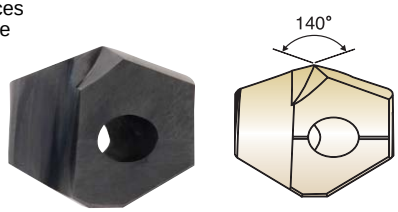

- Features of *i-Dream Drill* Holders

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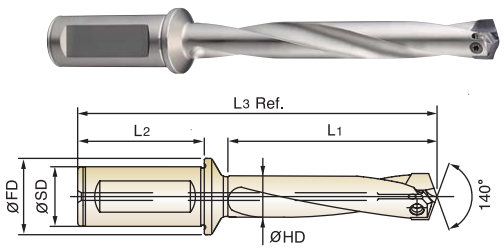
▶ Innovative surface treatment that improves wear resistance and reduces corrosion.
▶ High Performance flute design allowing maximum chip evacuation and minimum interference.



cutting conditions : p.38~39

Unit : inch

Series Range	Insert EDP No.		Insert O.D.		Length	Holder EDP No.	Diameter HD	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth	Overall Length	Torx Screw No.
	TiAlN	TiCN	h7										
(mm)	General	INOX	dec.	inch / mm				SD	L2	FD	L1	L3 Ref.	
I Ø28.00 to Ø29.99 7.7mm Thick	Y03I01	YI3I01	1.1024	28.00	3D	ZI0301	1.0748	1-1 / 4	2-3 / 8	1-15 / 32	3-5 / 16	7	TI2829
					5D	ZI0501					5-33 / 64	9-15 / 64	
	Y03I02	YI3I02	1.1094	1*7 / 64	7D	ZI0701					7-23 / 32	11-7 / 16	
	Y03I03	YI3I03	1.1220	28.50	3D	ZI0302	1.0945	1-1 / 4	2-3 / 8	1-15 / 32	3-23 / 64	7-1 / 16	
					5D	ZI0502					5-39 / 64	9-5 / 16	
	Y03I04	YI3I04	1.1250	1*1 / 8	7D	ZI0702					7-55 / 64	11-9 / 16	
	Y03I05	YI3I05	1.1417	29.00	3D	ZI0303	1.1142	1-1 / 4	2-3 / 8	1-15 / 32	3-27 / 64	7-3 / 16	TI2930
					5D	ZI0503					5-45 / 64	9-15 / 32	
	Y03I06	YI3I06	1.1562	1*5 / 32	7D	ZI0703					7-63 / 64	11-3 / 4	
	Y03I07	YI3I07	1.1614	29.50	3D	ZI0304	1.1339	1-1 / 4	2-3 / 8	1-15 / 32	3-31 / 64	7-7 / 32	
					5D	ZI0504					5-13 / 16	9-35 / 64	
	Y03I08	YI3I08	1.1719	1*11 / 64	7D	ZI0704					8-1 / 8	11-7 / 8	
J Ø30.00 to Ø31.99 8mm Thick	Y03J01	YI3J01	1.1811	30.00	3D	ZJ0301	1.1535	1-1 / 4	2-3 / 8	1-15 / 32	3-35 / 64	7-21 / 64	TJ2831
					5D	ZJ0501					5-29 / 32	9-45 / 64	
	Y03J02	YI3J02	1.1875	1*3 / 16	7D	ZJ0701					8-17 / 64	12-1 / 16	
	Y03J03	YI3J03	1.2008	30.50	3D	ZJ0302	1.1732	1-1 / 4	2-3 / 8	1-15 / 32	3-39 / 64	7-3 / 8	
	Y03J04	YI3J04	1.2031	1*11 / 64	5D	ZJ0502					6	9-25 / 32	
	Y03J05	YI3J05	1.2188	1*7 / 32	7D	ZJ0702					8-13 / 32	12-11 / 64	
	Y03J06	YI3J06	1.2205	31.00	3D	ZJ0303	1.1929	1-1 / 4	2-3 / 8	1-15 / 32	3-21 / 32	7-13 / 32	TJ3132
					5D	ZJ0503					6-7 / 64	9-55 / 64	
					7D	ZJ0703					8-35 / 64	12-19 / 64	
	Y03J07	YI3J07	1.2402	31.50	3D	ZJ0304	1.2126	1-1 / 4	2-3 / 8	1-15 / 32	3-23 / 32	7-17 / 32	
					5D	ZJ0504					6-13 / 64	10-1 / 64	
	Y03J08	YI3J08	1.2500	1*1 / 4	7D	ZJ0704					8-11 / 16	12-31 / 64	

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
Y03*	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎		
YI3*	○	○		○				○		○		◎			○	○

METRIC

Material			Tensile Strength	Hardness		Cutting Speed	Feed [mm/rev]				
			[N/mm²]	HB	HRc	Vc [M/min]	Ø12.0 ~ Ø14.9	Ø15.0 ~ Ø17.9	Ø18.0 ~ Ø21.9	Ø22.0 ~ Ø26.9	Ø27.0 ~ Ø31.9
Non-alloyed steels, Cast steels Free-machining steels	1213, 13L13, 1215, 12L14,1118 etc	Y03□/ Y13□	~500	100~150		95~120	0.16~0.28	0.21~0.35	0.27~0.40	0.34~0.52	0.37~0.55
			500~850	150~250	~24	80~105	0.14~0.24	0.21~0.35	0.27~0.40	0.34~0.52	0.37~0.55
Low-alloyed steels, Cast steels(<5%) Carbon steels	1015, 1020, 1140, 1025,1035, 1050, 1045, 1055 etc		~450	85~125		90~115	0.14~0.25	0.20~0.33	0.25~0.39	0.31~0.47	0.34~0.50
			450~755	125~225	~19	70~90	0.12~0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.33~0.49
			755~900	225~265	19~27	60~80	0.12~0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.33~0.49
			900~1200	265~350	27~37	55~70	0.10~0.16	0.15~0.25	0.21~0.30	0.25~0.38	0.29~0.43
Alloyed steels	8620, 4130, 4137, 4140,6150 etc		~600	125~175	~7	80~100	0.14~0.24	0.17~0.28	0.22~0.32	0.30~0.46	0.34~0.50
			600~800	175~235	7~22	70~90	0.12~0.20	0.17~0.28	0.22~0.32	0.30~0.46	0.34~0.50
			800~950	235~280	22~29	60~80	0.12~0.20	0.15~0.25	0.22~0.32	0.30~0.46	0.34~0.50
			950~1110	280~330	29~35	55~70	0.10~0.16	0.13~0.21	0.21~0.30	0.25~0.38	0.29~0.43
			1110~1230	330~360	35~39	45~60	0.08~0.12	0.13~0.21	0.21~0.30	0.25~0.38	0.29~0.43
High-alloyed steels	A355. 9840, 4340 etc		600~1020	225~300	19~32	45~60	0.12~0.20	0.15~0.25	0.21~0.30	0.20~0.31	0.24~0.35
			1020~1200	300~355	32~38	40~55	0.10~0.16	0.11~0.18	0.21~0.30	0.20~0.31	0.24~0.35
			1200~1330	355~390	38~42	40~50	0.08~0.12	0.09~0.14	0.18~0.26	0.19~0.29	0.23~0.34
Structural steels	A36, A516, A182 etc		350~500	100~150		75~95	0.14~0.24	0.21~0.35	0.27~0.39	0.29~0.44	0.32~0.47
			500~850	150~250	~24	60~75	0.12~0.20	0.20~0.33	0.22~0.32	0.25~0.38	0.29~0.43
			850~1200	250~355	24~38	50~65	0.10~0.16	0.17~0.28	0.21~0.30	0.21~0.32	0.26~0.38
Tool steels	H13, H21, A2, S1 etc		500~705	150~210	~16	50~65	0.10~0.16	0.13~0.21	0.18~0.26	0.20~0.31	0.24~0.35
			705~950	210~280	16~29	40~50	0.10~0.16	0.13~0.21	0.18~0.26	0.20~0.31	0.24~0.35
Grey cast iron	Pearlitic, Ferritic		500~700	150~210	~16	100~125	0.15~0.26	0.20~0.37	0.27~0.42	0.36~0.51	0.40~0.55
	Pearlitic		700~850	210~250	16~24	75~95	0.11~0.20	0.16~0.29	0.20~0.30	0.25~0.35	0.29~0.40
Cast iron nodular	Ferritic		540	165	4	95~120	0.13~0.22	0.17~0.31	0.21~0.32	0.28~0.40	0.32~0.44
	Pearlitic		850	250	24	75~95	0.11~0.20	0.14~0.26	0.19~0.29	0.25~0.35	0.29~0.40
Malleable cast iron	Ferritic		450	125		100~125	0.13~0.22	0.17~0.31	0.21~0.32	0.28~0.40	0.32~0.44
	Pearlitic		780	230	21	75~95	0.11~0.18	0.14~0.26	0.19~0.29	0.25~0.35	0.29~0.40
Aluminum alloys (Wrought)	not heat treatable			65		250~330	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55	0.50~0.60
	hardened			150		200~250	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55	0.50~0.60
Aluminum alloys (Cast)	≤12% Si, not heat treatable			75		200~50	0.25~0.35	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55
	≤12% Si, hardened			90		150~220	0.25~0.35	0.30~0.40	0.35~0.45	0.40~0.50	0.45~0.55
	>12% Si, not heat treatable			130		100~200	0.20~0.30	0.25~0.35	0.30~0.40	0.35~0.45	0.40~0.50
Copper alloys	Free machining(Pb>1%)			110		115~145	0.16~0.28	0.23~0.36	0.29~0.36	0.37~0.45	0.41~0.48
	Brass			90		145~185	0.17~0.29	0.24~0.37	0.30~0.38	0.38~0.46	0.42~0.49
	Electrolitic copper			100		95~120	0.06~0.09	0.09~0.13	0.11~0.13	0.15~0.18	0.19~0.22
Non ferrous material	Duroplastics										
	Fiber plastics										
	Hard rubber										
Stainless steels	Austenitic and Austenitic / ferritic	Y13□	450~610	135~185	~9	45~60	0.10~0.16	0.12~0.18	0.14~0.20	0.15~0.26	0.18~0.28
			610~930	185~275	9~28	30~45	0.08~0.14	0.09~0.15	0.10~0.16	0.12~0.20	0.14~0.22

RPM = revolution per minute (rev/min)
M/min = surface meter per minute(M/min)
DIA. = diameter of drill (mm)
mm/rev = feed rate(mm/rev)

*Formulas :

$$\text{M/min} = \frac{(\text{RPM}) \cdot \pi \cdot (\text{DIA.})}{1000}$$

$$\text{mm/min} = (\text{RPM}) \cdot (\text{mm/rev})$$

$$\text{RPM} = \frac{(\text{M/min}) \cdot 1000}{(\pi) \cdot (\text{DIA.})}$$

▶The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
▶Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.
▶For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140° point angle to min. 2/3 cutting diameter.
The use of the centering pre-hole improves hole location, roundness and surface finish.

INCH

Material			Tensile Strength	Hardness		Cutting Speed	Feed [IPR]				
			MPa	HB	HRc	Vc [SFM]	∅31/64 ~ ∅37/64	∅19/32 ~ ∅45/64	∅23/32 ~ ∅55/64	∅7/8 ~ ∅1-1/16	∅1-3/32 ~ ∅1-1/4
Non-alloyed steels, Cast steels Free-machining steels	1213, 13L13, 1215, 12L14,1118 etc	Y03□/Y13□	~500	100~150		312~394	.006~.011	.008~.014	.011~.016	.013~.020	.015~.022
			500~850	150~250	~24	262~344	.006~.009	.008~.014	.011~.016	.013~.020	.015~.022
Low-alloyed steels, Cast steels(<5%) Carbon steels	1015, 1020, 1140, 1025,1035, 1050, 1045, 1055 etc		~450	85~125		295~377	.006~.010	.008~.013	.010~.015	.012~.019	.013~.020
			450~755	125~225	~19	230~295	.005~.008	.007~.011	.009~.013	.012~.018	.013~.019
			755~900	225~265	19~27	197~262	.005~.008	.007~.011	.009~.013	.012~.018	.013~.019
			900~1200	265~350	27~37	180~230	.004~.006	.006~.010	.008~.012	.010~.015	.011~.017
Alloyed steels	8620, 4130, 4137, 4140,6150 etc		~600	125~175	~7	262~328	.006~.009	.007~.011	.009~.013	.012~.018	.013~.020
			600~800	175~235	7~22	230~295	.005~.008	.007~.011	.009~.013	.012~.018	.013~.020
			800~950	235~280	22~29	197~262	.005~.008	.006~.010	.009~.013	.012~.018	.013~.020
			950~1110	280~330	29~35	180~230	.004~.006	.005~.008	.008~.012	.010~.015	.011~.017
			1110~1230	330~360	35~39	148~197	.003~.005	.005~.008	.008~.012	.010~.015	.011~.017
High-alloyed steels	A355. 9840, 4340 etc		600~1020	225~300	19~32	148~197	.005~.008	.006~.010	.008~.012	.008~.012	.009~.014
			1020~1200	300~355	32~38	131~180	.004~.006	.004~.007	.008~.012	.008~.012	.009~.014
			1200~1330	355~390	38~42	131~164	.003~.005	.004~.006	.007~.010	.007~.011	.009~.013
Structural steels	A36, A516, A182 etc		350~500	100~150		246~312	.006~.009	.008~.014	.011~.015	.011~.017	.013~.019
			500~850	150~250	~24	197~246	.005~.008	.008~.013	.009~.013	.010~.015	.011~.017
			850~1200	250~355	24~38	164~213	.004~.006	.007~.011	.008~.012	.008~.013	.010~.015
Tool steels	H13, H21, A2, S1 etc		500~705	150~210	~16	164~213	.004~.006	.005~.008	.007~.010	.008~.012	.009~.014
			705~950	210~280	16~29	131~164	.004~.006	.005~.008	.007~.010	.008~.012	.009~.014
Grey cast iron	Pearlitic, Ferritic		500~700	150~210	~16	328~410	.006~.010	.008~.015	.011~.017	.014~.020	.016~.022
	Pearlitic		700~850	210~250	16~24	246~312	.004~.008	.006~.011	.008~.012	.010~.014	.011~.016
Cast iron nodular	Ferritic		540	165	4	312~394	.005~.009	.007~.012	.008~.013	.011~.016	.013~.017
	Pearlitic		850	250	24	246~312	.004~.008	.006~.010	.007~.011	.010~.014	.011~.016
Malleable cast iron	Ferritic		450	125		328~410	.005~.009	.007~.012	.008~.013	.011~.016	.013~.017
	Pearlitic		780	230	21	246~312	.004~.007	.006~.010	.007~.011	.010~.014	.011~.016
Aluminum alloys (Wrought)	not heat treatable			65		820~1083	.0118~.0157	.0138~.0177	.0157~.0197	.0177~.0217	.0197~.0236
	hardened			150		656~820	.0118~.0157	.0138~.0177	.0157~.0197	.0177~.0217	.0197~.0236
Aluminum alloys (Cast)	≤12% Si, not heat treatable			75		656~820	.0098~.0138	.0118~.0157	.0138~.0177	.0157~.0197	.0177~.0217
	≤12% Si, hardened			90		492~722	.0098~.0138	.0118~.0157	.0138~.0177	.0157~.0197	.0177~.0217
	>12% Si, not heat treatable			130		328~656	.0079~.0118	.0098~.0138	.0118~.0157	.0138~.0177	.0157~.0197
Copper alloys	Free machining(Pb>1%)			110		377~476	.006~.011	.009~.014	.011~.014	.015~.018	.016~.019
	Brass			90		476~607	.007~.011	.009~.015	.012~.015	.015~.018	.017~.019
	Electrolitic copper			100		312~394	.002~.004	.004~.005	.004~.005	.006~.007	.007~.009
Non ferrous material	Duroplastics										
	Fiber plastics										
	Hard rubber										
Stainless steels	Austenitic and Austenitic / ferritic	Y13□	450~610	135~185	~9	145~197	.004~.006	.005~.007	.006~.008	.006~.011	.007~.011
			610~930	185~275	9~28	89~145	.003~.005	.004~.006	.004~.006	.005~.008	.006~.009

RPM = revolution per minute (rev/min)
SFM = surface feet per minute (ft/min)
DIA. = diameter of drill (inch)
IPR = feed rate (inch/rev)
IPM = inch per minute penetration rate

*Formulas :

$$SFM = \frac{(RPM) \cdot \pi \cdot (DIA.)}{12}$$

$$IPM = (RPM) \cdot (IPR)$$

$$RPM = \frac{(SFM) \cdot 12}{(\pi) \cdot (DIA.)}$$

▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
▶ Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.
▶ For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140° point angle to min. 2/3 cutting diameter.
The use of the centering pre-hole improves hole location, roundness and surface finish.

Assembly of *i*-Dream Drills

Make sure to clean the insert and insert seat.

Slide the drill insert into the slot of the holder and press down the insert to touch the bottom of the slot.

After confirming the insert is pressed down to the bottom of the slot, tighten the screw using anti-seize compound.

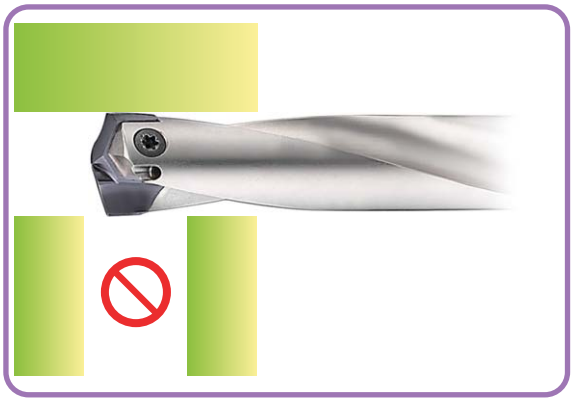
WRENCH TYPE	PRODUCT No.	T-HANDLE No.	SERIES
WING TYPE 	TWWT08	—	A
			B
			C
TORX BIT TYPE 	TWBT15	TWH600 	D
	TWBT20		E, F, G
	TWBT25		H, I, J

Use the wing type or T-type wrench.

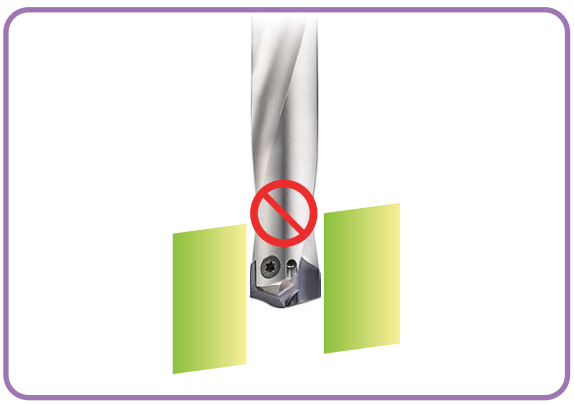
▶ Need to use appropriate wrenches and screws as indicated.

▶ It's important to tighten up the screw properly.

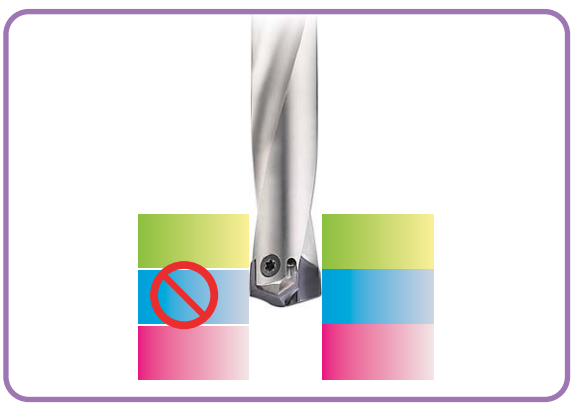
CAUTION-NOT RECOMMENDABLE APPLICATION



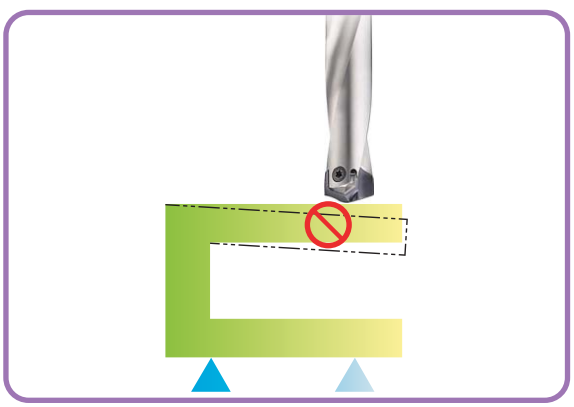
Intersecting cross hole is bigger than the drill insert's Margin Length.



Material with slanting entrance and exit over 7 degree. (If drilling 7 degree or under slanting surface, reduce the feed about 30-50 %)

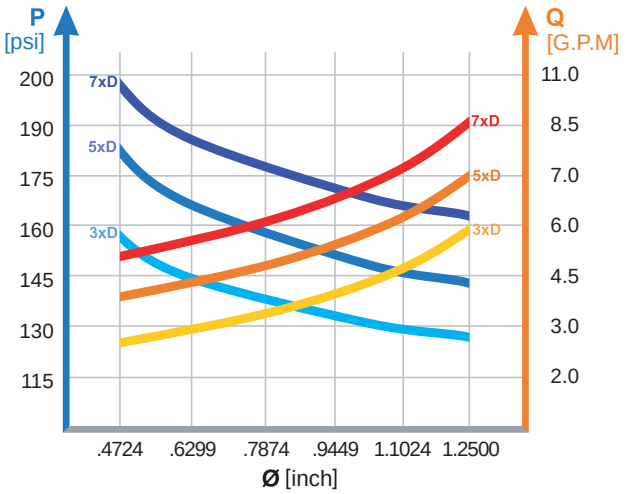


For drilling stacked plates, minimize the space between the plates.
The space stacked plates can cause insert breakage or poor chip control.



The material needs to be fixtured securely before drilling.

RECOMMENDED COOLANT PRESSURE AND FLOW RATE ON VERTICAL DRILLING



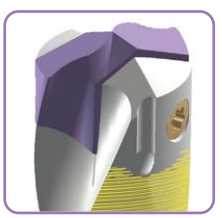
- Recommended emulsion mix is 6% - 8%.
- For Drilling in Stainless and High Strength steels, a mix of 10% is recommended.
- For horizontal drilling, 30% reduction on the coolant pressure and flow rate is possible.
- Dry drilling is possible for 1-2xD drilling. But not recommended.

TROUBLE SHOOTING

1) Heavy flank wear / Fast flank wear
- Reduce cutting speed
- Increase feed

3) Build up on cutting edge
- Increase cutting speed
- Use a coated insert

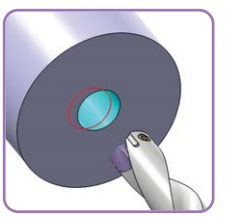
5) Wear of land margin
- Rigid clamping of workpiece
- Reduce cutting speed
- Increase coolant flow



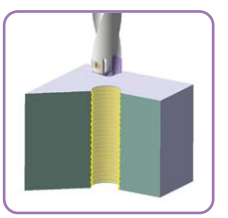
7) Scratching on holder
- Rigid clamping of workpiece
- Reduce feed
- Increase coolant flow

2) Chipping on cutting edge
- Reduce feed
- Check the rigidity of spindle and chuck
- Rigid clamping of workpiece

4) Chipping or break down on outer corner
- Reduce feed
- Rigid clamping of workpiece



6) Unsatisfactory positioning of the hole
- Rigid clamping of workpiece
- Reduce feed during entrance or exit



8) Unsatisfactory surface finish
- Rigid clamping of workpiece
- Increase coolant flow and pressure

CARBIDE

Being the best through innovation

DREAM DRILLS

- **WITH & WITHOUT COOLANT HOLES**
  General Purpose 30Rc to 50Rc Alloys

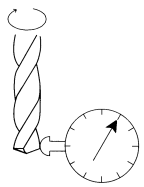
SOLID CARBIDE DREAM DRILLS (with & without Coolant Holes)

General Purpose 30Rc to 50Rc Alloys

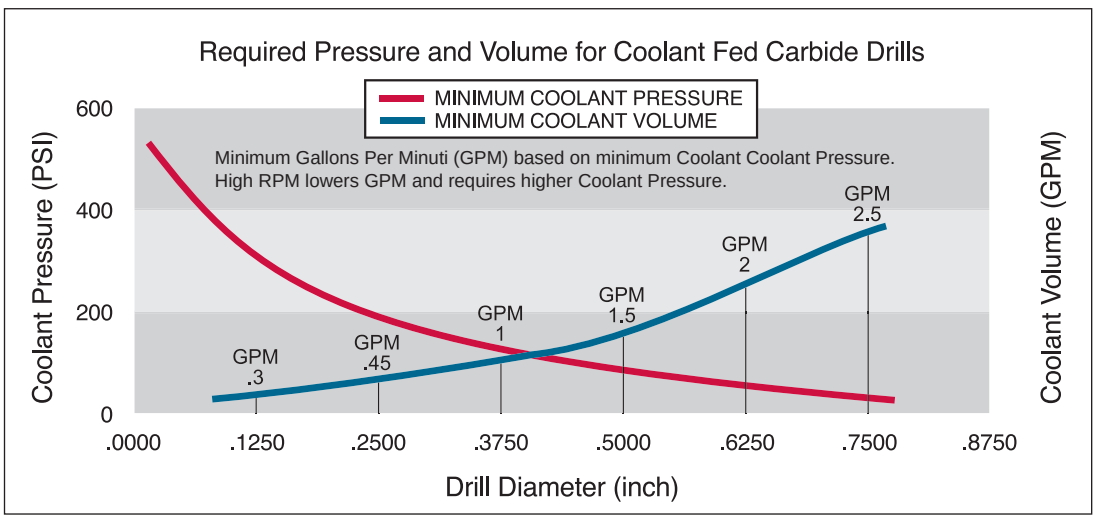
ITEM	MODEL	DESCRIPTION		SIZE MIN	SIZE MAX	PAGE
INCH						
3XD DH414		CARBIDE, DREAM DRILLS without COOLANT HOLES	*SHORT*	D1/8	D5/8	46
3XD DH416		CARBIDE, DREAM DRILLS with COOLANT HOLES	*SHORT*	D1/8	D5/8	47
5XD DH418		CARBIDE, DREAM DRILLS with COOLANT HOLES	*LONG*	D13/64	D1/2	48
METRIC						
3XD DH404		CARBIDE, DREAM DRILLS without COOLANT HOLES	*STUB*	D3.0	D20.0	49
3XD DH406		CARBIDE, DREAM DRILLS with COOLANT HOLES	*SHORT*	D3.0	D20.0	51
5XD DH424		CARBIDE, DREAM DRILLS without COOLANT HOLES	*LONG*	D1.0	D2.9	53
5XD DH408		CARBIDE, DREAM DRILLS with COOLANT HOLES	*LONG*	D1.0	D20.0	54
8XD DH421		CARBIDE, DREAM DRILLS with COOLANT HOLES	*EXTRA LONG*	D3.0	D14.0	57
		RECOMMENDED CUTTING CONDITIONS				59

◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				
○	◎	◎			○		○				



• Radial run out at cutting lip must not exceed .001



DREAM DRILLS

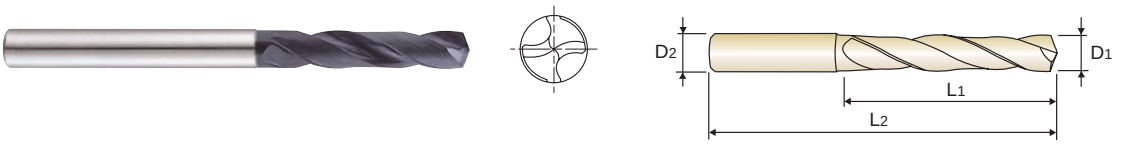
DH414 SERIES

CARBIDE, DREAM DRILLS without COOLANT HOLES — SHORT

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ⌀D1: See page 247, Shank Tolerance ⌀D2: -.0001 -.0005



MG | h6 | 140° | P.59

$D_1 = D_2$
3 × D

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
TiAlN	$D_1 = D_2$		L_1	L_2
0081ATF	1/8	.1250	45/64	1-59/64
0091ATF	9/64	.1406	25/32	2-3/64
0101ATF	5/32	.1562	7/8	2-3/16
0111ATF	11/64	.1719	15/16	2-9/32
0121ATF	3/16	.1875	1	2-7/16
0131ATF	13/64	.2031	1	2-7/16
0141ATF	7/32	.2188	1-1/8	2-5/8
0151ATF	15/64	.2344	1-1/8	2-5/8
0161ATF	1/4	.2500	1-5/8	3-3/16
2061ATF	F	.2570	1-11/16	3-17/64
0171ATF	17/64	.2656	1-11/16	3-17/64
2091ATF	I	.2720	1-11/16	3-17/64
0181ATF	9/32	.2812	1-3/4	3-7/16
0191ATF	19/64	.2969	1-7/8	3-9/16
0201ATF	5/16	.3125	1-7/8	3-9/16
0211ATF	21/64	.3281	2-1/16	3-3/4
2171ATF	Q	.3320	2-1/16	3-3/4

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
TiAlN	$D_1 = D_2$		L_1	L_2
0221ATF	11/32	.3438	2-3/16	3-7/8
0231ATF	23/64	.3594	2-9/32	4
2211ATF	U	.3680	2-9/32	4
0241ATF	3/8	.3750	2-3/8	4-1/8
0251ATF	25/64	.3906	2-3/8	4-1/8
0261ATF	13/32	.4062	2-5/8	4-13/32
0271ATF	27/64	.4219	2-11/16	4-1/2
0281ATF	7/16	.4375	2-13/16	4-5/8
0291ATF	29/64	.4531	2-7/8	4-3/4
0301ATF	15/32	.4688	2-7/8	4-3/4
0311ATF	31/64	.4844	3	5-5/16
0321ATF	1/2	.5000	3-1/16	5-3/8
0331ATF	33/64	.5156	3-11/32	5-11/16
0341ATF	17/32	.5312	3-11/32	5-11/16
0361ATF	9/16	.5625	3-1/2	5-15/16
0371ATF	37/64	.5781	3-37/64	6
0401ATF	5/8	.6250	3-25/3	6-19/64

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

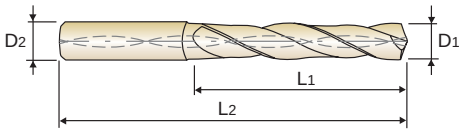
CARBIDE, DREAM DRILLS with COOLANT HOLES

SHORT

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005



MG | h6 | 140° | P.59

3 × D

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
0081BTF	1/8	.1250	15/64	1.102	2.992
0111BTF	11/64	.1719	15/64	1.417	3.386
0121BTF	3/16	.1875	15/64	1.575	3.543
0131BTF	13/64	.2031	15/64	1.082	3.228
0141BTF	7/32	.2188	15/64	1.181	3.228
0151BTF	15/64	.2344	15/64	1.181	3.228
0161BTF	1/4	.2500	17/64	1.279	3.465
2061BTF	F	.2570	17/64	1.279	3.465
0171BTF	17/64	.2656	17/64	1.378	3.465
2091BTF	I	.2720	.2720	1.378	3.465
0181BTF	9/32	.2812	5/16	1.476	3.701
0191BTF	19/64	.2969	5/16	1.476	3.701
0201BTF	5/16	.3125	5/16	1.575	3.701
0211BTF	21/64	.3281	11/32	1.673	3.937
2171BTF	Q	.3320	11/32	1.673	3.937
0221BTF	11/32	.3438	11/32	1.772	3.937
0231BTF	23/64	.3594	25/64	1.870	4.174
2211BTF	U	.3680	25/64	1.870	4.174

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
0241BTF	3/8	.3750	25/64	1.969	4.174
0251BTF	25/64	.3906	25/64	1.969	4.174
0261BTF	13/32	.4062	27/64	2.067	4.567
0271BTF	27/64	.4219	27/64	2.165	4.567
0281BTF	7/16	.4375	15/32	2.264	4.803
0291BTF	29/64	.4531	15/32	2.264	4.803
0301BTF	15/32	.4688	15/32	2.362	4.803
0311BTF	31/64	.4844	1/2	2.461	5.039
0321BTF	1/2	.5000	1/2	2.559	5.039
0331BTF	33/64	.5156	35/64	2.657	5.276
0341BTF	17/32	.5312	35/64	2.756	5.276
0351BTF	35/64	.5469	35/64	2.756	5.276
0361BTF	9/16	.5625	37/64	2.854	5.512
0371BTF	37/64	.5781	37/64	2.953	5.512
0381BTF	19/32	.5937	5/8	3.051	5.709
0391BTF	39/64	.6094	5/8	3.051	5.709
0401BTF	5/8	.6250	5/8	3.150	5.709

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS

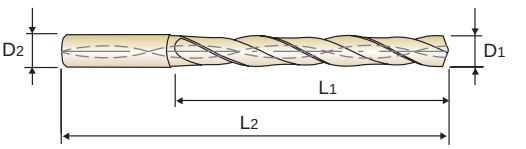
DH418 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES — LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ⌀D1: See page 247, Shank Tolerance ⌀D2: -.0001 -.0005



MG | h6 | 140° P.59

5 × D

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
0131CTF	13/64	.2031	15/64	1-3/4	3-15/16
0141CTF	7/32	.2188	15/64	1-57/64	3-15/16
0151CTF	15/64	.2344	15/64	1-57/64	3-15/16
0161CTF	1/4	.2500	17/64	2-3/64	4-19/64
2061CTF	F	.2570	17/64	2-13/64	4-19/64
0171CTF	17/64	.2656	17/64	2-13/64	4-19/64
2091CTF	I	.2720	.2720	2-13/64	4-19/64
0181CTF	9/32	.2812	5/16	2-23/64	4-41/64
0191CTF	19/64	.2969	5/16	2-33/64	4-41/64
0201CTF	5/16	.3125	5/16	2-33/64	4-41/64
0211CTF	21/64	.3281	11/32	2-43/64	5
2171CTF	Q	.3320	11/32	2-43/64	5

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
0221CTF	11/32	.3438	11/32	2-27/32	5
0231CTF	23/64	.3594	25/64	3	5-23/64
2211CTF	U	.3680	25/64	3	5-23/64
0241CTF	3/8	.3750	25/64	3-5/32	5-23/64
0251CTF	25/64	.3906	25/64	3-5/32	5-23/64
0261CTF	13/32	.4062	27/64	3-5/16	5-7/8
0271CTF	27/64	.4219	27/64	3-15/32	5-7/8
0281CTF	7/16	.4375	15/32	3-5/8	6-7/32
0291CTF	29/64	.4531	15/32	3-25/32	6-7/32
0301CTF	15/32	.4688	15/32	3-25/32	6-7/32
0311CTF	31/64	.4844	1/2	3-15/16	6-37/64
0321CTF	1/2	.5000	1/2	4-3/32	6-37/64

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS

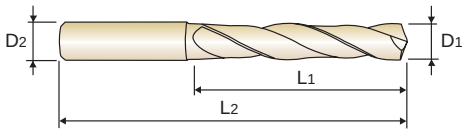
DH404 SERIES

CARBIDE, DREAM DRILLS without COOLANT HOLES

STUB

▶**Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶**Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling



DIN 6539 | MG | h6 | h7 | 140° | P.60

$D_1 = D_2$
$3 \times D$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiAlN	$D_1 = D_2$		L_1	L_2
DH404030	3.0	.1181	16	46
DH404031	3.1	.1220	18	49
DH404032	3.2	.1260	18	49
DH404033	3.3	.1299	18	49
DH404034	3.4	.1339	20	52
DH404035	3.5	.1378	20	52
DH404036	3.6	.1417	20	52
DH404037	3.7	.1457	20	52
DH404038	3.8	.1496	22	55
DH404039	3.9	.1535	22	55
DH404040	4.0	.1575	22	55
DH404041	4.1	.1614	22	55
DH404042	4.2	.1654	22	55
DH404043	4.3	.1693	24	58
DH404044	4.4	.1732	24	58
DH404045	4.5	.1772	24	58
DH404046	4.6	.1811	24	58
DH404047	4.7	.1850	24	58
DH404048	4.8	.1890	26	62
DH404049	4.9	.1929	26	62
DH404050	5.0	.1969	26	62
DH404051	5.1	.2008	26	62
DH404052	5.2	.2047	26	62
DH404053	5.3	.2087	26	62
DH404054	5.4	.2126	28	66
DH404055	5.5	.2165	28	66
DH404056	5.6	.2205	28	66

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiAlN	$D_1 = D_2$		L_1	L_2
DH404057	5.7	.2244	28	66
DH404058	5.8	.2283	28	66
DH404059	5.9	.2323	28	66
DH404060	6.0	.2362	28	66
DH404061	6.1	.2402	31	70
DH404062	6.2	.2441	31	70
DH404063	6.3	.2480	31	70
DH404064	6.4	.2520	31	70
DH404065	6.5	.2559	31	70
DH404066	6.6	.2598	31	70
DH404067	6.7	.2638	31	70
DH404068	6.8	.2677	34	74
DH404069	6.9	.2717	34	74
DH404070	7.0	.2756	34	74
DH404071	7.1	.2795	34	74
DH404072	7.2	.2835	34	74
DH404073	7.3	.2874	34	74
DH404074	7.4	.2913	34	74
DH404075	7.5	.2953	34	74
DH404076	7.6	.2992	37	79
DH404077	7.7	.3031	37	79
DH404078	7.8	.3071	37	79
DH404079	7.9	.3110	37	79
DH404080	8.0	.3150	37	79
DH404081	8.1	.3189	37	79
DH404082	8.2	.3228	37	79
DH404083	8.3	.3268	37	79

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

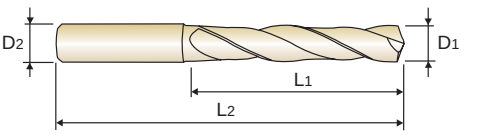
DREAM DRILLS

DH404 SERIES

CARBIDE, DREAM DRILLS without COOLANT HOLES — STUB

▶**Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶**Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling



DIN 6539 | MG | h6 | h7 | 140° | P.60

$D_1 = D_2$
3 × D

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiAlN	$D_1 = D_2$		L_1	L_2
DH404084	8.4	.3307	37	79
DH404085	8.5	.3346	37	79
DH404086	8.6	.3386	40	84
DH404087	8.7	.3425	40	84
DH404088	8.8	.3465	40	84
DH404089	8.9	.3504	40	84
DH404090	9.0	.3543	40	84
DH404091	9.1	.3583	40	84
DH404092	9.2	.3622	40	84
DH404093	9.3	.3661	40	84
DH404094	9.4	.3701	40	84
DH404095	9.5	.3740	40	84
DH404096	9.6	.3780	43	89
DH404097	9.7	.3819	43	89
DH404098	9.8	.3858	43	89
DH404099	9.9	.3898	43	89
DH404100	10.0	.3937	43	89
DH404102	10.2	.4016	43	89
DH404105	10.5	.4134	43	89

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiAlN	$D_1 = D_2$		L_1	L_2
DH404110	11.0	.4331	47	95
DH404115	11.5	.4528	47	95
DH404120	12.0	.4724	51	102
DH404130	13.0	.5118	51	102
DH404135	13.5	.5314	54	107
DH404140	14.0	.5512	54	107
DH404145	14.5	.5708	56	111
DH404150	15.0	.5905	56	111
DH404155	15.5	.6102	58	115
DH404160	16.0	.6299	58	115
DH404165	16.5	.6495	60	119
DH404170	17.0	.6692	60	119
DH404175	17.5	.6889	62	123
DH404180	18.0	.7087	62	123
DH404185	18.5	.7283	64	127
DH404190	19.0	.7480	64	127
DH404195	19.5	.7676	66	131
DH404200	20.0	.7874	66	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS

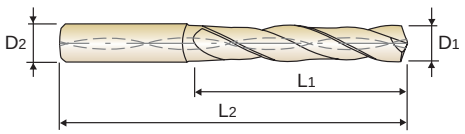
DH406 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES

SHORT

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling



DIN 6537 | MG | h6 | m7 | 140° | P.60

3 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH406030	3.0	.1181	6	20	62
DH406031	3.1	.1220	6	20	62
DH406032	3.2	.1260	6	20	62
DH406033	3.3	.1299	6	20	62
DH406034	3.4	.1339	6	20	62
DH406035	3.5	.1378	6	20	62
DH406036	3.6	.1417	6	20	62
DH406037	3.7	.1457	6	20	62
DH406038	3.8	.1496	6	24	66
DH406039	3.9	.1535	6	24	66
DH406040	4.0	.1575	6	24	66
DH406041	4.1	.1614	6	24	66
DH406042	4.2	.1654	6	24	66
DH406043	4.3	.1693	6	24	66
DH406044	4.4	.1732	6	24	66
DH406045	4.5	.1772	6	24	66
DH406046	4.6	.1811	6	24	66
DH406047	4.7	.1850	6	24	66
DH406048	4.8	.1890	6	28	66
DH406049	4.9	.1929	6	28	66
DH406050	5.0	.1969	6	28	66
DH406051	5.1	.2008	6	28	66
DH406052	5.2	.2047	6	28	66
DH406053	5.3	.2087	6	28	66
DH406054	5.4	.2126	6	28	66
DH406055	5.5	.2165	6	28	66
DH406056	5.6	.2205	6	28	66

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH406057	5.7	.2244	6	28	66
DH406058	5.8	.2283	6	28	66
DH406059	5.9	.2323	6	28	66
DH406060	6.0	.2362	6	28	66
DH406061	6.1	.2402	8	34	79
DH406062	6.2	.2441	8	34	79
DH406063	6.3	.2480	8	34	79
DH406064	6.4	.2520	8	34	79
DH406065	6.5	.2559	8	34	79
DH406066	6.6	.2598	8	34	79
DH406067	6.7	.2638	8	34	79
DH406068	6.8	.2677	8	34	79
DH406069	6.9	.2717	8	34	79
DH406070	7.0	.2756	8	34	79
DH406071	7.1	.2795	8	41	79
DH406072	7.2	.2835	8	41	79
DH406073	7.3	.2874	8	41	79
DH406074	7.4	.2913	8	41	79
DH406075	7.5	.2953	8	41	79
DH406076	7.6	.2992	8	41	79
DH406077	7.7	.3031	8	41	79
DH406078	7.8	.3071	8	41	79
DH406079	7.9	.3110	8	41	79
DH406080	8.0	.3150	8	41	79
DH406081	8.1	.3189	10	47	89
DH406082	8.2	.3228	10	47	89
DH406083	8.3	.3268	10	47	89

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

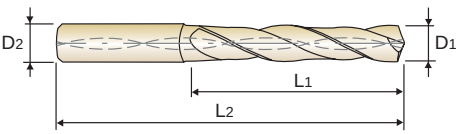
DREAM DRILLS

DH406 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES — SHORT

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling



DIN 6537 | MG | h6 | m7 | 140° | P.60

3 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH406084	8.4	.3307	10	47	89
DH406085	8.5	.3346	10	47	89
DH406086	8.6	.3386	10	47	89
DH406087	8.7	.3425	10	47	89
DH406088	8.8	.3465	10	47	89
DH406089	8.9	.3504	10	47	89
DH406090	9.0	.3543	10	47	89
DH406091	9.1	.3583	10	47	89
DH406092	9.2	.3622	10	47	89
DH406093	9.3	.3661	10	47	89
DH406094	9.4	.3701	10	47	89
DH406095	9.5	.3740	10	47	89
DH406096	9.6	.3780	10	47	89
DH406097	9.7	.3819	10	47	89
DH406098	9.8	.3858	10	47	89
DH406099	9.9	.3898	10	47	89
DH406100	10.0	.3937	10	47	89
DH406101	10.1	.3976	12	55	102
DH406102	10.2	.4016	12	55	102
DH406103	10.3	.4055	12	55	102
DH406104	10.4	.4094	12	55	102
DH406105	10.5	.4134	12	55	102
DH406106	10.6	.4173	12	55	102
DH406107	10.7	.4212	12	55	102
DH406108	10.8	.4252	12	55	102
DH406109	10.9	.4291	12	55	102
DH406110	11.0	.4330	12	55	102

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH406111	11.1	.4370	12	55	102
DH406112	11.2	.4409	12	55	102
DH406113	11.3	.4448	12	55	102
DH406114	11.4	.4488	12	55	102
DH406115	11.5	.4527	12	55	102
DH406116	11.6	.4566	12	55	102
DH406117	11.7	.4606	12	55	102
DH406118	11.8	.4645	12	55	102
DH406119	11.9	.4685	12	55	102
DH406120	12.0	.4724	12	55	102
DH406125	12.5	.4921	14	60	107
DH406130	13.0	.5118	14	60	107
DH406135	13.5	.5314	14	60	107
DH406140	14.0	.5512	14	60	107
DH406145	14.5	.5708	16	65	115
DH406150	15.0	.5905	16	65	115
DH406155	15.5	.6102	16	65	115
DH406160	16.0	.6299	16	65	115
DH406165	16.5	.6495	18	73	123
DH406170	17.0	.6692	18	73	123
DH406175	17.5	.6889	18	73	123
DH406180	18.0	.7087	18	73	123
DH406185	18.5	.7283	20	79	131
DH406190	19.0	.7480	20	79	131
DH406195	19.5	.7676	20	79	131
DH406200	20.0	.7874	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

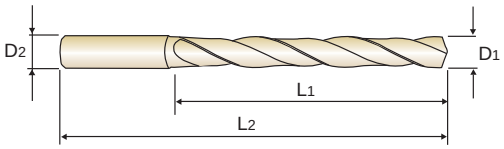
DREAM DRILLS

DH424 SERIES

CARBIDE, DREAM DRILLS without COOLANT HOLES — LONG

▶**Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶**Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling



DIN 6537 | MG | h6 | m7 | 140° | P.60

5 × D

Unit : mm

EDP No.	Diameter Metric	Diameter Inch	Shank Diameter	Flute Length	Overall Length
TiAlN	D1		D2	L1	L2
DH424010	1.0	.0394	3	8	55
DH424011	1.1	.0433	3	12	55
DH424012	1.2	.0472	3	12	55
DH424013	1.3	.0512	3	12	55
DH424014	1.4	.0551	3	12	55
DH424015	1.5	.0591	3	16	55
DH424016	1.6	.0630	3	16	55
DH424017	1.7	.0669	3	16	55
DH424018	1.8	.0709	3	16	55
DH424019	1.9	.0748	3	16	55

EDP No.	Diameter Metric	Diameter Inch	Shank Diameter	Flute Length	Overall Length
TiAlN	D1		D2	L1	L2
DH424020	2.0	.0787	4	21	57
DH424021	2.1	.0827	4	21	57
DH424022	2.2	.0866	4	21	57
DH424023	2.3	.0906	4	21	57
DH424024	2.4	.0945	4	21	57
DH424025	2.5	.0984	4	21	57
DH424026	2.6	.1024	4	21	57
DH424027	2.7	.1063	4	21	57
DH424028	2.8	.1102	4	21	57
DH424029	2.9	.1142	4	21	57

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

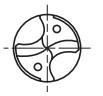
DREAM DRILLS

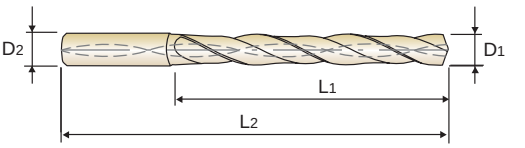
DH408 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES — LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling





DIN 6537 | MG | h6 | m7 | 140° | P.60

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH408010	1.0	.0394	3	8	55
DH408011	1.1	.0433	3	12	55
DH408012	1.2	.0472	3	12	55
DH408013	1.3	.0512	3	12	55
DH408014	1.4	.0551	3	12	55
DH408015	1.5	.0591	3	16	55
DH408016	1.6	.0630	3	16	55
DH408017	1.7	.0669	3	16	55
DH408018	1.8	.0709	3	16	55
DH408019	1.9	.0748	3	16	55
DH408020	2.0	.0787	4	21	57
DH408021	2.1	.0827	4	21	57
DH408022	2.2	.0866	4	21	57
DH408023	2.3	.0906	4	21	57
DH408024	2.4	.0945	4	21	57
DH408025	2.5	.0984	4	21	57
DH408026	2.6	.1024	4	21	57
DH408027	2.7	.1063	4	21	57
DH408028	2.8	.1102	4	21	57
DH408029	2.9	.1142	4	21	57
DH408030	3.0	.1181	6	28	66
DH408031	3.1	.1220	6	28	66
DH408032	3.2	.1260	6	28	66

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH408033	3.3	.1299	6	28	66
DH408034	3.4	.1339	6	28	66
DH408035	3.5	.1378	6	28	66
DH408036	3.6	.1417	6	28	66
DH408037	3.7	.1457	6	28	66
DH408038	3.8	.1496	6	36	74
DH408039	3.9	.1535	6	36	74
DH408040	4.0	.1575	6	36	74
DH408041	4.1	.1614	6	36	74
DH408042	4.2	.1654	6	36	74
DH408043	4.3	.1693	6	36	74
DH408044	4.4	.1732	6	36	74
DH408045	4.5	.1772	6	36	74
DH408046	4.6	.1811	6	36	74
DH408047	4.7	.1850	6	36	74
DH408048	4.8	.1890	6	44	82
DH408049	4.9	.1929	6	44	82
DH408050	5.0	.1969	6	44	82
DH408051	5.1	.2008	6	44	82
DH408052	5.2	.2047	6	44	82
DH408053	5.3	.2087	6	44	82
DH408054	5.4	.2126	6	44	82
DH408055	5.5	.2165	6	44	82

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

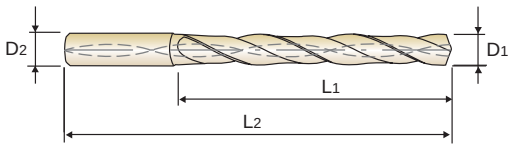
DREAM DRILLS

DH408 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES — LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling



DIN 6537 | MG | h6 | m7 | 140° | P.60

5 × D

Unit : mm

EDP No.	Diameter Metric	Diameter Inch	Shank Diameter	Flute Length	Overall Length
TiAlN	D1		D2	L1	L2
DH408056	5.6	.2205	6	44	82
DH408057	5.7	.2244	6	44	82
DH408058	5.8	.2283	6	44	82
DH408059	5.9	.2323	6	44	82
DH408060	6.0	.2362	6	44	82
DH408061	6.1	.2402	8	53	91
DH408062	6.2	.2441	8	53	91
DH408063	6.3	.2480	8	53	91
DH408064	6.4	.2520	8	53	91
DH408065	6.5	.2559	8	53	91
DH408066	6.6	.2598	8	53	91
DH408067	6.7	.2638	8	53	91
DH408068	6.8	.2677	8	53	91
DH408069	6.9	.2717	8	53	91
DH408070	7.0	.2756	8	53	91
DH408071	7.1	.2795	8	53	91
DH408072	7.2	.2835	8	53	91
DH408073	7.3	.2874	8	53	91
DH408074	7.4	.2913	8	53	91
DH408075	7.5	.2953	8	53	91
DH408076	7.6	.2992	8	53	91
DH408077	7.7	.3031	8	53	91
DH408078	7.8	.3071	8	53	91

EDP No.	Diameter Metric	Diameter Inch	Shank Diameter	Flute Length	Overall Length
TiAlN	D1		D2	L1	L2
DH408079	7.9	.3110	8	53	91
DH408080	8.0	.3150	8	53	91
DH408081	8.1	.3189	10	61	103
DH408082	8.2	.3228	10	61	103
DH408083	8.3	.3268	10	61	103
DH408084	8.4	.3307	10	61	103
DH408085	8.5	.3346	10	61	103
DH408086	8.6	.3386	10	61	103
DH408087	8.7	.3425	10	61	103
DH408088	8.8	.3465	10	61	103
DH408089	8.9	.3504	10	61	103
DH408090	9.0	.3543	10	61	103
DH408091	9.1	.3583	10	61	103
DH408092	9.2	.3622	10	61	103
DH408093	9.3	.3661	10	61	103
DH408094	9.4	.3701	10	61	103
DH408095	9.5	.3740	10	61	103
DH408096	9.6	.3780	10	61	103
DH408097	9.7	.3819	10	61	103
DH408098	9.8	.3858	10	61	103
DH408099	9.9	.3898	10	61	103
DH408100	10.0	.3937	10	61	103
DH408101	10.1	.3976	12	71	118

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

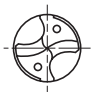
DREAM DRILLS

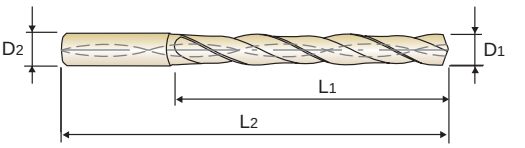
DH408 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES — LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling





DIN 6537 | MG | h6 | m7 | 140° | P.60

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH408102	**10.2**	**.4016**	12	71	118
DH408103	**10.3**	**.4055**	12	71	118
DH408104	**10.4**	**.4094**	12	71	118
DH408105	**10.5**	**.4134**	12	71	118
DH408106	**10.6**	**.4173**	12	71	118
DH408107	**10.7**	**.4212**	12	71	118
DH408108	**10.8**	**.4252**	12	71	118
DH408109	**10.9**	**.4291**	12	71	118
DH408110	**11.0**	**.4330**	12	71	118
DH408111	**11.1**	**.4370**	12	71	118
DH408112	**11.2**	**.4409**	12	71	118
DH408113	**11.3**	**.4448**	12	71	118
DH408114	**11.4**	**.4488**	12	71	118
DH408115	**11.5**	**.4527**	12	71	118
DH408116	**11.6**	**.4566**	12	71	118
DH408117	**11.7**	**.4606**	12	71	118
DH408118	**11.8**	**.4645**	12	71	118
DH408119	**11.9**	**.4685**	12	71	118

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH408120	**12.0**	**.4724**	12	71	118
DH408125	**12.5**	**.4921**	14	77	124
DH408130	**13.0**	**.5118**	14	77	124
DH408135	**13.5**	**.5314**	14	77	124
DH408140	**14.0**	**.5512**	14	77	124
DH408145	**14.5**	**.5708**	16	83	133
DH408150	**15.0**	**.5905**	16	83	133
DH408155	**15.5**	**.6102**	16	83	133
DH408160	**16.0**	**.6299**	16	83	133
DH408165	**16.5**	**.6495**	18	93	143
DH408170	**17.0**	**.6692**	18	93	143
DH408175	**17.5**	**.6889**	18	93	143
DH408180	**18.0**	**.7087**	18	93	143
DH408185	**18.5**	**.7283**	20	101	153
DH408190	**19.0**	**.7480**	20	101	153
DH408195	**19.5**	**.7676**	20	101	153
DH408200	**20.0**	**.7874**	20	101	153

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS

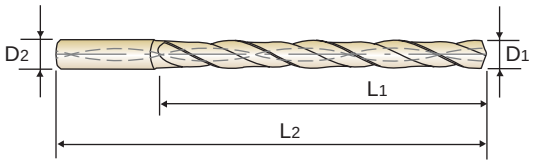
DH421 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES

EXTRA LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling



DIN 6537 | MG | h6 | m7 | 140° | P.60

8 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421030	3.0	.1181	6	34	72
DH421031	3.1	.1220	6	34	72
DH421008F	1/8	.1250	6	34	72
DH421032	3.2	.1260	6	34	72
DH421033	3.3	.1299	6	34	72
DH421034	3.4	.1339	6	34	72
DH421229G	#29	.1360	6	34	72
DH421035	3.5	.1378	6	34	72
DH421009F	9/64	.1406	6	34	72
DH421036	3.6	.1417	6	34	72
DH421037	3.7	.1457	6	34	72
DH421038	3.8	.1496	6	43	81
DH421039	3.9	.1535	6	43	81
DH421010F	5/32	.1536	6	43	81
DH421040	4.0	.1575	6	43	81
DH421221G	#21	.1590	6	43	81
DH421041	4.1	.1614	6	43	81
DH421042	4.2	.1654	6	43	81
DH421043	4.3	.1693	6	43	81
DH421011F	11/64	.1719	6	43	81
DH421044	4.4	.1732	6	43	81
DH421045	4.5	.1772	6	43	81
DH421046	4.6	.1811	6	43	81
DH421047	4.7	.1850	6	43	81
DH421012F	3/16	.1875	6	57	95
DH421048	4.8	.1890	6	57	95
DH421049	4.9	.1929	6	57	95

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421050	5.0	.1969	6	57	95
DH421051	5.1	.2008	6	57	95
DH421013F	13/64	.2031	6	57	95
DH421052	5.2	.2047	6	57	95
DH421053	5.3	.2087	6	57	95
DH421054	5.4	.2126	6	57	95
DH421055	5.5	.2165	6	57	95
DH421014F	7/32	.2188	6	57	95
DH421056	5.6	.2205	6	57	95
DH421057	5.7	.2244	6	57	95
DH421058	5.8	.2283	6	57	95
DH421059	5.9	.2323	6	57	95
DH421015F	15/64	.2344	6	57	95
DH421060	6.0	.2362	6	57	95
DH421061	6.1	.2402	8	76	114
DH421062	6.2	.2441	8	76	114
DH421063	6.3	.2480	8	76	114
DH421016F	1/4	.2500	8	76	114
DH421064	6.4	.2520	8	76	114
DH421065	6.5	.2559	8	76	114
DH421106L	F	.2570	8	76	114
DH421066	6.6	.2598	8	76	114
DH421067	6.7	.2638	8	76	114
DH421017F	17/64	.2656	8	76	114
DH421068	6.8	.2677	8	76	114
DH421069	6.9	.2717	8	76	114
DH421070	7.0	.2756	8	76	114

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS

DH421 SERIES

CARBIDE, DREAM DRILLS with COOLANT HOLES

EXTRA LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

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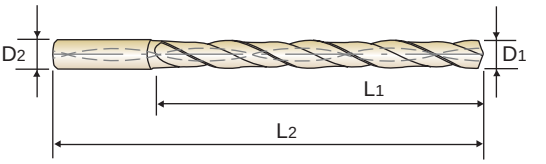

DIN 6537 | MG | h6 | m7 | 140° | P.60

8 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421071	7.1	.2795	8	76	114
DH421072	7.2	.2835	8	76	114
DH421073	7.3	.2874	8	76	114
DH421074	7.4	.2913	8	76	114
DH421075	7.5	.2953	8	76	114
DH421019F	19/64	.2969	8	76	114
DH421076	7.6	.2992	8	76	114
DH421077	7.7	.3031	8	76	114
DH421078	7.8	.3071	8	76	114
DH421079	7.9	.3110	8	76	114
DH421020F	5/16	.3125	8	76	114
DH421080	8.0	.3150	8	76	114
DH421081	8.1	.3189	10	95	142
DH421082	8.2	.3228	10	95	142
DH421083	8.3	.3268	10	95	142
DH421021F	21/64	.3281	10	95	142
DH421084	8.4	.3307	10	95	142
DH421117L	Q	.3320	10	95	142
DH421085	8.5	.3346	10	95	142
DH421086	8.6	.3386	10	95	142
DH421087	8.7	.3425	10	95	142
DH421022F	11/32	.3438	10	95	142
DH421088	8.8	.3465	10	95	142
DH421089	8.9	.3504	10	95	142
DH421090	9.0	.3543	10	95	142
DH421091	9.1	.3583	10	95	142
DH421023F	23/64	.3594	10	95	142

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421092	9.2	.3622	10	95	142
DH421093	9.3	.3661	10	95	142
DH421094	9.4	.3701	10	95	142
DH421095	9.5	.3740	10	95	142
DH421096	9.6	.3780	10	95	142
DH421097	9.7	.3819	10	95	142
DH421098	9.8	.3858	10	95	142
DH421099	9.9	.3898	10	95	142
DH421025F	25/64	.3906	10	95	142
DH421100	10.0	.3937	10	95	142
DH421101	10.1	.3976	12	114	162
DH421102	10.2	.4016	12	114	162
DH421103	10.3	.4055	12	114	162
DH421026F	13/32	.4063	12	114	162
DH421104	10.4	.4094	12	114	162
DH421105	10.5	.4134	12	114	162
DH421106	10.6	.4173	12	114	162
DH421107	10.7	.4212	12	114	162
DH421027F	27/64	.4219	12	114	162
DH421108	10.8	.4252	12	114	162
DH421109	10.9	.4291	12	114	162
DH421110	11.0	.4330	12	114	162
DH421111	11.1	.4370	12	114	162
DH421028F	7/16	.4375	12	114	162
DH421112	11.2	.4409	12	114	162
DH421113	11.3	.4448	12	114	162
DH421114	11.4	.4488	12	114	162

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

CARBIDE, DREAM DRILLS with COOLANT HOLES

EXTRA LONG

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

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Special Design - reaming is not required
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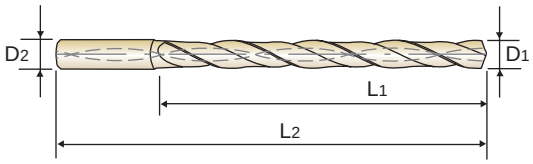


DIN 6537 | MG | h6 | m7 | 140° | P.60

8 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421115	**11.5**	**.4527**	12	114	162
DH421116	**11.6**	**.4566**	12	114	162
DH421117	**11.7**	**.4606**	12	114	162
DH421118	**11.8**	**.4645**	12	114	162
DH421119	**11.9**	**.4685**	12	114	162
DH421030F	**15/32**	**.4688**	12	114	162
DH421120	**12.0**	**.4724**	12	114	162

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D_1		D_2	L_1	L_2
DH421031F	**31/64**	**.4844**	14	133	178
DH421125	**12.5**	**.4921**	14	133	178
DH421032F	**1/2**	**.5000**	14	133	178
DH421130	**13.0**	**.5118**	14	133	178
DH421032F	**33/64**	**.5156**	14	133	178
DH421135	**13.5**	**.5314**	14	133	178
DH421140	**14.0**	**.5512**	14	133	178

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
○	◎	◎			○		○				

DREAM DRILLS RECOMMENDED CUTTING CONDITIONS

CARBIDE, DREAM DRILLS without COOLANT HOLES, TiAlN COATED

DH414 SERIES

WORK MATERIAL	CAST IRON		CAST IRON		CARBON STEELS		ALLOY STEELS	
STRENGTH	< HRc24		> HRc24		< HRc30		HRc30 - 42	
DIAMETER	N	S	N	S	N	S	N	S
1/8 ~ 3/16	13120	.006	8750	.005	7880	.005	7000	.005
3/16 ~ 5/16	8200	.008	5470	.006	4920	.006	4370	.006
5/16 ~ 3/8	5970	.011	3980	.009	3560	.009	3190	.009
3/8 ~ 1/2	4690	.014	3120	.011	2810	.011	2500	.011
1/2 ~ 9/16	3860	.016	2570	.012	2310	.012	2060	.012
9/16 ~ 13/16	2980	.018	1990	.014	1790	.014	1590	.014

▶Recommend to reduce the feed rate as following
Feed 100% : DH414(3 × D)

N = R.P.M
S = Inch per Revolution(inch/rev.)

CARBIDE, DREAM DRILLS with COOLANT HOLES, TiAlN COATED

DH416, DH418 SERIES

WORK MATERIAL	CAST IRON		CAST IRON		CARBON STEELS		ALLOY STEELS	
STRENGTH	< HRc24		> HRc24		< HRc30		HRc30 - 42	
DIAMETER	N	S	N	S	N	S	N	S
1/8 ~ 3/16	14870	.006	9620	.006	8750	.006	7880	.005
3/16 ~ 5/16	8200	.008	6010	.008	5470	.008	4920	.006
5/16 ~ 3/8	6760	.011	4370	.011	3980	.011	3580	.009
3/8 ~ 1/2	5310	.014	3440	.014	3120	.014	2810	.011
1/2 ~ 9/16	4370	.016	2830	.016	2570	.016	2310	.012
9/16 ~ 13/16	3380	.018	2190	.018	1990	.018	1790	.014

▶Recommend to reduce the feed rate as following
Feed 100% : DH416(3 × D)
Feed 85% : DH418(5 × D)

N = R.P.M
S = Inch per Revolution(inch/rev.)

CARBIDE, DREAM DRILLS without COOLANT HOLES, TiAlN COATED

DH404, DH424 SERIES

WORK MATERIAL		NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
STRENGTH		< HRc 20		> HRc 20		< 240 BHN		< 300 BHN	
DIAMETER		N	S	N	S	N	S	N	S
METRIC	INCH								
1.0	.0394	13000	.002	11250	.002	21300	.002	14200	.002
2.0	.0787	13000	.002	11250	.002	21300	.002	14200	.002
3.0	.1181	13000	.005	11000	.005	21000	.005	14000	.005
4.0	.1575	9500	.006	8400	.006	16000	.006	10500	.006
5.0	.1969	7600	.006	6700	.006	13000	.006	8300	.006
6.0	.2362	6400	.007	5600	.007	11000	.007	6900	.007
7.0	.2756	5500	.007	4800	.007	9100	.007	5900	.007
8.0	.3150	4800	.008	4200	.008	8000	.008	5200	.008
9.0	.3543	4200	.009	3700	.009	7100	.009	4600	.009
10.0	.3937	3800	.010	3350	.010	6400	.010	4150	.010
12.0	.4724	3200	.011	2800	.011	5300	.011	3450	.011
14.0	.5512	2750	.011	2400	.011	4550	.011	3000	.011
16.0	.6299	2400	.012	2100	.012	4000	.012	2600	.012
18.0	.7087	2100	.013	1850	.013	3550	.013	2300	.013
20.0	.7874	1900	.014	1650	.014	3200	.014	2100	.014

▶ Recommend to reduce the feed rate as following

Feed 100% : DH404(3 × D)

N = R.P.M

S = Inch per Revolution(inch/rev.)

CARBIDE, DREAM DRILLS with COOLANT HOLES, TiAlN COATED

DH406, DH408, DH421 SERIES

WORK MATERIAL		NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
STRENGTH		< HRc 20		> HRc 20		< 240 BHN		< 300 BHN	
DIAMETER		N	S	N	S	N	S	N	S
METRIC	INCH								
1.0	.0394	16250	.002	14800	.002	26600	.002	17300	.002
2.0	.0787	16250	.003	14800	.003	26600	.003	17300	.003
3.0	.1181	16000	.006	14500	.006	26000	.006	17000	.006
4.0	.1575	12000	.007	11000	.007	20000	.007	13000	.007
5.0	.1969	9550	.007	8600	.007	16000	.007	10000	.007
6.0	.2362	8000	.008	7200	.008	13000	.008	8500	.008
7.0	.2756	6800	.009	6100	.009	11500	.009	7300	.009
8.0	.3150	6000	.009	5400	.009	9900	.009	6400	.009
9.0	.3543	5300	.011	4800	.011	8800	.011	5700	.011
10.0	.3937	4800	.012	4300	.012	8000	.012	5100	.012
12.0	.4724	4000	.013	3600	.013	6600	.013	4250	.013
14.0	.5512	3400	.014	3050	.014	5700	.014	3650	.014
16.0	.6299	3000	.015	2700	.015	5000	.015	3200	.015
18.0	.7087	2650	.017	2400	.017	4400	.017	2850	.017
20.0	.7874	2400	.018	2150	.018	4000	.018	2550	.018

▶Recommend to reduce the feed rate as following

Feed 100% : DH406(3×D), **Feed 85%** : DH408(5×D),
Feed 70% : DH421(8×D)

N = R.P.M
S = Inch per Revolution(inch/rev.)

CARBIDE

Being the best through innovation

DREAM DRILLS -INOX

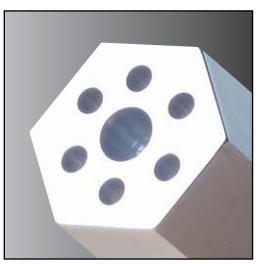
- **WITH COOLANT HOLES**
  Stainless Steels, Nickel Alloys and Titanium up to HRc35.

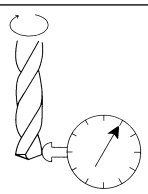
SOLID CARBIDE DREAM DRILLS - INOX (with Coolant Holes)

Stainless Steels, Nickel Alloys and Titanium up to HRc35.

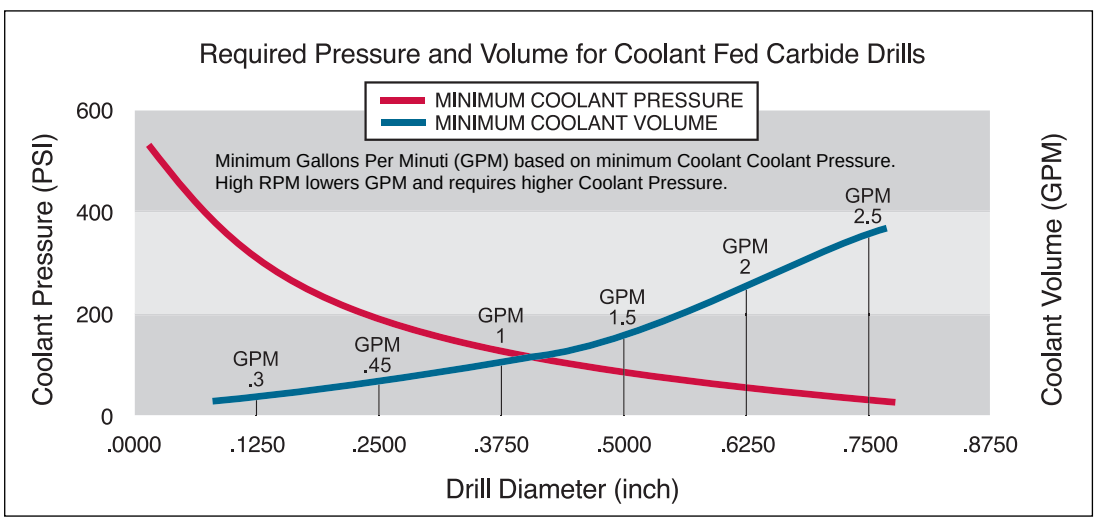
◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		
◎	◎	○				○	◎	○	○		
◎	◎	○				○	◎	○	○		
◎	◎	○				○	◎	○	○		
◎	◎	○				○	◎	○	○		





• Radial run out at cutting lip must not exceed .001



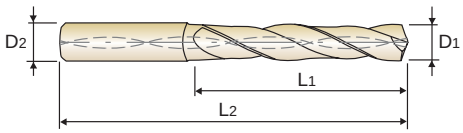
DREAM DRILLS -INOX

DH463 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

SHORT

- ▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
- ▶Excellent chip evacuation due to better surface treatment.
- ▶Point R-thinning makes the superior centering and chip curl.
- ▶TiAlN coating achieves the better surface finishes and longer tool life.
- ▶Tolerance : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005



MG 140° P.72

▶ for stainless steel

3 × D

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH463008	1/8	.1250	15/64	1.102	2.992
DH463011	11/64	.1719	15/64	1.417	3.386
DH463012	3/16	.1875	15/64	1.575	3.543
DH463013	13/64	.2031	15/64	1.082	3.228
DH463014	7/32	.2188	15/64	1.181	3.228
DH463015	15/64	.2344	15/64	1.181	3.228
DH463016	1/4	.2500	17/64	1.279	3.465
DH463206	F	.2570	17/64	1.279	3.465
DH463017	17/64	.2656	17/64	1.378	3.465
DH463209	I	.2720	.2720	1.378	3.465
DH463018	9/32	.2812	5/16	1.476	3.701
DH463019	19/64	.2969	5/16	1.476	3.701
DH463020	5/16	.3125	5/16	1.575	3.701
DH463021	21/64	.3281	11/32	1.673	3.937
DH463217	Q	.3320	11/32	1.673	3.937
DH463022	11/32	.3438	11/32	1.772	3.937
DH463023	23/64	.3594	25/64	1.870	4.174
DH463221	U	.3680	25/64	1.870	4.174

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH463024	3/8	.3750	25/64	1.969	4.174
DH463025	25/64	.3906	25/64	1.969	4.174
DH463026	13/32	.4062	27/64	2.067	4.567
DH463027	27/64	.4219	27/64	2.165	4.567
DH463028	7/16	.4375	15/32	2.264	4.803
DH463029	29/64	.4531	15/32	2.264	4.803
DH463030	15/32	.4688	15/32	2.362	4.803
DH463031	31/64	.4844	1/2	2.461	5.039
DH463032	1/2	.5000	1/2	2.559	5.039
DH463033	33/64	.5156	35/64	2.657	5.276
DH463034	17/32	.5312	35/64	2.756	5.276
DH463035	35/64	.5469	35/64	2.756	5.276
DH463036	9/16	.5625	37/64	2.854	5.512
DH463037	37/64	.5781	37/64	2.953	5.512
DH463038	19/32	.5937	5/8	3.051	5.709
DH463039	39/64	.6094	5/8	3.051	5.709
DH463040	5/8	.6250	5/8	3.150	5.709

▶ Other shank types are available on your request.

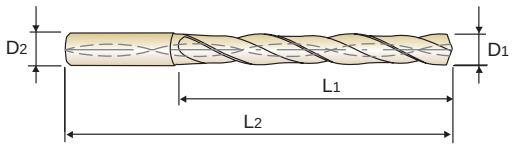
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

LONG

▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
▶Excellent chip evacuation due to better surface treatment.
▶Point R-thinning makes the superior centering and chip curl.
▶TiAlN coating achieves the better surface finishes and longer tool life.
▶Tolerance : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005



MG 140° P.72

▶ for stainless steel

5 × D

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH464013	**13/64**	**.2031**	15/64	1-3/4	3-15/16
DH464014	**7/32**	**.2188**	15/64	1-57/64	3-15/16
DH464015	**15/64**	**.2344**	15/64	1-57/64	3-15/16
DH464016	**1/4**	**.2500**	17/64	2-3/64	4-19/64
DH464206	**F**	**.2570**	17/64	2-13/64	4-19/64
DH464017	**17/64**	**.2656**	17/64	2-13/64	4-19/64
DH464209	**I**	**.2720**	.2720	2-13/64	4-19/64
DH464018	**9/32**	**.2812**	5/16	2-23/64	4-41/64
DH464019	**19/64**	**.2969**	5/16	2-33/64	4-41/64
DH464020	**5/16**	**.3125**	5/16	2-33/64	4-41/64
DH464021	**21/64**	**.3281**	11/32	2-43/64	5
DH464217	**Q**	**.3320**	11/32	2-43/64	5

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH464022	**11/32**	**.3438**	11/32	2-27/32	5
DH464023	**23/64**	**.3594**	25/64	3	5-23/64
DH464221	**U**	**.3680**	25/64	3	5-23/64
DH464024	**3/8**	**.3750**	25/64	3-5/32	5-23/64
DH464025	**25/64**	**.3906**	25/64	3-5/32	5-23/64
DH464026	**13/32**	**.4062**	27/64	3-5/16	5-7/8
DH464027	**27/64**	**.4219**	27/64	3-15/32	5-7/8
DH464028	**7/16**	**.4375**	15/32	3-5/8	6-7/32
DH464029	**29/64**	**.4531**	15/32	3-25/32	6-7/32
DH464030	**15/32**	**.4688**	15/32	3-25/32	6-7/32
DH464031	**31/64**	**.4844**	1/2	3-15/16	6-37/64
DH464032	**1/2**	**.5000**	1/2	4-3/32	6-37/64

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

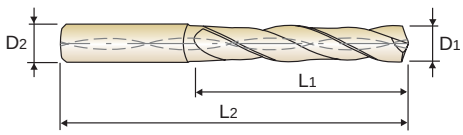
DREAM DRILLS -INOX

DH451 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

SHORT

- ▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
- ▶Excellent chip evacuation due to better surface treatment.
- ▶Point R-thinning makes the superior centering and chip curl.
- ▶TiAlN coating achieves the better surface finishes and longer tool life.
- ▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6



DIN 6537 | MG | h6 | m7 | 140° P.72

▶ for stainless steel

3 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH451030	3.0	.1181	6	20	62
DH451031	3.1	.1220	6	20	62
DH451032	3.2	.1260	6	20	62
DH451033	3.3	.1299	6	20	62
DH451034	3.4	.1339	6	20	62
DH451035	3.5	.1378	6	20	62
DH451036	3.6	.1417	6	20	62
DH451037	3.7	.1457	6	20	62
DH451038	3.8	.1496	6	24	66
DH451039	3.9	.1535	6	24	66
DH451040	4.0	.1575	6	24	66
DH451041	4.1	.1614	6	24	66
DH451042	4.2	.1654	6	24	66
DH451043	4.3	.1693	6	24	66
DH451044	4.4	.1732	6	24	66
DH451045	4.5	.1772	6	24	66
DH451046	4.6	.1811	6	24	66
DH451047	4.7	.1850	6	24	66
DH451048	4.8	.1890	6	28	66
DH451049	4.9	.1929	6	28	66
DH451050	5.0	.1969	6	28	66
DH451051	5.1	.2008	6	28	66
DH451052	5.2	.2047	6	28	66
DH451053	5.3	.2087	6	28	66
DH451054	5.4	.2126	6	28	66
DH451055	5.5	.2165	6	28	66
DH451056	5.6	.2205	6	28	66

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH451057	5.7	.2244	6	28	66
DH451058	5.8	.2283	6	28	66
DH451059	5.9	.2323	6	28	66
DH451060	6.0	.2362	6	28	66
DH451061	6.1	.2402	8	34	79
DH451062	6.2	.2441	8	34	79
DH451063	6.3	.2480	8	34	79
DH451064	6.4	.2520	8	34	79
DH451065	6.5	.2559	8	34	79
DH451066	6.6	.2598	8	34	79
DH451067	6.7	.2638	8	34	79
DH451068	6.8	.2677	8	34	79
DH451069	6.9	.2717	8	34	79
DH451070	7.0	.2756	8	34	79
DH451071	7.1	.2795	8	41	79
DH451072	7.2	.2835	8	41	79
DH451073	7.3	.2874	8	41	79
DH451074	7.4	.2913	8	41	79
DH451075	7.5	.2953	8	41	79
DH451076	7.6	.2992	8	41	79
DH451077	7.7	.3031	8	41	79
DH451078	7.8	.3071	8	41	79
DH451079	7.9	.3110	8	41	79
DH451080	8.0	.3150	8	41	79
DH451081	8.1	.3189	10	47	89
DH451082	8.2	.3228	10	47	89
DH451083	8.3	.3268	10	47	89

▶ Other shank types are available on your request.

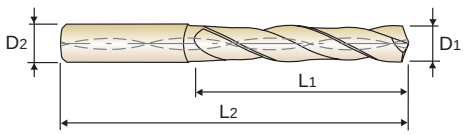
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

SHORT

▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
▶Excellent chip evacuation due to better surface treatment.
▶Point R-thinning makes the superior centering and chip curl.
▶TiAlN coating achieves the better surface finishes and longer tool life.
▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6



DIN 6537 | MG | h6 | m7 | 140° | P.72

▶ for stainless steel

3 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH451084	8.4	.3307	10	47	89
DH451085	8.5	.3346	10	47	89
DH451086	8.6	.3386	10	47	89
DH451087	8.7	.3425	10	47	89
DH451088	8.8	.3465	10	47	89
DH451089	8.9	.3504	10	47	89
DH451090	9.0	.3543	10	47	89
DH451091	9.1	.3583	10	47	89
DH451092	9.2	.3622	10	47	89
DH451093	9.3	.3661	10	47	89
DH451094	9.4	.3701	10	47	89
DH451095	9.5	.3740	10	47	89
DH451096	9.6	.3780	10	47	89
DH451097	9.7	.3819	10	47	89
DH451098	9.8	.3858	10	47	89
DH451099	9.9	.3898	10	47	89
DH451100	10.0	.3937	10	47	89
DH451101	10.1	.3976	12	55	102
DH451102	10.2	.4016	12	55	102
DH451103	10.3	.4055	12	55	102
DH451104	10.4	.4094	12	55	102
DH451105	10.5	.4134	12	55	102
DH451106	10.6	.4173	12	55	102
DH451107	10.7	.4212	12	55	102
DH451108	10.8	.4252	12	55	102
DH451109	10.9	.4291	12	55	102
DH451110	11.0	.4330	12	55	102

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH451111	11.1	.4370	12	55	102
DH451112	11.2	.4409	12	55	102
DH451113	11.3	.4448	12	55	102
DH451114	11.4	.4488	12	55	102
DH451115	11.5	.4527	12	55	102
DH451116	11.6	.4566	12	55	102
DH451117	11.7	.4606	12	55	102
DH451118	11.8	.4645	12	55	102
DH451119	11.9	.4685	12	55	102
DH451120	12.0	.4724	12	55	102
DH451125	12.5	.4921	14	60	107
DH451130	13.0	.5118	14	60	107
DH451135	13.5	.5314	14	60	107
DH451140	14.0	.5512	14	60	107
DH451145	14.5	.5708	16	65	115
DH451150	15.0	.5905	16	65	115
DH451155	15.5	.6102	16	65	115
DH451160	16.0	.6299	16	65	115
DH451165	16.5	.6495	18	73	123
DH451170	17.0	.6692	18	73	123
DH451175	17.5	.6889	18	73	123
DH451180	18.0	.7087	18	73	123
DH451185	18.5	.7283	20	79	131
DH451190	19.0	.7480	20	79	131
DH451195	19.5	.7676	20	79	131
DH451200	20.0	.7874	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

DREAM DRILLS -INOX

DH452 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

LONG

▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
▶Excellent chip evacuation due to better surface treatment.
▶Point R-thinning makes the superior centering and chip curl.
▶TiAlN coating achieves the better surface finishes and longer tool life.
▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6

DIN 6537 | MG | h6 | m7 | 140° P.72

▶ for stainless steel

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH452030	3.0	.1181	6	28	66
DH452031	3.1	.1220	6	28	66
DH452032	3.2	.1260	6	28	66
DH452033	3.3	.1299	6	28	66
DH452034	3.4	.1339	6	28	66
DH452035	3.5	.1378	6	28	66
DH452036	3.6	.1417	6	28	66
DH452037	3.7	.1457	6	28	66
DH452038	3.8	.1496	6	36	74
DH452039	3.9	.1535	6	36	74
DH452040	4.0	.1575	6	36	74
DH452041	4.1	.1614	6	36	74
DH452042	4.2	.1654	6	36	74
DH452043	4.3	.1693	6	36	74
DH452044	4.4	.1732	6	36	74
DH452045	4.5	.1772	6	36	74
DH452046	4.6	.1811	6	36	74
DH452047	4.7	.1850	6	36	74
DH452048	4.8	.1890	6	44	82
DH452049	4.9	.1929	6	44	82
DH452050	5.0	.1969	6	44	82
DH452051	5.1	.2008	6	44	82
DH452052	5.2	.2047	6	44	82
DH452053	5.3	.2087	6	44	82
DH452054	5.4	.2126	6	44	82
DH452055	5.5	.2165	6	44	82
DH452056	5.6	.2205	6	44	82

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH452057	5.7	.2244	6	44	82
DH452058	5.8	.2283	6	44	82
DH452059	5.9	.2323	6	44	82
DH452060	6.0	.2362	6	44	82
DH452061	6.1	.2402	8	53	91
DH452062	6.2	.2441	8	53	91
DH452063	6.3	.2480	8	53	91
DH452064	6.4	.2520	8	53	91
DH452065	6.5	.2559	8	53	91
DH452066	6.6	.2598	8	53	91
DH452067	6.7	.2638	8	53	91
DH452068	6.8	.2677	8	53	91
DH452069	6.9	.2717	8	53	91
DH452070	7.0	.2756	8	53	91
DH452071	7.1	.2795	8	53	91
DH452072	7.2	.2835	8	53	91
DH452073	7.3	.2874	8	53	91
DH452074	7.4	.2913	8	53	91
DH452075	7.5	.2953	8	53	91
DH452076	7.6	.2992	8	53	91
DH452077	7.7	.3031	8	53	91
DH452078	7.8	.3071	8	53	91
DH452079	7.9	.3110	8	53	91
DH452080	8.0	.3150	8	53	91
DH452081	8.1	.3189	10	61	103
DH452082	8.2	.3228	10	61	103
DH452083	8.3	.3268	10	61	103

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

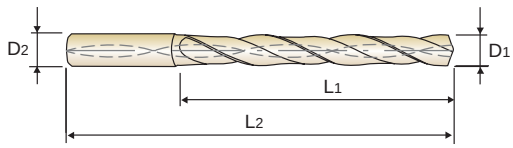
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

DREAM DRILLS -INOX

DH452 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES — LONG

▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
▶Excellent chip evacuation due to better surface treatment.
▶Point R-thinning makes the superior centering and chip curl.
▶TiAlN coating achieves the better surface finishes and longer tool life.
▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6



DIN 6537 | MG | h6 | m7 | 140° P.72

▶ for stainless steel

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH452084	8.4	.3307	10	61	103
DH452085	8.5	.3346	10	61	103
DH452086	8.6	.3386	10	61	103
DH452087	8.7	.3425	10	61	103
DH452088	8.8	.3465	10	61	103
DH452089	8.9	.3504	10	61	103
DH452090	9.0	.3543	10	61	103
DH452091	9.1	.3583	10	61	103
DH452092	9.2	.3622	10	61	103
DH452093	9.3	.3661	10	61	103
DH452094	9.4	.3701	10	61	103
DH452095	9.5	.3740	10	61	103
DH452096	9.6	.3780	10	61	103
DH452097	9.7	.3819	10	61	103
DH452098	9.8	.3858	10	61	103
DH452099	9.9	.3898	10	61	103
DH452100	10.0	.3937	10	61	103
DH452101	10.1	.3976	12	71	118
DH452102	10.2	.4016	12	71	118
DH452103	10.3	.4055	12	71	118
DH452104	10.4	.4094	12	71	118
DH452105	10.5	.4134	12	71	118
DH452106	10.6	.4173	12	71	118
DH452107	10.7	.4212	12	71	118
DH452108	10.8	.4252	12	71	118
DH452109	10.9	.4291	12	71	118
DH452110	11.0	.4330	12	71	118

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH452111	11.1	.4370	12	71	118
DH452112	11.2	.4409	12	71	118
DH452113	11.3	.4448	12	71	118
DH452114	11.4	.4488	12	71	118
DH452115	11.5	.4527	12	71	118
DH452116	11.6	.4566	12	71	118
DH452117	11.7	.4606	12	71	118
DH452118	11.8	.4645	12	71	118
DH452119	11.9	.4685	12	71	118
DH452120	12.0	.4724	12	71	118
DH452125	12.5	.4921	14	77	124
DH452130	13.0	.5118	14	77	124
DH452135	13.5	.5314	14	77	124
DH452140	14.0	.5512	14	77	124
DH452145	14.5	.5708	16	83	133
DH452150	15.0	.5905	16	83	133
DH452155	15.5	.6102	16	83	133
DH452160	16.0	.6299	16	83	133
DH452165	16.5	.6495	18	93	143
DH452170	17.0	.6692	18	93	143
DH452175	17.5	.6889	18	93	143
DH452180	18.0	.7087	18	93	143
DH452185	18.5	.7283	20	101	153
DH452190	19.0	.7480	20	101	153
DH452195	19.5	.7676	20	101	153
DH452200	20.0	.7874	20	101	153

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

DREAM DRILLS -INOX

DH453 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

EXTRA LONG

- ▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
- ▶Excellent chip evacuation due to better surface treatment.
- ▶Point R-thinning makes the superior centering and chip curl.
- ▶TiAlN coating achieves the better surface finishes and longer tool life.
- ▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6

DIN 6537 | MG | h6 | m7 | 140° | P.72

▶ **for stainless steel**

8 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH453030	3.0	.1181	6	34	72
DH453031	3.1	.1220	6	34	72
DH453008F	1/8	.1250	6	34	72
DH453032	3.2	.1260	6	34	72
DH453033	3.3	.1299	6	34	72
DH453034	3.4	.1339	6	34	72
DH453229G	#29	.1360	6	34	72
DH453035	3.5	.1378	6	34	72
DH453009F	9/64	.1406	6	34	72
DH453036	3.6	.1417	6	34	72
DH453037	3.7	.1457	6	34	72
DH453038	3.8	.1496	6	43	81
DH453039	3.9	.1535	6	43	81
DH453010F	5/32	.1563	6	43	81
DH453040	4.0	.1575	6	43	81
DH453221G	#21	.1590	6	43	81
DH453041	4.1	.1614	6	43	81
DH453042	4.2	.1654	6	43	81
DH453043	4.3	.1693	6	43	81
DH453011F	11/64	.1719	6	43	81
DH453044	4.4	.1732	6	43	81
DH453045	4.5	.1772	6	43	81
DH453046	4.6	.1811	6	43	81
DH453047	4.7	.1850	6	43	81
DH453012F	3/16	.1875	6	57	95
DH453048	4.8	.1890	6	57	95
DH453049	4.9	.1929	6	57	95
DH453050	5.0	.1969	6	57	95
DH453051	5.1	.2008	6	57	95
DH453013F	13/64	.2031	6	57	95
DH453052	5.2	.2047	6	57	95

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH453053	5.3	.2087	6	57	95
DH453054	5.4	.2126	6	57	95
DH453055	5.5	.2165	6	57	95
DH453014F	7/32	.2188	6	57	95
DH453056	5.6	.2205	6	57	95
DH453057	5.7	.2244	6	57	95
DH453058	5.8	.2283	6	57	95
DH453059	5.9	.2323	6	57	95
DH453015F	15/64	.2344	6	57	95
DH453060	6.0	.2362	6	57	95
DH453061	6.1	.2402	8	76	114
DH453062	6.2	.2441	8	76	114
DH453063	6.3	.2480	8	76	114
DH453016F	1/4	.2500	8	76	114
DH453064	6.4	.2520	8	76	114
DH453065	6.5	.2559	8	76	114
DH453106L	F	.2570	8	76	114
DH453066	6.6	.2598	8	76	114
DH453067	6.7	.2638	8	76	114
DH453017F	17/64	.2566	8	76	114
DH453068	6.8	.2677	8	76	114
DH453069	6.9	.2717	8	76	114
DH453070	7.0	.2756	8	76	114
DH453071	7.1	.2795	8	76	114
DH453018F	9/32	.2813	8	76	114
DH453072	7.2	.2835	8	76	114
DH453073	7.3	.2874	8	76	114
DH453074	7.4	.2913	8	76	114
DH453075	7.5	.2953	8	76	114
DH453019F	19/64	.2969	8	76	114
DH453076	7.6	.2992	8	76	114

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

DREAM DRILLS -INOX

DH453 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

EXTRA LONG

▶The tool has the special flute shape and geometry for suitable machining of stainless steel.
▶Excellent chip evacuation due to better surface treatment.
▶Point R-thinning makes the superior centering and chip curl.
▶TiAlN coating achieves the better surface finishes and longer tool life.
▶Tolerance : Dia. Tolerance ∅D1:m7, Shank Tolerance ∅D2: h6

DIN 6537 | MG | h6 | m7 | 140° | P.72

▶ for stainless steel

8 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH453077	7.7	.3031	8	76	114
DH453078	7.8	.3071	8	76	114
DH453079	7.9	.3110	8	76	114
DH453020F	5/16	.3125	8	76	114
DH453080	8.0	.3150	8	76	114
DH453081	8.1	.3189	10	95	142
DH453082	8.2	.3228	10	95	142
DH453083	8.3	.3268	10	95	142
DH453021F	21/64	.3281	10	95	142
DH453084	8.4	.3307	10	95	142
DH453117L	Q	.3320	10	95	142
DH453085	8.5	.3346	10	95	142
DH453086	8.6	.3386	10	95	142
DH453087	8.7	.3425	10	95	142
DH453022F	11/32	.3438	10	95	142
DH453088	8.8	.3465	10	95	142
DH453089	8.9	.3504	10	95	142
DH453090	9.0	.3543	10	95	142
DH453091	9.1	.3583	10	95	142
DH453023F	23/64	.3594	10	95	142
DH453092	9.2	.3622	10	95	142
DH453093	9.3	.3661	10	95	142
DH453121L	U	.3680	10	95	142
DH453094	9.4	.3701	10	95	142
DH453095	9.5	.3740	10	95	142
DH453024F	3/8	.3750	10	95	142
DH453096	9.6	.3780	10	95	142
DH453097	9.7	.3819	10	95	142
DH453098	9.8	.3858	10	95	142
DH453099	9.9	.3898	10	95	142
DH453025F	25/64	.3906	10	95	142

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH453100	10.0	.3937	10	95	142
DH453101	10.1	.3976	12	114	162
DH453102	10.2	.4016	12	114	162
DH453103	10.3	.4055	12	114	162
DH453026F	13/32	.4063	12	114	162
DH453104	10.4	.4094	12	114	162
DH453105	10.5	.4134	12	114	162
DH453106	10.6	.4173	12	114	162
DH453107	10.7	.4212	12	114	162
DH453027F	27/64	.4219	12	114	162
DH453108	10.8	.4252	12	114	162
DH453109	10.9	.4291	12	114	162
DH453110	11.0	.4330	12	114	162
DH453111	11.1	.4370	12	114	162
DH453028F	7/16	.4375	12	114	162
DH453112	11.2	.4409	12	114	162
DH453113	11.3	.4448	12	114	162
DH453114	11.4	.4488	12	114	162
DH453115	11.5	.4527	12	114	162
DH453116	11.6	.4566	12	114	162
DH453117	11.7	.4606	12	114	162
DH453118	11.8	.4645	12	114	162
DH453119	11.9	.4685	12	114	162
DH453030F	15/32	.4688	12	114	162
DH453120	12.0	.4724	12	114	162
DH453031F	31/64	.4844	14	133	178
DH453125	12.5	.4921	14	133	178
DH453032F	1/2	.5000	14	133	178
DH453130	13.0	.5118	14	133	178
DH453033F	33/64	.5156	14	133	178
DH453135	13.5	.5314	14	133	178
DH453140	14.0	.5512	14	133	178

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○				○	◎	○	○		

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES, TiAlN COATED

DH463, DH464, DH451, DH452, DH453 SERIES

WORK MATERIAL			STAINLESS STEELS 400Series		STAINLESS STEELS 300Series		ALUMINUM		ALUMINUM	
STRENGTH			< 800 N/mm²		> 800 N/mm²		< 10% Si		> 10% Si	
DIAMETER			N	S	N	S	N	S	N	S
Metric(mm)	Fractional	Decimal								
3.0	1/8	.1181	7400	.002	4700	.001	23000	.005	18500	.004
4.0	5/32	.1575	5600	.002	3600	.001	17500	.007	13900	.006
5.0	13/64	.1969	4400	.002	2800	.001	14000	.008	11000	.007
6.0	15/64	.2362	3700	.002	2400	.002	11700	.010	9300	.010
8.0	5/16	.3150	2800	.003	1800	.002	8800	.012	7000	.012
10.0	25/64	.3937	2200	.004	1400	.003	7000	.016	5600	.014
12.0	15/32	.4724	1900	.005	1200	.004	5800	.020	4600	.016
14.0	35/64	.5512	1600	.006	1000	.005	5000	.024	4000	.020
16.0	5/8	.6299	1400	.008	900	.006	4380	.031	3500	.024
18.0	45/64	.7087	1250	.009	800	.007	3900	.039	3100	.028
20.0	25/32	.7874	1120	.009	720	.007	3500	.047	2800	.031

WORK MATERIAL			TITANIUM Ti ALLOY		CARBON STEEL ALLOY STEEL		NON FRERROUS	
STRENGTH								
DIAMETER			N	S	N	S	N	S
Metric(mm)	Fractional	Decimal						
3.0	1/8	.1181	5300	.001	13000	.002	16000	.003
4.0	5/32	.1575	4000	.002	10000	.002	11900	.004
5.0	13/64	.1969	3200	.002	8000	.002	9500	.005
6.0	15/64	.2362	2650	.002	6600	.002	8000	.006
8.0	5/16	.3150	2000	.003	5000	.003	6000	.007
10.0	25/64	.3937	1600	.003	4000	.004	4800	.009
12.0	15/32	.4724	1300	.004	3300	.005	4000	.010
14.0	35/64	.5512	1100	.005	2800	.006	3400	.012
16.0	5/8	.6299	1000	.006	2500	.008	3000	.016
18.0	45/64	.7087	900	.006	2200	.009	2650	.018
20.0	25/32	.7874	800	.007	2000	.009	2400	.020

▶Recommend to reduce the feed rate as following

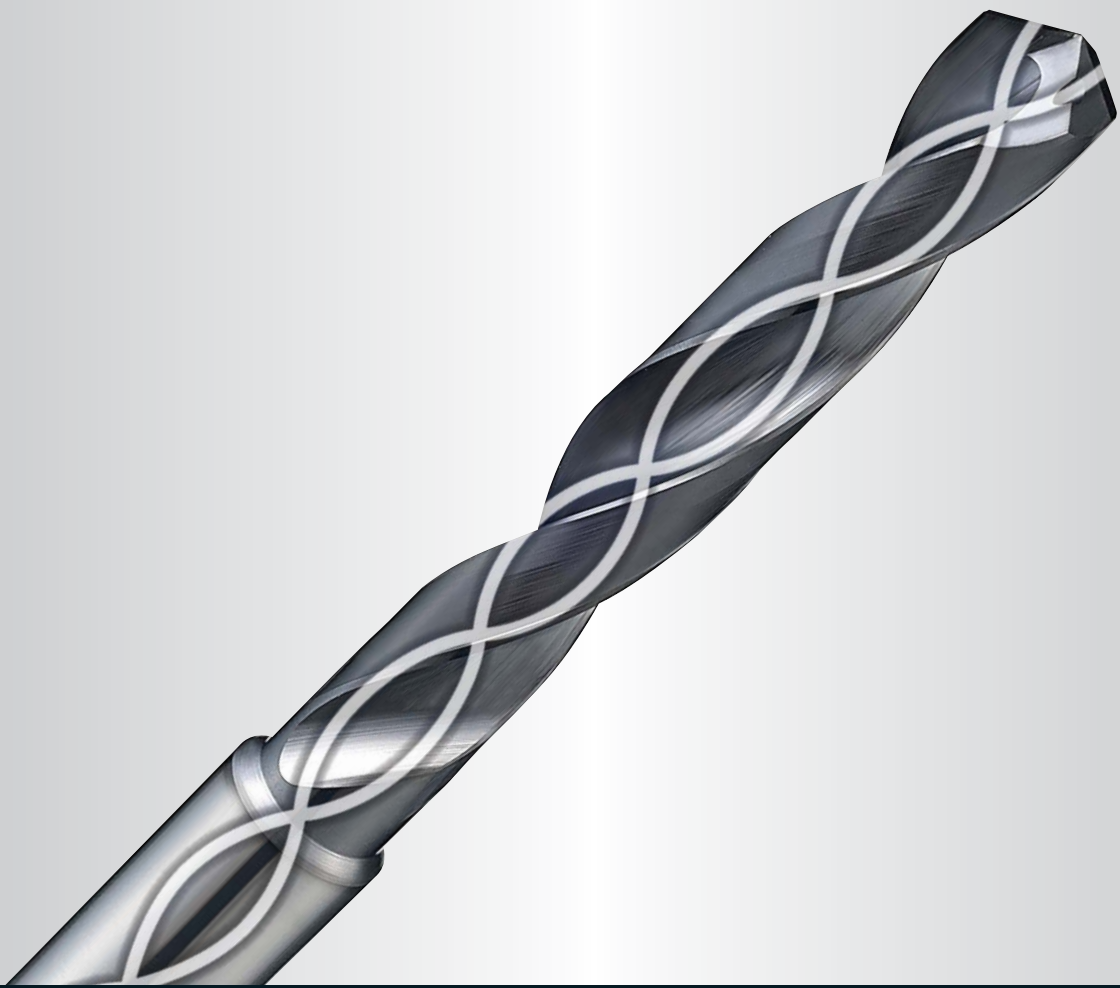
Feed 100% : DH463(3×D), DH464(5×D)
DH451(3×D), DH452(5×D)

Feed 85% : DH453(8×D)

N = R.P.M
S = Inch per Revolution(inch/rev.)

CARBIDE

Being the best through innovation



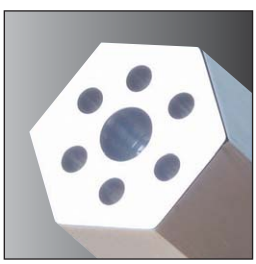
DREAM DRILLS -ALU

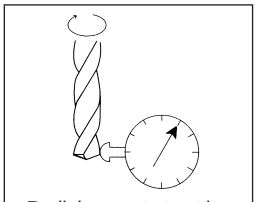
- WITH COOLANT HOLES
for Aluminum & Aluminum Alloys

SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)

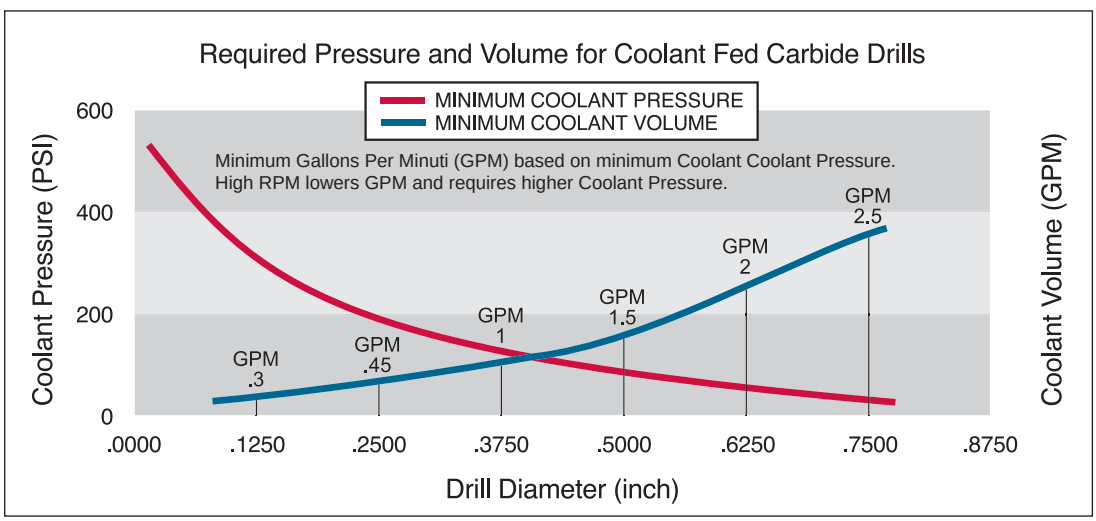
◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
						◎					
						◎					





• Radial run out at cutting lip must not exceed .001

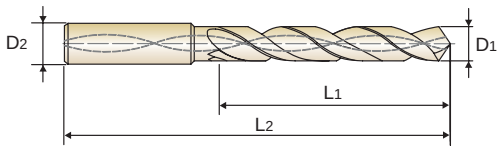


DREAM DRILLS -ALU

DGE466 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES — LONG

▶Wider and deeper flute gullets for maximum chip removal
▶Special geometry and smooth coating reduces built up edge and improves finishes



MG | h6 | 118° | P.79

5 × D

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
DLC	D1		D2	L1	L2
DGE466013	13/64	.2031	15/64	1-3/4	3-15/16
DGE466014	7/32	.2188	15/64	1-57/64	3-15/16
DGE466015	15/64	.2344	15/64	1-57/64	3-15/16
DGE466016	1/4	.2500	17/64	2-3/64	4-19/64
DGE466206	F	.2570	17/64	2-13/64	4-19/64
DGE466017	17/64	.2656	17/64	2-13/64	4-19/64
DGE466209	I	.2720	0.272	2-13/64	4-19/64
DGE466018	9/32	.2812	5/16	2-23/64	4-41/64
DGE466019	19/64	.2969	5/16	2-33/64	4-41/64
DGE466020	5/16	.3125	5/16	2-33/64	4-41/64
DGE466021	21/64	.3281	11/32	2-43/64	5
DGE466217	Q	.3320	11/32	2-43/64	5
DGE466022	11/32	.3438	11/32	2-27/32	5
DGE466023	23/64	.3594	25/64	3	5-23/64
DGE466221	U	.3680	25/64	3	5-23/64
DGE466024	3/8	.3750	25/64	3-5/32	5-23/64
DGE466025	25/64	.3906	25/64	3-5/32	5-23/64
DGE466026	13/32	.4062	27/64	3-5/16	5-7/8
DGE466027	27/64	.4219	27/64	3-15/32	5-7/8
DGE466028	7/16	.4375	15/32	3-5/8	6-7/32
DGE466029	29/64	.4531	15/32	3-25/32	6-7/32
DGE466030	15/32	.4688	15/32	3-25/32	6-7/32
DGE466031	31/64	.4844	1/2	3-15/16	6-37/64
DGE466032	1/2	.5000	1/2	4-3/32	6-37/64

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
						◎					

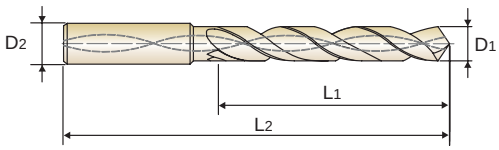
DREAM DRILLS -ALU

DGE433 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

LONG

▶Wider and deeper flute gullets for maximum chip removal
▶Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 | MG | h6 | m7 | 118° | P.79

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
DLC	D1		D2	L1	L2
DGE433030	3.0	.1181	6	28	66
DGE433031	3.1	.1220	6	28	66
DGE433032	3.2	.1260	6	28	66
DGE433033	3.3	.1299	6	28	66
DGE433034	3.4	.1339	6	28	66
DGE433035	3.5	.1378	6	28	66
DGE433036	3.6	.1417	6	28	66
DGE433037	3.7	.1457	6	28	66
DGE433038	3.8	.1496	6	36	74
DGE433039	3.9	.1535	6	36	74
DGE433040	4.0	.1575	6	36	74
DGE433041	4.1	.1614	6	36	74
DGE433042	4.2	.1654	6	36	74
DGE433043	4.3	.1693	6	36	74
DGE433044	4.4	.1732	6	36	74
DGE433045	4.5	.1772	6	36	74
DGE433046	4.6	.1811	6	36	74
DGE433047	4.7	.1850	6	36	74
DGE433048	4.8	.1890	6	44	82
DGE433049	4.9	.1929	6	44	82
DGE433050	5.0	.1969	6	44	82
DGE433051	5.1	.2008	6	44	82
DGE433052	5.2	.2047	6	44	82
DGE433053	5.3	.2087	6	44	82
DGE433054	5.4	.2126	6	44	82
DGE433055	5.5	.2165	6	44	82
DGE433056	5.6	.2205	6	44	82

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
DLC	D1		D2	L1	L2
DGE433057	5.7	.2244	6	44	82
DGE433058	5.8	.2283	6	44	82
DGE433059	5.9	.2323	6	44	82
DGE433060	6.0	.2362	6	44	82
DGE433061	6.1	.2402	8	53	91
DGE433062	6.2	.2441	8	53	91
DGE433063	6.3	.2480	8	53	91
DGE433064	6.4	.2520	8	53	91
DGE433065	6.5	.2559	8	53	91
DGE433066	6.6	.2598	8	53	91
DGE433067	6.7	.2638	8	53	91
DGE433068	6.8	.2677	8	53	91
DGE433069	6.9	.2717	8	53	91
DGE433070	7.0	.2756	8	53	91
DGE433071	7.1	.2795	8	53	91
DGE433072	7.2	.2835	8	53	91
DGE433073	7.3	.2874	8	53	91
DGE433074	7.4	.2913	8	53	91
DGE433075	7.5	.2953	8	53	91
DGE433076	7.6	.2992	8	53	91
DGE433077	7.7	.3031	8	53	91
DGE433078	7.8	.3071	8	53	91
DGE433079	7.9	.3110	8	53	91
DGE433080	8.0	.3150	8	53	91
DGE433081	8.1	.3189	10	61	103
DGE433082	8.2	.3228	10	61	103
DGE433083	8.3	.3268	10	61	103

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
						◎					

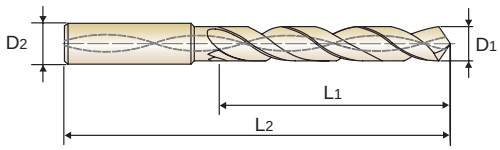
DREAM DRILLS -ALU

DGE433 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

LONG

▶Wider and deeper flute gullets for maximum chip removal
▶Special geometry and smooth coating reduces built up edge and improves finishes



DIN 6537 | MG | h6 | m7 | 118° | P.79

5 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
DLC	D1		D2	L1	L2
DGE433084	8.4	.3307	10	61	103
DGE433085	8.5	.3346	10	61	103
DGE433086	8.6	.3386	10	61	103
DGE433087	8.7	.3425	10	61	103
DGE433088	8.8	.3465	10	61	103
DGE433089	8.9	.3504	10	61	103
DGE433090	9.0	.3543	10	61	103
DGE433091	9.1	.3583	10	61	103
DGE433092	9.2	.3622	10	61	103
DGE433093	9.3	.3661	10	61	103
DGE433094	9.4	.3701	10	61	103
DGE433095	9.5	.3740	10	61	103
DGE433096	9.6	.3780	10	61	103
DGE433097	9.7	.3819	10	61	103
DGE433098	9.8	.3858	10	61	103
DGE433099	9.9	.3898	10	61	103
DGE433100	10.0	.3937	10	61	103
DGE433101	10.1	.3976	12	71	118
DGE433102	10.2	.4016	12	71	118
DGE433103	10.3	.4055	12	71	118
DGE433104	10.4	.4094	12	71	118
DGE433105	10.5	.4134	12	71	118
DGE433106	10.6	.4173	12	71	118
DGE433107	10.7	.4212	12	71	118
DGE433108	10.8	.4252	12	71	118
DGE433109	10.9	.4291	12	71	118
DGE433110	11.0	.4330	12	71	118

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
DLC	D1		D2	L1	L2
DGE433111	11.1	.4370	12	71	118
DGE433112	11.2	.4409	12	71	118
DGE433113	11.3	.4448	12	71	118
DGE433114	11.4	.4488	12	71	118
DGE433115	11.5	.4527	12	71	118
DGE433116	11.6	.4566	12	71	118
DGE433117	11.7	.4606	12	71	118
DGE433118	11.8	.4645	12	71	118
DGE433119	11.9	.4685	12	71	118
DGE433120	12.0	.4724	12	71	118
DGE433125	12.5	.4921	14	77	124
DGE433130	13.0	.5118	14	77	124
DGE433135	13.5	.5314	14	77	124
DGE433140	14.0	.5512	14	77	124
DGE433145	14.5	.5708	16	83	133
DGE433150	15.0	.5905	16	83	133
DGE433155	15.5	.6102	16	83	133
DGE433160	16.0	.6299	16	83	133
DGE433165	16.5	.6495	18	93	143
DGE433170	17.0	.6692	18	93	143
DGE433175	17.5	.6889	18	93	143
DGE433180	18.0	.7087	18	93	143
DGE433185	18.5	.7283	20	101	153
DGE433190	19.0	.7480	20	101	153
DGE433195	19.5	.7676	20	101	153
DGE433200	20.0	.7874	20	101	153

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
						◎					

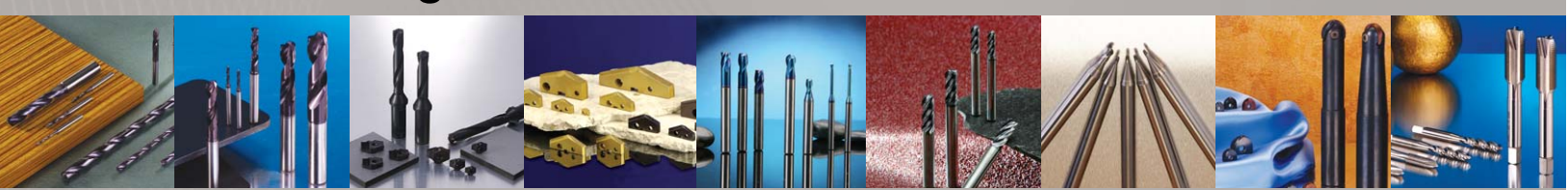
CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES, DLC COATED

DGE466, DGE433 SERIES

WORK MATERIAL		ALUMINUM ALLOY CASTING ALUMINUM DIE CASTING		WROUGHT ALUMINUM ALLOY	
DIAMETER		N	S	N	S
METRIC	INCH				
3.0 ~ 6.0	.1181 ~ .2362	8000 ~ 15000	.008 ~ .020	8000 ~ 15000	.006 ~ .012
10.0	~ .3937	6000 ~ 10500	.012 ~ .039	6000 ~ 10500	.008 ~ .016
14.0	~ .5512	4500 ~ 5800	.012 ~ .039	4500 ~ 5800	.008 ~ .016
20.0	~ .7874	3200 ~ 4600	.012 ~ .039	3200 ~ 4600	.008 ~ .016

N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



CARBIDE

Being the best through innovation

DREAM DRILLS -MQL TYPE

- WITH COOLANT HOLES
Minimum Quantity Lubrication. Drilling Deep Holes, 10D, 15D & 20D

SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)

Minimum Quantity Lubrication. Drilling Deep Holes, 10D, 15D & 20D

ITEM	MODEL	DESCRIPTION		SIZE MIN	SIZE MAX	PAGE
METRIC						
10XD DH510		CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES	*EXTRA LONG*	D3.0	D14.0	84
15XD DH515		CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES	*EXTRA LONG*	D3.0	D12.0	85
20XD DH520		CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES	*EXTRA LONG*	D3.0	D12.0	85
		RECOMMENDED CUTTING CONDITIONS				86

◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○				○		
◎	◎	○			○				○		
◎	◎	○			○				○		

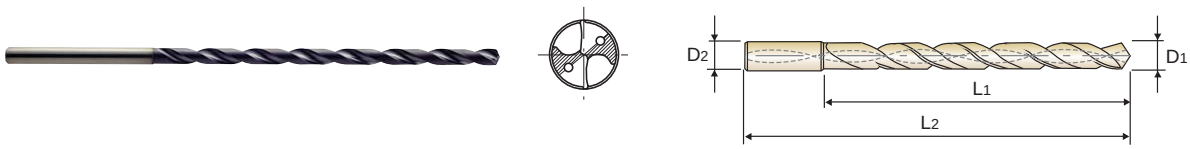
DREAM DRILLS -MQL TYPE

DH510 SERIES

CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES

EXTRA LONG

- ▶Non step drilling up to 10 times of drill diameter
- ▶Available for processing MQL(Minimum Quantity Lubrication)
- ▶Excellent positioning – Bush is not necessary
- ▶Special design – Good chip removal
- ▶Powerful drilling



MG | 30° | h6 | h7 | 140° P.86

10 × D

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH510030	**3.0**	**.1181**	3	39	90
DH510033	**3.3**	**.1299**	4	46	97
DH510035	**3.5**	**.1378**	4	46	97
DH510040	**4.0**	**.1575**	4	52	103
DH510042	**4.2**	**.1654**	5	59	112
DH510045	**4.5**	**.1772**	5	59	112
DH510050	**5.0**	**.1969**	5	65	118
DH510055	**5.5**	**.2165**	6	72	127
DH510060	**6.0**	**.2362**	6	78	133
DH510065	**6.5**	**.2559**	7	85	141
DH510068	**6.8**	**.2677**	7	91	147
DH510070	**7.0**	**.2756**	7	91	147
DH510075	**7.5**	**.2953**	8	98	155

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH510080	**8.0**	**.3150**	8	104	161
DH510085	**8.5**	**.3346**	9	111	169
DH510090	**9.0**	**.3543**	9	117	175
DH510095	**9.5**	**.3740**	10	124	182
DH510100	**10.0**	**.3937**	10	130	188
DH510105	**10.5**	**.4134**	11	137	201
DH510110	**11.0**	**.4330**	11	143	207
DH510115	**11.5**	**.4527**	12	150	215
DH510120	**12.0**	**.4724**	12	156	221
DH510125	**12.5**	**.4921**	13	163	229
DH510130	**13.0**	**.5118**	13	169	235
DH510135	**13.5**	**.5314**	14	176	243
DH510140	**14.0**	**.5512**	14	182	249

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○				○		

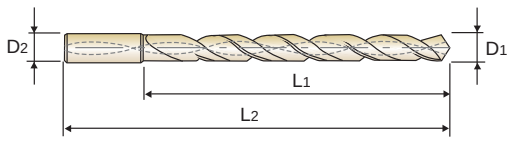
DREAM DRILLS -MQL TYPE

DH515 SERIES
DH520 SERIES

CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES

EXTRA LONG

- ▶Non step drilling up to 15 times (20 times) of drill diameter
- ▶Available for processing MQL(Minimum Quantity Lubrication)
- ▶Excellent positioning – Bush is not necessary
- ▶Special design – Good chip removal
- ▶Powerful drilling



MG | 30° | h6 | h7 | 140° | P.86

15 × D (DH515) | 20 × D (DH520)

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH515030	**3.0**	**.1181**	3	54	105
DH515035	**3.5**	**.1378**	4	63	114
DH515040	**4.0**	**.1575**	4	72	123
DH515045	**4.5**	**.1772**	5	81	134
DH515050	**5.0**	**.1969**	5	90	143
DH515055	**5.5**	**.2165**	6	99	154
DH515060	**6.0**	**.2362**	6	108	163
DH515070	**7.0**	**.2756**	7	126	182
DH515080	**8.0**	**.3150**	8	144	201
DH515090	**9.0**	**.3543**	9	162	220
DH515100	**10.0**	**.3937**	10	180	238
DH515110	**11.0**	**.4330**	11	198	262
DH515120	**12.0**	**.4724**	12	216	281

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH520030	**3.0**	**.1181**	3	69	120
DH520035	**3.5**	**.1378**	4	81	132
DH520040	**4.0**	**.1575**	4	92	143
DH520045	**4.5**	**.1772**	5	104	157
DH520050	**5.0**	**.1969**	5	115	168
DH520055	**5.5**	**.2165**	6	127	182
DH520060	**6.0**	**.2362**	6	138	193
DH520070	**7.0**	**.2756**	7	161	217
DH520080	**8.0**	**.3150**	8	184	241
DH520090	**9.0**	**.3543**	9	207	265
DH520100	**10.0**	**.3937**	10	230	288
DH520120	**12.0**	**.4724**	12	276	341

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○				○		

DREAM DRILLS -MQL TYPE

RECOMMENDED CUTTING CONDITIONS

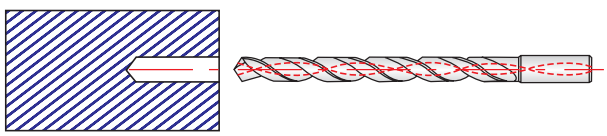
CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES, TiAlN COATED

DH510, DH515, DH520 SERIES

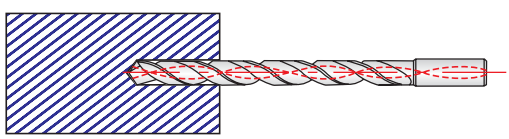
WORK MATERIAL		CARBON STEELS ALLOY STEELS ~ 1060 N/mm²		CAST IRON 250 ~ 350 N/mm²		DUCTILE CAST IRON 400 ~ 500 N/mm²		DUCTILE CAST IRON	
STRENGTH		< HRc 25		< HRc 10		> HRc 10			
DIAMETER		N	S	N	S	N	S	N	S
METRIC	INCH								
3.0	.1181	7500	.0023~.0047	7500	.0023~.0047	7500	.0023~.0047	5300	.0023~.0047
4.0	.1575	6400	.0031~.0063	6400	.0031~.0063	5600	.0031~.0063	5000	.0031~.0063
5.0	.1969	5800	.0039~.0078	5800	.0039~.0078	4500	.0039~.0078	4500	.0039~.0078
6.0	.2362	4800	.0047~.0094	4800	.0047~.0094	3800	.0047~.0094	3800	.0047~.0094
8.0	.3150	3600	.0063~.0110	3600	.0063~.0110	2800	.0063~.0110	2800	.0063~.0110
10.0	.3937	2900	.0078~.0137	2900	.0078~.0137	2300	.0078~.0137	2300	.0078~.0137
12.0	.4724	2400	.0094~.0165	2400	.0094~.0165	1900	.0094~.0165	1900	.0094~.0165

▶ **Coolant Pressure : 900 PSI**

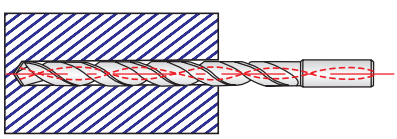
N = R.P.M
S = Inch per Revolution(inch/rev)



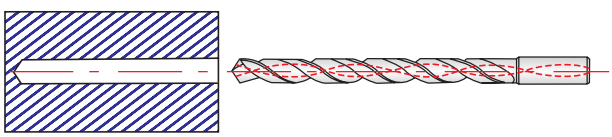
1. Use a YG 3xD Drill to produce a guide hole no larger than .004 over the required drill size. Drill the pilot hole 2xD deep hole.



2. Enter the guide hole at 50 SFM surface and .010 feed rate / per rev.



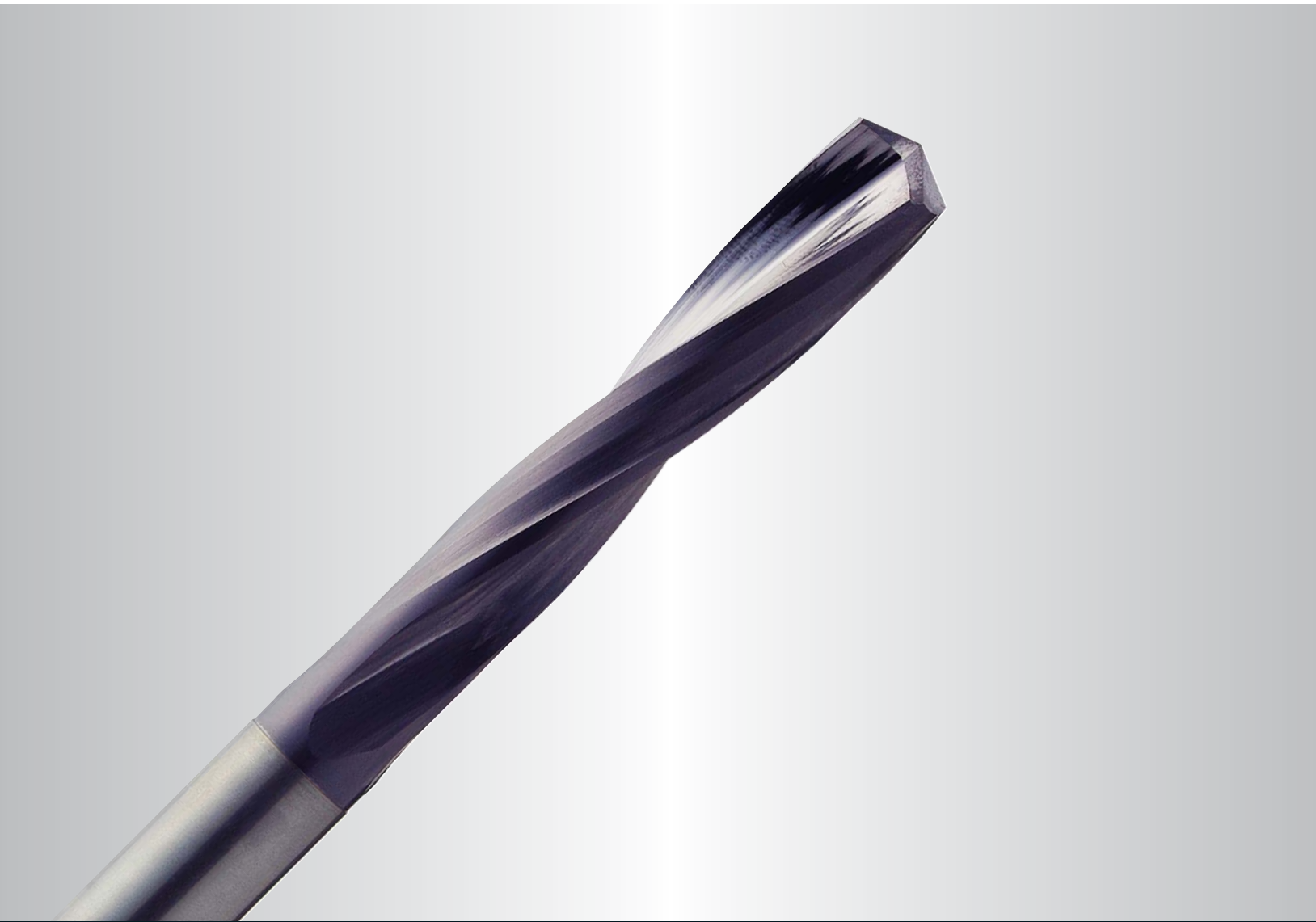
3. Before hitting the bottom of the guide hole, Increase SFM and feed rate for normal drilling.



4. After drilling, to withdraw drill, reduce SFM to 50 @ 10 inches per minute.

CARBIDE

Being the best through innovation



DREAM DRILLS
- For HIGH HARDENED STEELS

- **HIGH HARDENED STEELS, HRc50~HRc70**

SOLID CARBIDE DREAM DRILLS for HIGH HARDENED STEELS

High Hardened Steels, HRc50~HRc70

◎ : Excellent
○ : Good

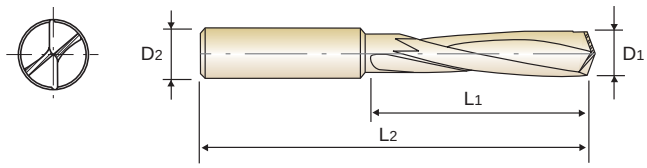
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
			◎	◎							
			◎	◎							

DREAM DRILLS for HIGH HARDENED STEELS

DH501 SERIES

CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

▶ **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
▶ **Advantage** : Special Design
Minimum of cutting load through special thinning
Good chip removal
Powerful Drilling
▶ **Tolerance** : Dia. Tolerance ⌀D1: See page 247, Shank Tolerance ⌀D2: -.0001 -.0005



MG | 15° | h6 | 140° P.93

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH501001	1/8	.1250	1/8	21/32	2
DH501002	#30	.1285	3/16	23/32	2
DH501003	#29	.1360	3/16	13/16	2
DH501004	#28	.1405	3/16	13/16	2
DH501005	9/64	.1406	3/16	13/16	2
DH501006	#27	.1440	3/16	13/16	2
DH501007	#26	.1470	3/16	13/16	2
DH501008	#25	.1495	3/16	7/8	2-1/16
DH501009	#24	.1520	3/16	7/8	2-1/16
DH501010	#23	.1540	3/16	7/8	2-1/16
DH501011	5/32	.1562	3/16	7/8	2-1/16
DH501012	#22	.1570	3/16	7/8	2-1/16
DH501013	#21	.1590	3/16	7/8	2-1/16
DH501014	#20	.1610	3/16	1	2-1/2
DH501015	#19	.1660	3/16	1	2-1/2
DH501016	11/64	.1719	3/16	1-1/8	2-3/4
DH501017	#15	.1800	3/16	1-1/8	2-3/4
DH501018	#14	.1820	3/16	1-1/8	2-3/4
DH501019	3/16	.1875	3/16	1-1/8	2-3/4
DH501020	#10	.1935	1/4	1-9/32	2-7/8
DH501021	#9	.1960	1/4	1-9/32	2-7/8
DH501022	#8	.1990	1/4	1-9/32	2-7/8
DH501023	#7	.2010	1/4	1-9/32	2-7/8
DH501024	13/64	.2031	1/4	1-9/32	2-7/8
DH501025	#6	.2040	1/4	1-9/32	2-7/8

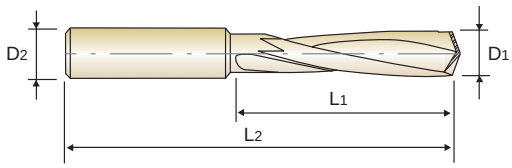
EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH501026	#5	.2055	1/4	1-9/32	2-7/8
DH501027	#4	.2090	1/4	1-9/32	2-7/8
DH501028	#3	.2130	1/4	1-13/32	3
DH501029	7/32	.2188	1/4	1-13/32	3
DH501030	#2	.2210	1/4	1-13/32	3
DH501031	#1	.2280	1/4	1-13/32	3
DH501032	15/64	.2344	1/4	1-13/32	3
DH501033	B	.2380	1/4	1-19/32	3-1/8
DH501034	C	.2420	1/4	1-19/32	3-1/8
DH501035	D	.2460	1/4	1-19/32	3-1/8
DH501036	1/4	.2500	1/4	1-19/32	3-1/8
DH501037	F	.2570	3/8	1-19/32	3-1/8
DH501038	G	.2610	3/8	1-19/32	3-1/8
DH501039	17/64	.2656	3/8	1-19/32	3-1/8
DH501040	I	.2720	3/8	1-25/32	3-3/8
DH501041	J	.2770	3/8	1-25/32	3-3/8
DH501042	9/32	.2812	3/8	1-25/32	3-3/8
DH501043	L	.2900	3/8	1-25/32	3-3/8
DH501044	M	.2950	3/8	1-25/32	3-3/8
DH501045	19/64	.2969	3/8	1-25/32	3-3/8
DH501046	N	.3020	3/8	1-31/32	3-7/8
DH501047	5/16	.3125	3/8	1-31/32	3-7/8
DH501048	O	.3160	3/8	1-31/32	3-7/8
DH501049	21/64	.3281	3/8	1-31/32	3-7/8
DH501050	Q	.3320	3/8	1-31/32	3-7/8

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
			◎	◎							

CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

▶ **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
▶ **Advantage** : Special Design
Minimum of cutting load through special thinning
Good chip removal
Powerful Drilling
▶ **Tolerance** : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005



MG | 15° | h6 | 140° P.93

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH501051	R	.3390	3 / 8	2-1 / 4	4-1 / 8
DH501052	11 / 32	.3438	3 / 8	2-1 / 4	4-1 / 8
DH501053	23 / 64	.3594	3 / 8	2-1 / 4	4-1 / 8
DH501054	U	.3680	3 / 8	2-1 / 4	4-1 / 8
DH501055	3 / 8	.3750	3 / 8	2-1 / 4	4-1 / 8
DH501056	V	.3770	1 / 2	2-1 / 2	4-3 / 8
DH501057	25 / 64	.3906	1 / 2	2-1 / 2	4-3 / 8
DH501058	X	.3970	1 / 2	2-1 / 2	4-3 / 8
DH501059	Y	.4040	1 / 2	2-1 / 2	4-3 / 8
DH501060	13 / 32	.4062	1 / 2	2-1 / 2	4-3 / 8
DH501061	Z	.4130	1 / 2	2-1 / 2	4-3 / 8
DH501062	27 / 64	.4219	1 / 2	2-13 / 16	4-5 / 8
DH501063	7 / 16	.4375	1 / 2	2-13 / 16	4-5 / 8
DH501064	29 / 64	.4531	1 / 2	2-13 / 16	4-5 / 8
DH501065	15 / 32	.4688	1 / 2	2-13 / 16	4-5 / 8
DH501066	31 / 64	.4844	1 / 2	2-13 / 16	4-5 / 8
DH501067	1 / 2	.5000	1 / 2	3-1 / 16	5

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
DH501068	33 / 64	.5156	5 / 8	3-1 / 16	5
DH501069	17 / 32	.5312	5 / 8	3-1 / 16	5
DH501070	35 / 64	.5469	5 / 8	3-1 / 16	5
DH501071	9 / 16	.5625	5 / 8	3-1 / 16	5
DH501072	37 / 64	.5781	5 / 8	3-9 / 32	5-1 / 4
DH501073	19 / 32	.5937	5 / 8	3-9 / 32	5-1 / 4
DH501074	39 / 64	.6094	5 / 8	3-9 / 32	5-1 / 4
DH501075	5 / 8	.6250	5 / 8	3-9 / 32	5-1 / 4
DH501076	41 / 64	.6406	3 / 4	3-9 / 32	5-1 / 4
DH501077	21 / 32	.6563	3 / 4	3-11 / 16	5-5 / 8
DH501078	43 / 64	.6719	3 / 4	3-11 / 16	5-5 / 8
DH501079	11 / 16	.6875	3 / 4	3-11 / 16	5-5 / 8
DH501080	45 / 64	.7031	3 / 4	3-11 / 16	5-5 / 8
DH501081	23 / 32	.7188	3 / 4	3-3 / 4	6
DH501082	47 / 64	.7344	3 / 4	3-3 / 4	6
DH501083	3 / 4	.7500	3 / 4	3-3 / 4	6

◎ : Excellent ○ : Good

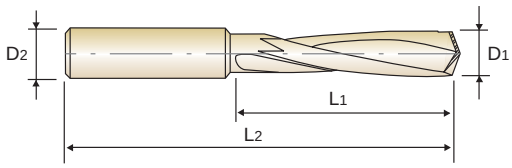
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
			◎	◎							

DREAM DRILLS for HIGH HARDENED STEELS

DH500 SERIES

CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

▶ **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
▶ **Advantage** : Special Design
Minimum of cutting load through special thinning
Good chip removal
Powerful Drilling



MG | 15° | h6 | h7 | 140° P.93

Unit : mm

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH500010	1.0	.0394	3	6	40
DH500011	1.1	.0433	3	6	40
DH500012	1.2	.0472	3	6	40
DH500013	1.3	.0512	3	8	40
DH500014	1.4	.0551	3	8	40
DH500015	1.5	.0591	3	8	40
DH500016	1.6	.0630	3	10	40
DH500017	1.7	.0669	3	10	40
DH500018	1.8	.0709	3	10	40
DH500019	1.9	.0748	3	10	40
DH500020	2.0	.0787	3	12	42
DH500025	2.5	.0984	3	14	44
DH500026	2.6	.1024	3	16	44
DH500028	2.8	.1102	3	16	46
DH500030	3.0	.1181	3	18	46
DH500033	3.3	.1299	4	18	48
DH500034	3.4	.1339	4	20	50
DH500035	3.5	.1378	4	20	50
DH500038	3.8	.1496	4	22	52
DH500040	4.0	.1575	4	22	52
DH500041	4.1	.1614	6	25	65
DH500042	4.2	.1654	6	25	65
DH500043	4.3	.1693	6	28	68
DH500044	4.4	.1732	6	28	68
DH500045	4.5	.1772	6	28	68
DH500046	4.6	.1811	6	28	68
DH500048	4.8	.1890	6	32	72
DH500049	4.9	.1929	6	32	72
DH500050	5.0	.1969	6	32	72

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Metric	Inch			
TiAlN	D1		D2	L1	L2
DH500051	5.1	.2008	6	32	72
DH500052	5.2	.2047	6	32	72
DH500053	5.3	.2087	6	32	72
DH500055	5.5	.2165	6	35	75
DH500060	6.0	.2362	6	35	75
DH500062	6.2	.2441	8	40	80
DH500065	6.5	.2559	8	40	80
DH500068	6.8	.2677	8	45	85
DH500069	6.9	.2717	8	45	85
DH500070	7.0	.2756	8	45	85
DH500075	7.5	.2953	8	45	85
DH500080	8.0	.3150	8	50	98
DH500085	8.5	.3346	10	50	98
DH500086	8.6	.3386	10	57	105
DH500088	8.8	.3465	10	57	105
DH500090	9.0	.3543	10	57	105
DH500093	9.3	.3661	10	57	105
DH500095	9.5	.3740	10	57	105
DH500100	10.0	.3937	10	63	111
DH500102	10.2	.4016	12	63	111
DH500103	10.3	.4055	12	63	111
DH500105	10.5	.4134	12	63	111
DH500108	10.8	.4252	12	71	119
DH500110	11.0	.4331	12	71	119
DH500115	11.5	.4528	12	71	119
DH500120	12.0	.4724	12	71	119
DH500121	12.1	.4764	14	77	125
DH500140	14.0	.5512	14	77	125

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
			◎	◎							

CARBIDE, DREAM DRILLS for High HARDENED STEEL HRc50~HRc70, TiAlN COATED

DH501 SERIES

WORK MATERIAL	HARDENED STEELS					
	HRc 50 ~ 55		HRc 55 ~ 60		HRc 60 ~ 70	
DRILLING SPEED	45 ~ 72 SFM		32 ~ 52 SFM		26 ~ 42 SFM	
DIAMETER	N	S	N	S	N	S
5/64	2860	~ .0015	2000	~ .0015	1900	~ .0011
1/8	1900	~ .0015	1330	~ .0015	1250	~ .0015
5/32	1430	~ .0015	1000	~ .0015	950	~ .0015
13/64	1150	~ .0015	800	~ .0015	750	~ .0015
15/64	960	~ .0015	670	~ .0015	630	~ .0015
5/16	720	~ .0015	500	~ .0015	480	~ .0015
25/64	570	~ .0015	400	~ .0015	380	~ .0015
15/32	480	~ .0015	330	~ .0015	320	~ .0015
9/16	435	~ .0015	280	~ .0015	270	~ .0015
41/64	380	~ .0015	250	~ .0015	240	~ .0015
11/16	325	~ .0015	235	~ .0015	190	~ .0015
47/64	310	~ .0015	220	~ .0015	180	~ .0015

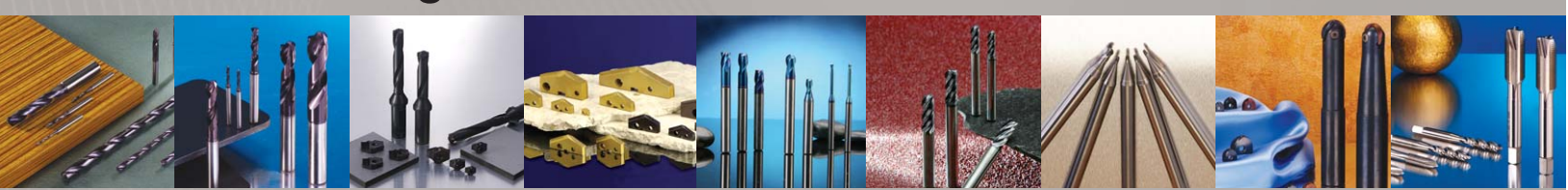
N = R.P.M
S = Inch per Revolution(inch/rev.)

DH500 SERIES

WORK MATERIAL		HARDENED STEELS					
		HRc 50 ~ 55		HRc 55 ~ 60		HRc 60 ~ 70	
DRILLING SPEED		45 ~ 72 SFM		32 ~ 52 SFM		26 ~ 42 SFM	
DIAMETER		N	S	N	S	N	S
METRIC	INCH						
3.0	.1181	1900	~ .0015	1330	~ .0015	1250	~ .0015
4.0	.1575	1430	~ .0015	1000	~ .0015	950	~ .0015
5.0	.1969	1150	~ .0015	800	~ .0015	750	~ .0015
6.0	.2362	960	~ .0015	670	~ .0015	630	~ .0015
8.0	.3150	720	~ .0015	500	~ .0015	480	~ .0015
10.0	.3937	570	~ .0015	400	~ .0015	380	~ .0015
12.0	.4724	480	~ .0015	330	~ .0015	320	~ .0015
14.0	.5512	438	~ .0015	282	~ .0015	272	~ .0015

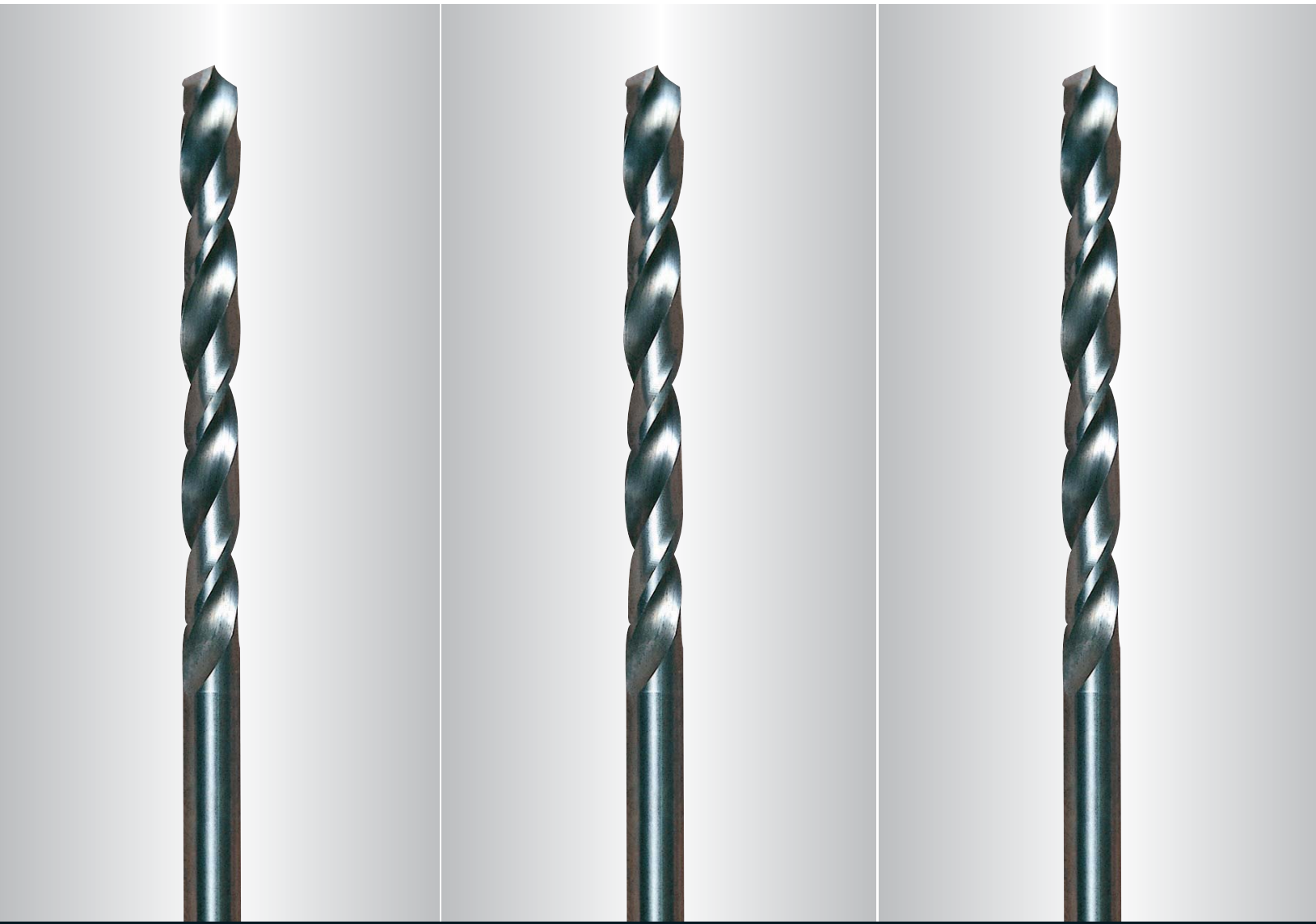
N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



CARBIDE

Being the best through innovation



STANDARD CARBIDE DRILLS

- **General Purpose**
  118° Point

STANDARD SOLID CARBIDE DRILLS

General Purpose
118° Point

◎ : Excellent
○ : Good

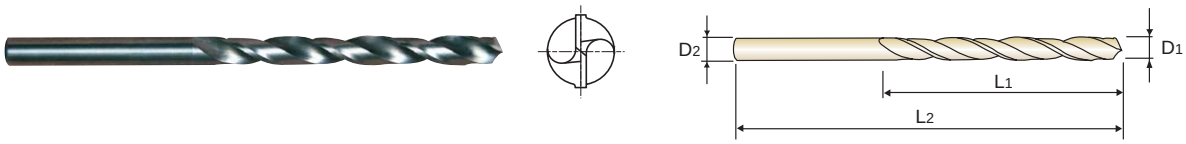
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	◎		
◎	◎				○	○	○	○	◎		
◎	◎				○	○	○	○	◎		

STANDARD CARBIDE DRILLS

D5412 SERIES

CARBIDE DRILLS

JOBBER



MG | N 30° | h6 | h7 | 118° | P.101

$D_1 = D_2$

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	$D_1 = D_2$	
			L_1	L_2
D5412101	1	.2280	1-3 / 4	3
D5412102	2	.2210	1-3 / 4	3
D5412103	3	.2130	1-3 / 4	3
D5412104	4	.2090	1-3 / 4	3
D5412105	5	.2055	1-3 / 4	3
D5412106	6	.2040	1-3 / 4	3
D5412107	7	.2010	1-3 / 4	3
D5412108	8	.1990	1-3 / 4	3
D5412109	9	.1960	1-3 / 4	3
D5412110	10	.1935	1-5 / 8	2-3 / 4
D5412111	11	.1910	1-5 / 8	2-3 / 4
D5412112	12	.1890	1-5 / 8	2-3 / 4
D5412113	13	.1850	1-5 / 8	2-3 / 4
D5412114	14	.1820	1-5 / 8	2-3 / 4
D5412115	15	.1800	1-5 / 8	2-3 / 4
D5412116	16	.1770	1-5 / 8	2-3 / 4
D5412117	17	.1730	1-5 / 8	2-3 / 4
D5412118	18	.1695	1-5 / 8	2-3 / 4
D5412119	19	.1660	1-5 / 8	2-3 / 4
D5412120	20	.1610	1-3 / 8	2-1 / 2
D5412121	21	.1590	1-3 / 8	2-1 / 2
D5412122	22	.1570	1-3 / 8	2-1 / 2
D5412123	23	.1540	1-3 / 8	2-1 / 2
D5412124	24	.1520	1-3 / 8	2-1 / 2
D5412125	25	.1495	1-3 / 8	2-1 / 2
D5412126	26	.1470	1-3 / 8	2-1 / 2
D5412127	27	.1440	1-3 / 8	2-1 / 2
D5412128	28	.1405	1-3 / 8	2-1 / 2

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	$D_1 = D_2$	
			L_1	L_2
D5412129	29	.1360	1-3 / 8	2-1 / 2
D5412130	30	.1285	1-1 / 4	2-1 / 4
D5412131	31	.1200	1-1 / 4	2-1 / 4
D5412132	32	.1160	1-1 / 4	2-1 / 4
D5412133	33	.1130	1-1 / 4	2-1 / 4
D5412134	34	.1110	1-1 / 4	2-1 / 4
D5412135	35	.1100	1-1 / 4	2-1 / 4
D5412136	36	.1065	1-1 / 4	2-1 / 4
D5412137	37	.1040	1-1 / 4	2-1 / 4
D5412138	38	.1015	1-1 / 4	2-1 / 4
D5412139	39	.0995	1-1 / 4	2-1 / 4
D5412140	40	.0980	1	2
D5412141	41	.0960	1	2
D5412142	42	.0935	1	2
D5412143	43	.0890	1	2
D5412144	44	.0860	1	2
D5412145	45	.0820	7 / 8	1-3 / 4
D5412146	46	.0810	7 / 8	1-3 / 4
D5412147	47	.0785	7 / 8	1-3 / 4
D5412148	48	.0760	7 / 8	1-3 / 4
D5412149	49	.0730	7 / 8	1-3 / 4
D5412150	50	.0700	7 / 8	1-3 / 4
D5412151	51	.0670	3 / 4	1-1 / 2
D5412152	52	.0635	3 / 4	1-1 / 2
D5412153	53	.0595	3 / 4	1-1 / 2
D5412154	54	.0550	3 / 4	1-1 / 2
D5412155	55	.0520	3 / 4	1-1 / 2
D5412156	56	.0465	3 / 4	1-1 / 2

◎ : Excellent ○ : Good

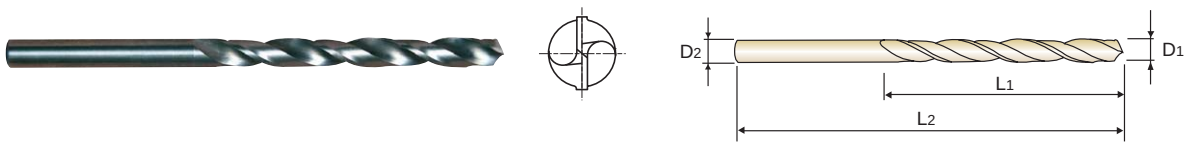
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	◎		

STANDARD CARBIDE DRILLS

D5413 SERIES

CARBIDE DRILLS

JOBBER



MG | N 30° | h6 | h7 | 118° | P.101

$D_1 = D_2$

▶ Letter sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Letter	Decimal		
	$D_1 = D_2$		L_1	L_2
D5413201	A	.2340	2	3-1 / 4
D5413202	B	.2380	2	3-1 / 4
D5413203	C	.2420	2	3-1 / 4
D5413204	D	.2460	2	3-1 / 4
D5413205	E	.2500	2	3-1 / 4
D5413206	F	.2570	2	3-1 / 4
D5413207	G	.2610	2-1 / 8	3-1 / 2
D5413208	H	.2660	2-1 / 8	3-1 / 2
D5413209	I	.2720	2-1 / 8	3-1 / 2
D5413210	J	.2770	2-1 / 8	3-1 / 2
D5413211	K	.2810	2-1 / 8	3-1 / 2
D5413212	L	.2900	2-1 / 8	3-1 / 2
D5413213	M	.2950	2-3 / 8	3-3 / 4

EDP No.	Diameter		Flute Length	Overall Length
	Letter	Decimal		
	$D_1 = D_2$		L_1	L_2
D5413214	N	.3020	2-3 / 8	3-3 / 4
D5413215	O	.3160	2-3 / 8	3-3 / 4
D5413216	P	.3230	2-3 / 8	3-3 / 4
D5413217	Q	.3320	2-1 / 2	4
D5413218	R	.3390	2-1 / 2	4
D5413219	S	.3480	2-1 / 2	4
D5413220	T	.3580	2-3 / 4	4-1 / 4
D5413221	U	.3680	2-3 / 4	4-1 / 4
D5413222	V	.3770	2-3 / 4	4-1 / 4
D5413223	W	.3860	2-7 / 8	4-1 / 2
D5413224	X	.3970	2-7 / 8	4-1 / 2
D5413225	Y	.4040	2-7 / 8	4-1 / 2
D5413226	Z	.4130	2-7 / 8	4-1 / 2

◎ : Excellent ○ : Good

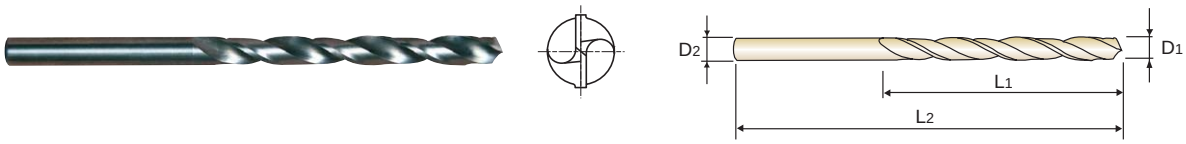
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	◎		

STANDARD CARBIDE DRILLS

D5417 SERIES

CARBIDE DRILLS

JOBBER



MG | N 30° | h6 | h7 | 118° | P.101

$D_1 = D_2$

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
	$D_1 = D_2$		L_1	L_2
D5417003	3/64	.0469	3 / 4	1-1 / 2
D5417004	1/16	.0625	3 / 4	1-1 / 2
D5417005	5/64	.0781	7 / 8	1-3 / 4
D5417006	3/32	.0938	1	2
D5417007	7/64	.1094	1-1 / 4	2-1 / 4
D5417008	1/8	.1250	1-1 / 4	2-1 / 4
D5417009	9/64	.1406	1-3 / 8	2-1 / 2
D5417010	5/32	.1563	1-3 / 8	2-1 / 2
D5417011	11/64	.1719	1-5 / 8	2-3 / 4
D5417012	3/16	.1875	1-5 / 8	2-3 / 4
D5417013	13/64	.2031	1-3 / 4	3
D5417014	7/32	.2188	1-3 / 4	3
D5417015	15/64	.2344	2	3-1 / 4
D5417016	1/4	.2500	2x	3-1 / 4
D5417017	17/64	.2656	2-1 / 8	3-1 / 2

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
	$D_1 = D_2$		L_1	L_2
D5417018	9/32	.2813	2-1 / 8	3-1 / 2
D5417019	19/64	.2969	2-3 / 8	3-3 / 4
D5417020	5/16	.3125	2-3 / 8	3-3 / 4
D5417021	21/64	.3281	2-1 / 2	4
D5417022	11/32	.3438	2-1 / 2	4
D5417023	23/64	.3594	2-3 / 4	4-1 / 4
D5417024	3/8	.3750	2-3 / 4	4-1 / 4
D5417025	25/64	.3906	2-7 / 8	4-1 / 2
D5417026	13/32	.4063	2-7 / 8	4-1 / 2
D5417027	27/64	.4219	2-7 / 8	4-1 / 2
D5417028	7/16	.4375	2-7 / 8	4-1 / 2
D5417029	29/64	.4531	3	4-3 / 4
D5417030	15/32	.4688	3	4-3 / 4
D5417031	31/64	.4844	3	4-3 / 4
D5417032	1/2	.5000	3	4-3 / 4

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	◎		

CARBIDE DRILLS

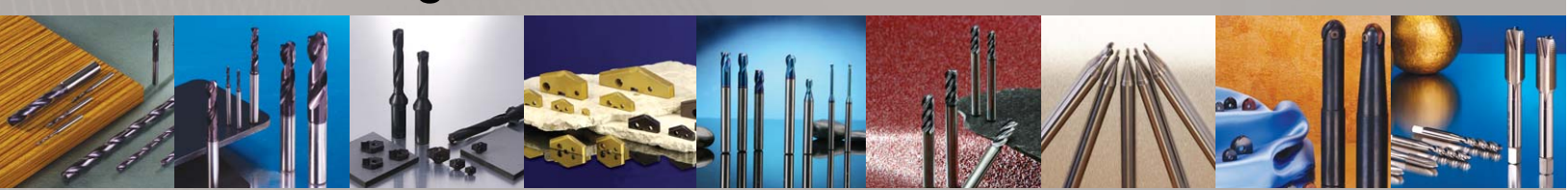
D5412, D5413, D5417 SERIES

WORK MATERIAL	NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
DIAMETER	N	S	N	S	N	S	N	S
3/64	23000	.0012	17200	.0012	32000	.0016	23000	.0016
5/64	11500	.0016	8600	.0016	16000	.0020	11500	.0020
1/8	7800	.0020	5750	.0020	10500	.0024	7600	.0024
5/32	5800	.0024	4300	.0024	7800	.0028	5700	.0028
13/64	4700	.0028	3450	.0028	6200	.0031	4550	.0031
15/64	3900	.0031	2850	.0031	5200	.0035	3800	.0035
9/32	3350	.0035	2450	.0035	4500	.0039	3250	.0039
5/16	2900	.0039	2150	.0039	3900	.0047	2850	.0047
23/64	2600	.0043	1900	.0043	3450	.0055	2550	.0055
25/64	2350	.0047	1700	.0047	3100	.0063	2300	.0063
7/16	2150	.0051	1600	.0051	2850	.0071	2100	.0071
15/32	1950	.0055	1450	.0055	2600	.0079	1900	.0079
33/64	1800	.0063	1350	.0063	2400	.0079	1750	.0079

WORK MATERIAL	STAINLESS STEELS		Al-Si ALLOY, Si<10%		Al-Si ALLOY, Si>10%		Ti, Ni ALLOY STEELS	
DIAMETER	N	S	N	S	N	S	N	S
3/64	12000	.0016	54000	.0020	42000	.0020	11800	.0008
5/64	6000	.0012	27000	.0024	21000	.0024	5900	.0012
1/8	4000	.0016	18000	.0028	14000	.0028	3900	.0016
5/32	3000	.0020	13000	.0031	10500	.0031	2950	.0020
13/64	2400	.0024	10500	.0035	8500	.0035	2350	.0024
15/64	2000	.0028	8800	.0043	7100	.0043	1950	.0028
9/32	1700	.0031	7600	.0051	6100	.0051	1700	.0031
5/16	1500	.0035	6600	.0059	5350	.0059	1450	.0035
23/64	1350	.0039	5900	.0067	4750	.0067	1300	.0039
25/64	1200	.0043	5300	.0075	4250	.0075	1200	.0043
7/16	1100	.0047	4850	.0083	3900	.0083	1050	.0047
15/32	1000	.0051	4450	.0091	3550	.0091	980	.0051
33/64	950	.0051	4100	.0098	3300	.0098	905	.0051

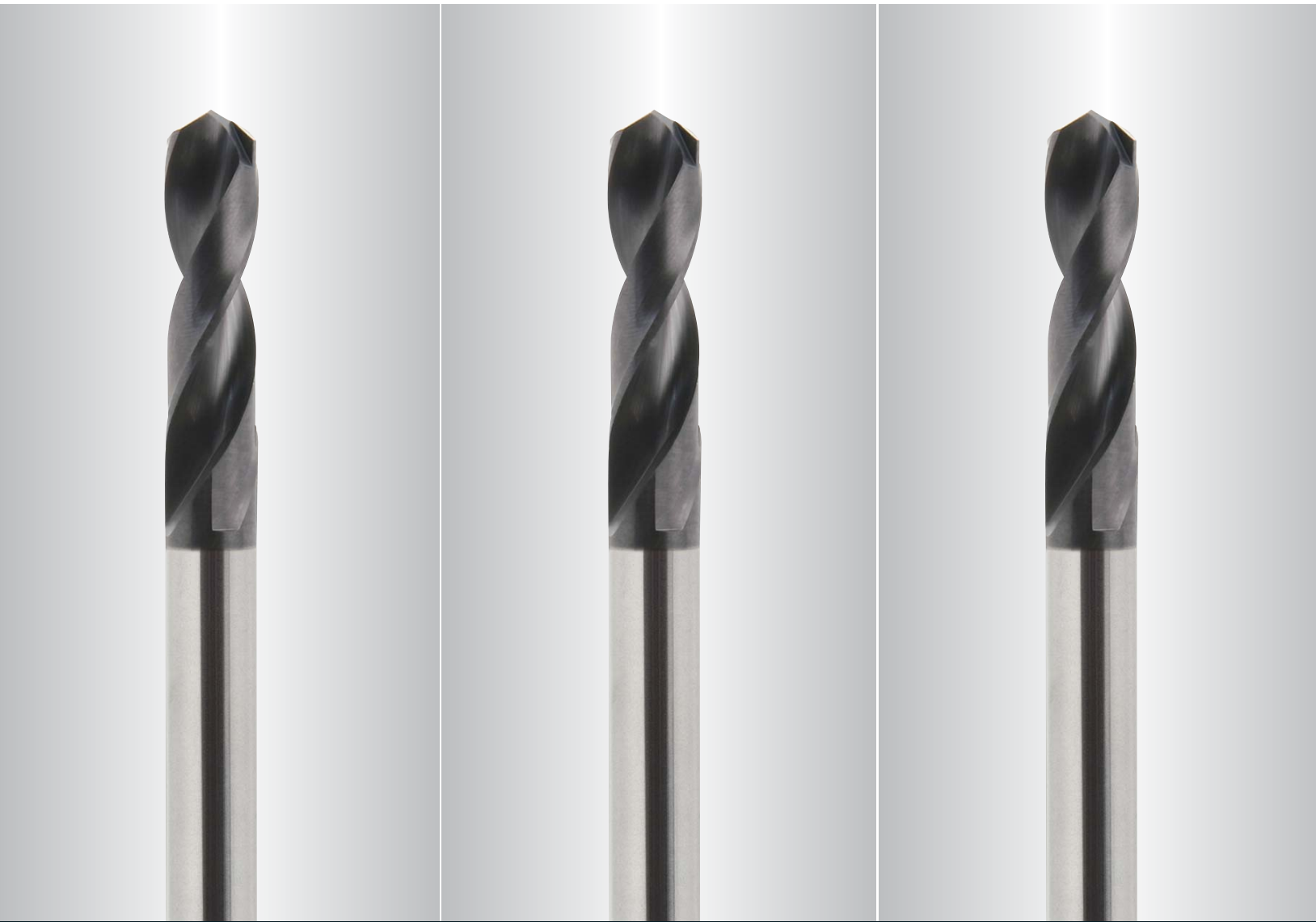
N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation



MULTI-1 DRILLS

- **HSS-PM MULTI-1 DRILLS**
  Multi Purpose Drilling. Particularly for Stainless Steels, Titanium

PREMIUM HSS-PM MULTI-1 DRILLS

Premium HSS-PM Drills for wide range of applications
- Carbon Steels, Alloy Steels, Stainless steels, Titanium etc.

◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	◎	◎		
◎	◎	○			○	○	○	◎	◎		
◎	◎	○			○	○	○	◎	◎		

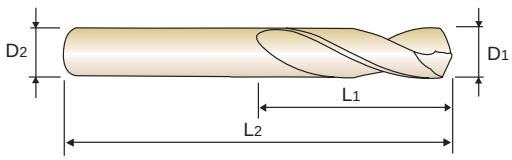
MULTI-1 DRILLS

CDRA05 SERIES

PREMIUM HSS-PM MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.



PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.109

▶ M15 / Fractional sizes

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
M15006	3/32	.0938	1/8	1/2	1-3/4
M15007	7/64	.1094	1/8	5/8	1-7/8
M15008	1/8	.1250	1/8	3/4	2
M15009	9/64	.1406	3/16	13/16	2-1/8
M15010	5/32	.1563	3/16	13/16	2-1/8
M15011	11/64	.1719	3/16	1	2-3/8
M15012	3/16	.1875	3/16	1	2-3/8
M15013	13/64	.2031	1/4	1-1/8	2-7/8
M15014	7/32	.2188	1/4	1-1/8	2-7/8
M15015	15/64	.2344	1/4	1-1/4	3
M15016	1/4	.2500	1/4	1-1/4	3
M15017	17/64	.2656	3/8	1-3/8	3-3/16
M15018	9/32	.2813	3/8	1-3/8	3-3/16
M15019	19/64	.2969	3/8	1-3/8	3-3/16

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D1		D2	L1	L2
M15020	5/16	.3125	3/8	1-1/2	3-3/8
M15021	21/64	.3281	3/8	1-1/2	3-3/8
M15022	11/32	.3438	3/8	1-5/8	3-1/2
M15023	23/64	.3594	3/8	1-5/8	3-1/2
M15024	3/8	.3750	3/8	1-5/8	3-1/2
M15025	25/64	.3906	1/2	1-11/16	3-7/8
M15026	13/32	.4063	1/2	1-11/16	3-7/8
M15027	27/64	.4219	1/2	1-7/8	4-1/8
M15028	7/16	.4375	1/2	1-7/8	4-1/8
M15029	29/64	.4531	1/2	1-7/8	4-1/8
M15030	15/32	.4688	1/2	2	4-1/4
M15031	31/64	.4844	1/2	2	4-1/4
M15032	1/2	.5000	1/2	2	4-1/4

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	◎	◎		

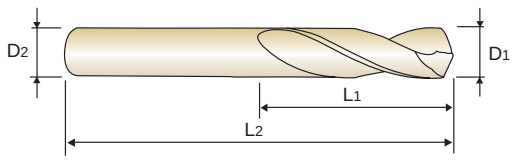
MULTI-1 DRILLS

CDRA06 SERIES

PREMIUM HSS-PM MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.



PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.109

▶ M16 / Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Wire gauge	Decimal			
TiAlN	D1		D2	L1	L2
M16045	45	.0820	1 / 8	3 / 4	2
M16044	44	.0860	1 / 8	3 / 4	2
M16043	43	.0890	1 / 8	3 / 4	2
M16042	42	.0935	1 / 8	3 / 4	2
M16041	41	.0960	1 / 8	13 / 16	2-1 / 16
M16040	40	.0980	1 / 8	13 / 16	2-1 / 16
M16039	39	.0995	1 / 8	13 / 16	2-1 / 4
M16038	38	.1015	1 / 8	13 / 16	2-1 / 4
M16037	37	.1040	1 / 8	13 / 16	2-1 / 4
M16036	36	.1065	1 / 8	13 / 16	2-1 / 4
M16035	35	.1100	1 / 8	7 / 8	2-5 / 16
M16034	34	.1110	1 / 8	7 / 8	2-5 / 16
M16033	33	.1130	1 / 8	7 / 8	2-5 / 16
M16032	32	.1160	1 / 8	7 / 8	2-5 / 16
M16031	31	.1120	1 / 8	7 / 8	2-5 / 16
M16030	30	.1285	3 / 16	15 / 16	2-3 / 8
M16029	29	.1360	3 / 16	15 / 16	2-3 / 8
M16028	28	.1405	3 / 16	15 / 16	2-3 / 8
M16027	27	.1440	3 / 16	1	2-7 / 16
M16026	26	.1470	3 / 16	1	2-7 / 16
M16025	25	.1495	3 / 16	1	2-7 / 16
M16024	24	.1520	3 / 16	1	2-7 / 16
M16023	23	.1540	3 / 16	1	2-7 / 16

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Wire gauge	Decimal			
TiAlN	D1		D2	L1	L2
M16022	22	.1570	3 / 16	1-1 / 16	2-1 / 2
M16021	21	.1590	3 / 16	1-1 / 16	2-1 / 2
M16020	20	.1610	3 / 16	1-1 / 16	2-1 / 2
M16019	19	.1660	3 / 16	1-1 / 16	2-1 / 2
M16018	18	.1695	3 / 16	1-1 / 16	2-1 / 2
M16017	17	.1730	3 / 16	1-1 / 8	2-9 / 16
M16016	16	.1770	3 / 16	1-1 / 8	2-9 / 16
M16015	15	.1800	3 / 16	1-1 / 8	2-9 / 16
M16014	14	.1820	3 / 16	1-1 / 8	2-9 / 16
M16013	13	.1850	3 / 16	1-1 / 8	2-9 / 16
M16012	12	.1890	1 / 4	1-3 / 16	3
M16011	11	.1910	1 / 4	1-3 / 16	3
M16010	10	.1935	1 / 4	1-3 / 16	3
M16009	9	.1960	1 / 4	1-3 / 16	3
M16008	8	.1990	1 / 4	1-3 / 16	3
M16007	7	.2010	1 / 4	1-3 / 16	3
M16006	6	.2040	1 / 4	1-1 / 4	3-1 / 16
M16005	5	.2055	1 / 4	1-1 / 4	3-1 / 16
M16004	4	.2090	1 / 4	1-1 / 4	3-1 / 16
M16003	3	.2130	1 / 4	1-1 / 4	3-1 / 16
M16002	2	.2210	1 / 4	1-5 / 16	3-1 / 8
M16001	1	.2280	1 / 4	1-5 / 16	3-1 / 8

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	◎	◎		

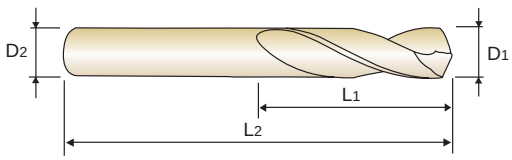
MULTI-1 DRILLS

CDRA07 SERIES

PREMIUM HSS-PM MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.



PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.109

▶ M17 / Letter sizes

Unit : Inch

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D_1		D_2	L_1	L_2
M1700B	**B**	**.2380**	1 / 4	1-3 / 8	3-3 / 16
M1700C	**C**	**.2420**	1 / 4	1-3 / 8	3-3 / 16
M1700D	**D**	**.2460**	1 / 4	1-3 / 8	3-3 / 16
M1700F	**F**	**.2570**	3 / 8	1-7 / 16	3-1 / 4
M1700G	**G**	**.2610**	3 / 8	1-7 / 16	3-1 / 4
M1700I	**I**	**.2720**	3 / 8	1-1 / 2	3-5 / 16
M1700J	**J**	**.2770**	3 / 8	1-1 / 2	3-5 / 16
M1700L	**L**	**.2900**	3 / 8	1-9 / 16	3-3 / 8
M1700M	**M**	**.2950**	3 / 8	1-9 / 16	3-3 / 8

EDP No.	Diameter		Shank Diameter	Flute Length	Overall Length
	Fractional	Decimal			
TiAlN	D_1		D_2	L_1	L_2
M1700N	**N**	**.3020**	3 / 8	1-5 / 8	3-7 / 16
M1700O	**O**	**.3160**	3 / 8	1-11 / 16	3-1 / 2
M1700Q	**Q**	**.3320**	3 / 8	1-11 / 16	3-1 / 2
M1700R	**R**	**.3390**	3 / 8	1-11 / 16	3-1 / 2
M1700U	**U**	**.3680**	3 / 8	1-13 / 16	3-5 / 8
M1700V	**V**	**.3770**	1 / 2	1-7 / 8	3-31 / 32
M1700X	**X**	**.3970**	1 / 2	1-15 / 16	4-1 / 32
M1700Y	**Y**	**.4040**	1 / 2	1-15 / 16	4-1 / 32
M1700Z	**Z**	**.4130**	1 / 2	2	4-1 / 32

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	◎	◎		

PREMIUM HSS-PM MULTI-1 DRILLS

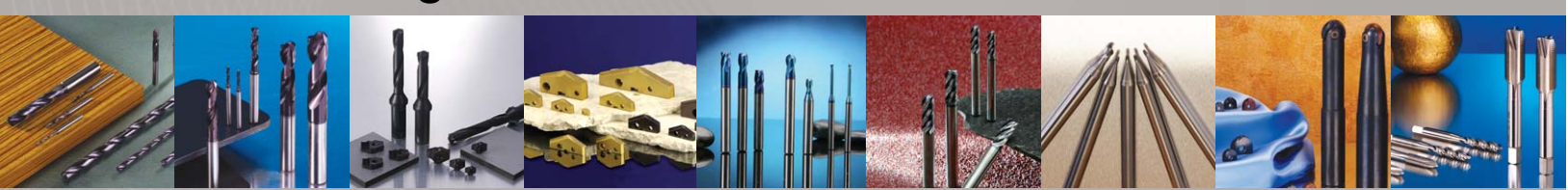
CDRA05, CDRA06, CDRA07 SERIES

WORK MATERIAL	STRUCTUAL STEEL CARBON STEEL			ALLOY STEEL			MOLD STEEL STAINLESS STEEL		
DIAMETER	RPM	FEED (IPR)	FEED (inch/min)	RPM	FEED (IPR)	FEED (inch/min)	RPM	FEED (IPR)	FEED (inch/min)
3/32	5000	.0030	15.00	4000	.0030	12.00	1800	.0030	5.40
1/8	3800	.0050	19.00	3000	.0040	12.00	1400	.0040	5.60
5/32	3000	.0060	18.00	2400	.0050	12.00	1100	.0040	4.40
3/16	2500	.0070	17.50	2000	.0050	10.00	900	.0040	3.60
1/4	1900	.0080	15.20	1500	.0070	10.50	700	.0050	3.50
5/16	1500	.0090	13.50	1200	.0080	9.60	550	.0070	3.85
3/8	1250	.0100	12.50	1000	.0090	9.00	450	.0080	3.60
1/2	950	.0110	10.45	750	.0100	7.50	350	.0090	3.15

WORK MATERIAL	NICKEL ALLOY TITANIUM ALLOY			CAST IRON			ALUMINIUM ALLOY COPPER ALLOY NONFERROUS ALLOY		
DIAMETER	RPM	FEED (IPR)	FEED (inch/min)	RPM	FEED (IPR)	FEED (inch/min)	RPM	FEED (IPR)	FEED (inch/min)
3/32	800	.0010	0.80	5700	.0040	22.80	8700	.0040	34.80
1/8	600	.0020	1.20	4250	.0060	25.50	6500	.0060	39.00
5/32	500	.0020	1.00	3400	.0070	23.80	5200	.0070	36.40
3/16	400	.0020	0.80	2850	.0080	22.80	4300	.0080	34.40
1/4	300	.0030	0.90	2100	.0100	21.00	3200	.0090	28.80
5/16	250	.0030	0.75	1750	.0120	21.00	2600	.0110	28.60
3/8	200	.0040	0.80	1450	.0120	17.40	2200	.0130	28.60
1/2	150	.0050	0.75	1100	.0150	16.50	1650	.0150	24.75

N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation

HPD DRILLS

- **HSS-EX HPD STRAIGHT SHANK DRILLS for Stainless Steels**

HPD - HIGH PERFORMANCE DRILLS

HPD-SUS Drills for High precision drilling in Stainless steels

◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	
◎						○	◎	○	○	○	

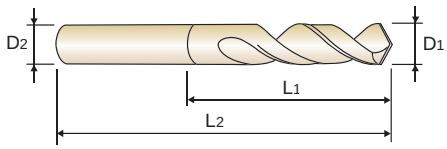
HPD DRILLS

DJ543 SERIES

HSS-EX, HPD-SUS DRILLS

STUB

▶ **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶ **Advantage** : Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling
▶ **Plain Shank** : DIN6535-HA



HSS EX | W 38° | h7 | h8 | 130° | 120° | P.119

up to 4mm over 4mm

$D_1=D_2$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length	EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch				Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2	TiN	$D_1 = D_2$		L_1	L_2
0201JCN	2.0	.0787	12	44	0481JCN	4.8	.1890	26	70
0211JCN	2.1	.0827	12	44	0491JCN	4.9	.1929	26	70
0221JCN	2.2	.0866	13	45	0501JCN	5.0	.1969	26	70
0231JCN	2.3	.0906	13	45	0511JCN	5.1	.2008	26	70
0241JCN	2.4	.0945	14	46	0521JCN	5.2	.2047	26	70
0251JCN	2.5	.0984	14	46	0531JCN	5.3	.2087	26	70
0261JCN	2.6	.1024	14	46	0541JCN	5.4	.2126	28	72
0271JCN	2.7	.1063	16	48	0551JCN	5.5	.2165	28	72
0281JCN	2.8	.1102	16	48	0561JCN	5.6	.2205	28	72
0291JCN	2.9	.1142	16	48	0571JCN	5.7	.2244	28	72
0301JCN	3.0	.1181	16	48	0581JCN	5.8	.2283	28	72
0311JCN	3.1	.1220	18	50	0591JCN	5.9	.2323	28	72
0321JCN	3.2	.1260	18	50	0601JCN	6.0	.2362	28	72
0331JCN	3.3	.1299	18	50	0611JCN	6.1	.2402	31	75
0341JCN	3.4	.1339	20	52	0621JCN	6.2	.2441	31	75
0351JCN	3.5	.1378	20	52	0631JCN	6.3	.2480	31	75
0361JCN	3.6	.1417	20	52	0641JCN	6.4	.2520	31	75
0371JCN	3.7	.1457	20	52	0651JCN	6.5	.2559	31	75
0381JCN	3.8	.1496	22	54	0661JCN	6.6	.2598	31	75
0391JCN	3.9	.1535	22	54	0671JCN	6.7	.2638	31	75
0401JCN	4.0	.1575	22	54	0681JCN	6.8	.2677	34	78
0411JCN	4.1	.1614	22	66	0691JCN	6.9	.2717	34	78
0421JCN	4.2	.1654	22	66	0701JCN	7.0	.2756	34	78
0431JCN	4.3	.1693	24	68	0711JCN	7.1	.2795	34	78
0441JCN	4.4	.1732	24	68	0721JCN	7.2	.2835	34	78
0451JCN	4.5	.1772	24	68	0731JCN	7.3	.2874	34	78
0461JCN	4.6	.1811	24	68	0741JCN	7.4	.2913	34	78
0471JCN	4.7	.1850	24	68	0751JCN	7.5	.2953	34	78

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	

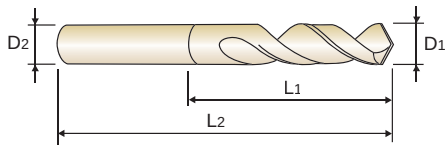
HSS-EX, HPD-SUS DRILLS

STUB

▶ **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶ **Advantage** : Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Plain Shank** : DIN6535-HA

four facet



HSS EX | W 38° | h7 | h8 | 130° | 120°

up to 4mm over 4mm

P.119

$D_1 = D_2$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length	EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch				Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2	TiN	$D_1 = D_2$		L_1	L_2
0761JCN	**7.6**	**.2992**	37	81	**1041JCN**	**10.4**	**.4094**	43	100
0771JCN	**7.7**	**.3031**	37	81	**1051JCN**	**10.5**	**.4134**	43	100
0781JCN	**7.8**	**.3071**	37	81	**1061JCN**	**10.6**	**.4173**	43	100
0791JCN	**7.9**	**.3110**	37	81	**1071JCN**	**10.7**	**.4212**	47	104
0801JCN	**8.0**	**.3150**	37	81	**1081JCN**	**10.8**	**.4252**	47	104
0811JCN	**8.1**	**.3189**	37	87	**1091JCN**	**10.9**	**.4291**	47	104
0821JCN	**8.2**	**.3228**	37	87	**1101JCN**	**11.0**	**.4330**	47	104
0831JCN	**8.3**	**.3268**	37	87	**1111JCN**	**11.1**	**.4370**	47	104
0841JCN	**8.4**	**.3307**	37	87	**1121JCN**	**11.2**	**.4409**	47	104
0851JCN	**8.5**	**.3346**	37	87	**1131JCN**	**11.3**	**.4448**	47	104
0861JCN	**8.6**	**.3386**	40	90	**1141JCN**	**11.4**	**.4488**	47	104
0871JCN	**8.7**	**.3425**	40	90	**1151JCN**	**11.5**	**.4527**	47	104
0881JCN	**8.8**	**.3465**	40	90	**1161JCN**	**11.6**	**.4566**	47	104
0891JCN	**8.9**	**.3504**	40	90	**1171JCN**	**11.7**	**.4606**	47	104
0901JCN	**9.0**	**.3543**	40	90	**1181JCN**	**11.8**	**.4645**	47	104
0911JCN	**9.1**	**.3583**	40	90	**1191JCN**	**11.9**	**.4685**	51	108
0921JCN	**9.2**	**.3622**	40	90	**1201JCN**	**12.0**	**.4724**	51	108
0931JCN	**9.3**	**.3661**	40	90	**1211JCN**	**12.1**	**.4764**	51	108
0941JCN	**9.4**	**.3701**	40	90	**1221JCN**	**12.2**	**.4803**	51	108
0951JCN	**9.5**	**.3740**	40	90	**1231JCN**	**12.3**	**.4843**	51	108
0961JCN	**9.6**	**.3780**	43	93	**1241JCN**	**12.4**	**.4882**	51	108
0971JCN	**9.7**	**.3819**	43	93	**1251JCN**	**12.5**	**.4921**	51	108
0981JCN	**9.8**	**.3858**	43	93	**1261JCN**	**12.6**	**.4961**	51	108
0991JCN	**9.9**	**.3898**	43	93	**1271JCN**	**12.7**	**.5000**	51	108
1001JCN	**10.0**	**.3937**	43	93	**1281JCN**	**12.8**	**.5039**	51	108
1011JCN	**10.1**	**.3976**	43	100	**1291JCN**	**12.9**	**.5079**	51	108
1021JCN	**10.2**	**.4016**	43	100	**1301JCN**	**13.0**	**.5118**	51	108
1031JCN	**10.3**	**.4055**	43	100					

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	

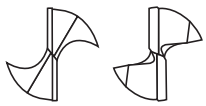
HPD DRILLS

DJ544 SERIES

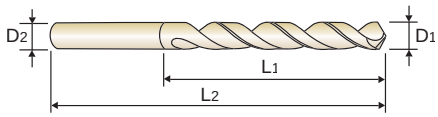
HSS-EX, HPD-SUS DRILLS

JOBBER

▶**Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.



up to 13mm over 13mm



HSS EX | W 38° | h7 | h8 | 130° | 120° | P.119

up to 4mm over 4mm

$D_1 = D_2$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2
0201KCN	2.0	.0787	24	56
0211KCN	2.1	.0827	24	56
0221KCN	2.2	.0866	27	59
0231KCN	2.3	.0906	27	59
0241KCN	2.4	.0945	30	62
0251KCN	2.5	.0984	30	62
0261KCN	2.6	.1024	30	62
0271KCN	2.7	.1063	33	65
0281KCN	2.8	.1102	33	65
0291KCN	2.9	.1142	33	65
0301KCN	3.0	.1181	33	65
0311KCN	3.1	.1220	36	68
0321KCN	3.2	.1260	36	68
0331KCN	3.3	.1299	36	68
0341KCN	3.4	.1339	39	71
0351KCN	3.5	.1378	39	71
0361KCN	3.6	.1417	39	71
0371KCN	3.7	.1457	39	71
0381KCN	3.8	.1496	43	75
0391KCN	3.9	.1535	43	75
0401KCN	4.0	.1575	43	75
0411KCN	4.1	.1614	43	87
0421KCN	4.2	.1654	43	87
0431KCN	4.3	.1693	47	91
0441KCN	4.4	.1732	47	91

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2
0451KCN	4.5	.1772	47	91
0461KCN	4.6	.1811	47	91
0471KCN	4.7	.1850	47	91
0481KCN	4.8	.1890	52	96
0491KCN	4.9	.1929	52	96
0501KCN	5.0	.1969	52	96
0511KCN	5.1	.2008	52	96
0521KCN	5.2	.2047	52	96
0531KCN	5.3	.2087	52	96
0541KCN	5.4	.2126	57	101
0551KCN	5.5	.2165	57	101
0561KCN	5.6	.2205	57	101
0571KCN	5.7	.2244	57	101
0581KCN	5.8	.2283	57	101
0591KCN	5.9	.2323	57	101
0601KCN	6.0	.2362	57	101
0611KCN	6.1	.2402	63	107
0621KCN	6.2	.2441	63	107
0631KCN	6.3	.2480	63	107
0641KCN	6.4	.2520	63	107
0651KCN	6.5	.2559	63	107
0661KCN	6.6	.2598	63	107
0671KCN	6.7	.2638	63	107
0681KCN	6.8	.2677	69	113
0691KCN	6.9	.2717	69	113

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	

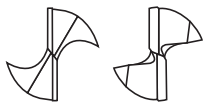
HPD DRILLS

DJ544 SERIES

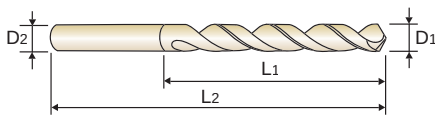
HSS-EX, HPD-SUS DRILLS

JOBBER

▶**Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.



up to 13mm over 13mm



HSS EX | W 38° | h7 | h8 | 130° | 120° | P.119

up to 4mm over 4mm

$D_1 = D_2$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length	EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch				Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2	TiN	$D_1 = D_2$		L_1	L_2
0701KCN	**7.0**	**.2756**	69	113	**0951KCN**	**9.5**	**.3740**	81	131
0711KCN	**7.1**	**.2795**	69	113	**0961KCN**	**9.6**	**.3780**	87	137
0721KCN	**7.2**	**.2835**	69	113	**0971KCN**	**9.7**	**.3819**	87	137
0731KCN	**7.3**	**.2874**	69	113	**0981KCN**	**9.8**	**.3858**	87	137
0741KCN	**7.4**	**.2913**	69	113	**0991KCN**	**9.9**	**.3898**	87	137
0751KCN	**7.5**	**.2953**	69	113	**1001KCN**	**10.0**	**.3937**	87	137
0761KCN	**7.6**	**.2992**	75	119	**1011KCN**	**10.1**	**.3976**	87	144
0771KCN	**7.7**	**.3031**	75	119	**1021KCN**	**10.2**	**.4016**	87	144
0781KCN	**7.8**	**.3071**	75	119	**1031KCN**	**10.3**	**.4055**	87	144
0791KCN	**7.9**	**.3110**	75	119	**1041KCN**	**10.4**	**.4094**	87	144
0801KCN	**8.0**	**.3150**	75	119	**1051KCN**	**10.5**	**.4134**	87	144
0811KCN	**8.1**	**.3189**	75	125	**1061KCN**	**10.6**	**.4173**	87	144
0821KCN	**8.2**	**.3228**	75	125	**1071KCN**	**10.7**	**.4212**	94	151
0831KCN	**8.3**	**.3268**	75	125	**1081KCN**	**10.8**	**.4252**	94	151
0841KCN	**8.4**	**.3307**	75	125	**1091KCN**	**10.9**	**.4291**	94	151
0851KCN	**8.5**	**.3346**	75	125	**1101KCN**	**11.0**	**.4330**	94	151
0861KCN	**8.6**	**.3386**	81	131	**1111KCN**	**11.1**	**.4370**	94	151
0871KCN	**8.7**	**.3425**	81	131	**1121KCN**	**11.2**	**.4409**	94	151
0881KCN	**8.8**	**.3465**	81	131	**1131KCN**	**11.3**	**.4448**	94	151
0891KCN	**8.9**	**.3504**	81	131	**1141KCN**	**11.4**	**.4488**	94	151
0901KCN	**9.0**	**.3543**	81	131	**1151KCN**	**11.5**	**.4527**	94	151
0911KCN	**9.1**	**.3583**	81	131	**1161KCN**	**11.6**	**.4566**	94	151
0921KCN	**9.2**	**.3622**	81	131	**1171KCN**	**11.7**	**.4606**	94	151
0931KCN	**9.3**	**.3661**	81	131	**1181KCN**	**11.8**	**.4645**	94	151
0941KCN	**9.4**	**.3701**	81	131	**1191KCN**	**11.9**	**.4685**	101	158

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	

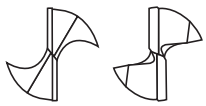
HPD DRILLS

DJ544 SERIES

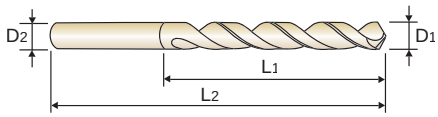
HSS-EX, HPD-SUS DRILLS

JOBBER

▶**Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.



up to 13mm over 13mm



HSS EX | W 38° | h7 | h8 | 130° | 120° | P.119

up to 4mm over 4mm

$D_1 = D_2$

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2
1201KCN	**12.0**	**.4724**	101	158
1211KCN	**12.1**	**.4764**	101	158
1221KCN	**12.2**	**.4803**	101	158
1231KCN	**12.3**	**.4843**	101	158
1241KCN	**12.4**	**.4882**	101	158
1251KCN	**12.5**	**.4921**	101	158
1261KCN	**12.6**	**.4961**	101	158
1271KCN	**12.7**	**.5000**	101	158
1281KCN	**12.8**	**.5039**	101	158
1291KCN	**12.9**	**.5079**	101	158
1301KCN	**13.0**	**.5118**	101	158
1351KCN	**13.5**	**.5314**	106	166
1401KCN	**14.0**	**.5512**	106	166
1411KCN	**14.1**	**.5551**	109	169
1451KCN	**14.5**	**.5708**	109	169

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	$D_1 = D_2$		L_1	L_2
1501KCN	**15.0**	**.5905**	109	169
1551KCN	**15.5**	**.6102**	112	172
1561KCN	**15.6**	**.6141**	112	172
1601KCN	**16.0**	**.6299**	112	172
1651KCN	**16.5**	**.6495**	115	181
1701KCN	**17.0**	**.6692**	115	181
1751KCN	**17.5**	**.6889**	118	184
1761KCN	**17.6**	**.6929**	118	184
1801KCN	**18.0**	**.7087**	118	184
1851KCN	**18.5**	**.7283**	122	188
1901KCN	**19.0**	**.7480**	122	188
1951KCN	**19.5**	**.7676**	125	191
1961KCN	**19.6**	**.7716**	125	191
2001KCN	**20.0**	**.7874**	125	191

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎						○	◎	○	○	○	

HSS-EX, HPD-SUS TWIST DRILLS SPEED and FEED DATA

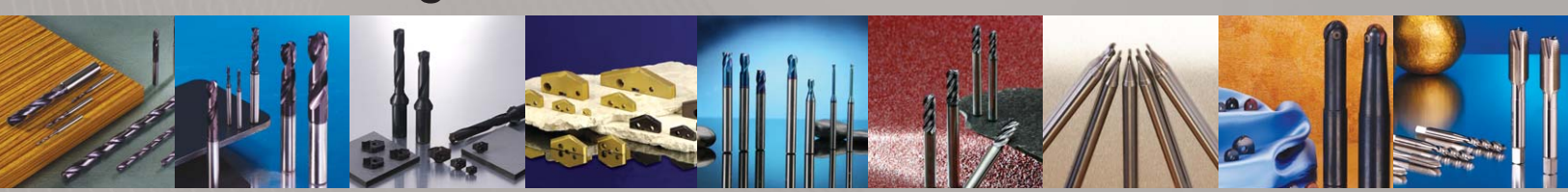
DJ543, DJ544 SERIES

Please decrease the feed rate 15% in JOBBERS SERIES.
Please decrease the feed and speed 20% for cast surface.

WORK MATERIAL	STAINLESS STEELS (SUS304, 200)		STAINLESS STEELS (SUS420, 440)		ALUMINUM & ALUMINUM ALLOY		PLASTICS, COPPER, COPPER ALLOYS		MILD STEELS, LOW CARBON STEELS	
DIAMETER	N	S	N	S	N	S	N	S	N	S
2.0	2600	0.003	3100	0.003	11000	0.004	5600	0.002	6300	0.003
3.0	1800	0.003	2100	0.003	7350	0.005	3750	0.003	4200	0.005
4.0	1300	0.004	1600	0.004	7050	0.007	2800	0.004	3200	0.006
5.0	1050	0.006	1250	0.006	5500	0.009	2250	0.005	2500	0.006
6.0	900	0.007	1050	0.007	4600	0.010	1850	0.006	2100	0.007
8.0	650	0.009	800	0.009	3500	0.013	1350	0.008	1550	0.009
10.0	550	0.010	630	0.012	2800	0.016	1100	0.010	1250	0.010
12.0	450	0.013	530	0.014	2300	0.020	950	0.012	1050	0.013
14.0	400	0.014	450	0.017	2050	0.022	800	0.013	900	0.014
16.0	350	0.016	390	0.019	1750	0.024	700	0.014	790	0.016
18.0	300	0.017	350	0.020	1600	0.028	620	0.016	700	0.018
20.0	260	0.018	320	0.021	1450	0.030	560	0.016	620	0.019

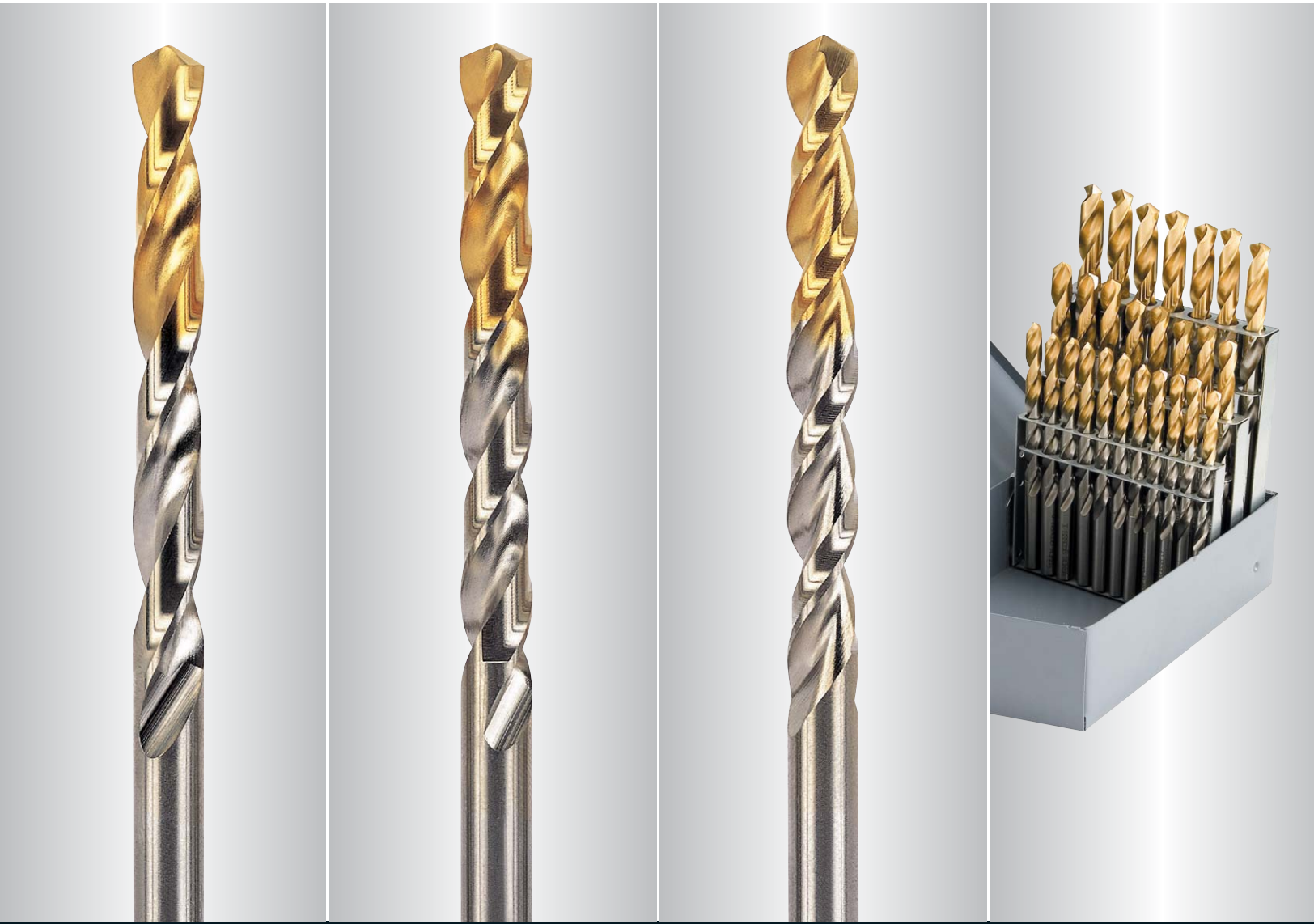
N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation



GOLD-P DRILLS

- GOLD-P COATING

GOLD-P DRILLS (GOLD-P COATED)

Competitive price and same performance as full TiN coating

ITEM	MODEL	DESCRIPTION		SIZE MIN	SIZE MAX	PAGE
INCH						
D1GP182 D8182		HSS, STRAIGHT SHANK, GOLD-P COATED / Fractional sizes	*JOBBER*	D3/64	D3/4	124
D1GP139		HSS, STRAIGHT SHANK, GOLD-P COATED / Letter sizes	*JOBBER*	A	Z	125
D1GP138		HSS, STRAIGHT SHANK, GOLD-P COATED / Wire gauge sizes	*JOBBER*	#56	#1	126
D2GP185		HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Fractional sizes	*JOBBER*	D3/64	D1/2	127
D2GP186		HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Letter sizes	*JOBBER*	A	Z	128
D2GP187		HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Wire gauge sizes	*JOBBER*	#56	#1	129
DLGP511		HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Fractional sizes	*JOBBER*	D5/64	D1/2	130
DLGP513		HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Letter sizes	*JOBBER*	A	Z	131
DLGP512		HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Wire gauge sizes	*JOBBER*	#47	#1	132
METRIC						
DLGP195		HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED	*JOBBER*	D1.0	D13.0	133
DLGP506		HSSCo5 DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED	*JOBBER*	D2.0	D13.0	135
		RECOMMENDED CUTTING CONDITIONS				138

◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
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◎	◎					○	○	○	○		
◎	◎				○	○			○		

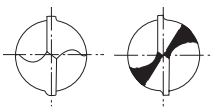
GOLD-P DRILLS

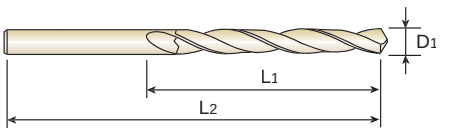
D1GP182 SERIES
D8182 SERIES

HSS, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135˚
under 1/16 : Normal point
1/16 & over : Split point
▶**Surface treatment** : Bright body TiN coating on working part
over TiN coating on flute length
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI HSS N ≈30° h8 135° P.138

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional D1	Diameter Decimal D1	Flute Length L1	Overall Length L2
* D1GP113003	3/64	.0469	3/4	1-3/4
* D1GP182004	1/16	.0625	7/8	1-7/8
* D1GP182005	5/64	.0781	1	2
* D1GP182006	3/32	.0938	1-1/4	2-1/4
* D1GP182007	7/64	.1094	1-1/2	2-5/8
* D1GP182008	1/8	.1250	1-5/8	2-3/4
* D1GP182009	9/64	.1406	1-3/4	2-7/8
* D1GP182010	5/32	.1563	2	3-1/8
* D1GP182011	11/64	.1719	2-1/8	3-1/4
* D1GP182012	3/16	.1875	2-5/16	3-1/2
* D1GP182013	13/64	.2031	2-7/16	3-5/8
* D1GP182014	7/32	.2188	2-1/2	3-3/4
* D1GP182015	15/64	.2344	2-5/8	3-7/8
* D1GP182016	1/4	.2500	2-3/4	4
* D1GP182017	17/64	.2656	2-7/8	4-1/8
* D1GP182018	9/32	.2813	2-15/16	4-1/4
* D1GP182019	19/64	.2969	3-1/16	4-3/8
* D1GP182020	5/16	.3125	3-3/16	4-1/2
** D1GP182021	21/64	.3281	3-5/16	4-5/8
** D1GP182022	11/32	.3438	3-7/16	4-3/4
** D1GP182023	23/64	.3594	3-1/2	4-7/8
** D1GP182024	3/8	.3750	3-5/8	5
** D1GP182025	25/64	.3906	3-3/4	5-1/8
** D1GP182026	13/32	.4063	3-7/8	5-1/4
** D1GP182027	27/64	.4219	3-15/16	5-3/8
** D1GP182028	7/16	.4375	4-1/16	5-1/2
** D1GP182029	29/64	.4531	4-3/16	5-5/8
** D1GP182030	15/32	.4688	4-5/16	5-3/4
** D1GP182031	31/64	.4844	4-3/8	5-7/8
** D1GP182032	1/2	.5000	4-1/2	6
** D8182033	33/64	.5156	4-13/16	6-5/8
** D8182034	17/32	.5312	4-13/16	6-5/8
** D8182035	35/64	.5469	4-13/16	6-5/8
** D8182036	9/16	.5625	4-13/16	6-5/8
** D8182037	37/64	.5781	4-13/16	6-5/8
⁂ D8182038	19/32	.5937	5-3/16	7-1/8
⁂ D8182039	39/64	.6094	5-3/16	7-1/8
⁂ D8182040	5/8	.6250	5-3/16	7-1/8
⁂ D8182042	21/32	.6563	5-3/16	7-1/8
⁂ D8182044	11/16	.6875	5-5/8	7-5/8
⁂ D8182045	45/64	.7031	5-5/8	9-1/2
⁂ D8182046	23/32	.7188	5-5/8	9-1/2
⁂ D8182047	47/64	.7344	5-5/8	9-3/4
⁂ D8182048	3/4	.7500	5-7/8	9-3/4

* 10per package
** 5per package
⁂ 3per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

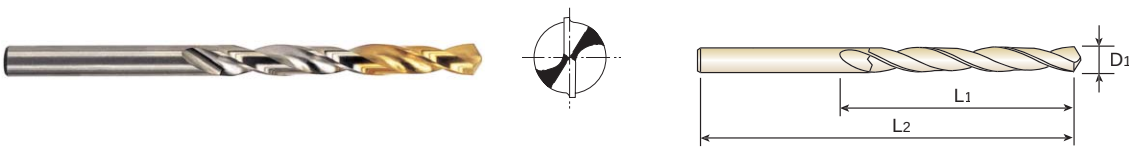
GOLD-P DRILLS

D1GP139 SERIES

HSS, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135°:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron



ANSI HSS N ≈30° h8 135° P.138

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1GP139101	A	.2340	2-5 / 8	3-7 / 8
* D1GP139102	B	.2380	2-3 / 4	4
* D1GP139103	C	.2420	2-3 / 4	4
* D1GP139104	D	.2460	2-3 / 4	4
* D1GP139105	E	.2500	2-3 / 4	4
* D1GP139106	F	.2570	2-7 / 8	4-1 / 8
* D1GP139107	G	.2610	2-7 / 8	4-1 / 8
* D1GP139108	H	.2660	2-7 / 8	4-1 / 8
* D1GP139109	I	.2720	2-7 / 8	4-1 / 8
* D1GP139110	J	.2770	2-7 / 8	4-1 / 8
* D1GP139111	K	.2810	2-15 / 16	4-1 / 4
* D1GP139112	L	.2900	2-15 / 16	4-1 / 4
* D1GP139113	M	.2950	3-1 / 16	4-3 / 8

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1GP139114	N	.3020	3-1 / 16	4-3 / 8
* D1GP139115	O	.3160	3-3 / 16	4-1 / 2
* D1GP139116	P	.3230	3-5 / 16	4-5 / 8
** D1GP139117	Q	.3320	3-7 / 16	4-3 / 4
** D1GP139118	R	.3390	3-7 / 16	4-3 / 4
** D1GP139119	S	.3480	3-1 / 2	4-7 / 8
** D1GP139120	T	.3580	3-1 / 2	4-7 / 8
** D1GP139121	U	.3680	3-5 / 8	5
** D1GP139122	V	.3770	3-5 / 8	5
** D1GP139123	W	.3860	3-3 / 4	5-1 / 8
** D1GP139124	X	.3970	3-3 / 4	5-1 / 8
** D1GP139125	Y	.4040	3-7 / 8	5-1 / 4
** D1GP139126	Z	.4130	3-7 / 8	5-1 / 4

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

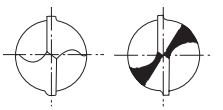
GOLD-P DRILLS

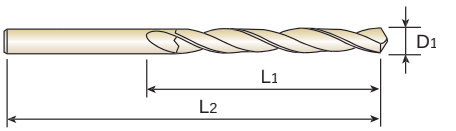
D1GP138 SERIES

HSS, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135°, Split point
Wire gauge size #53~#56:Normal point
Wire gauge size #1~#52:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI | HSS | N 30° | h8 | 135° | 118° | P.138

#53~#56 #1~#52

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* D1GP138256	1	.2280	2-5 / 8	3-7 / 8
* D1GP138255	2	.2210	2-5 / 8	3-7 / 8
* D1GP138254	3	.2130	2-1 / 2	3-3 / 4
* D1GP138253	4	.2090	2-1 / 2	3-3 / 4
* D1GP138252	5	.2055	2-1 / 2	3-3 / 4
* D1GP138251	6	.2040	2-1 / 2	3-3 / 4
* D1GP138250	7	.2010	2-7 / 16	3-5 / 8
* D1GP138249	8	.1990	2-7 / 16	3-5 / 8
* D1GP138248	9	.1960	2-7 / 16	3-5 / 8
* D1GP138247	10	.1935	2-7 / 16	3-5 / 8
* D1GP138246	11	.1910	2-5 / 16	3-1 / 2
* D1GP138245	12	.1890	2-5 / 16	3-1 / 2
* D1GP138244	13	.1850	2-5 / 16	3-1 / 2
* D1GP138243	14	.1820	2-3 / 16	3-3 / 8
* D1GP138242	15	.1800	2-3 / 16	3-3 / 8
* D1GP138241	16	.1770	2-3 / 16	3-3 / 8
* D1GP138240	17	.1730	2-3 / 16	3-3 / 8
* D1GP138239	18	.1695	2-1 / 8	3-1 / 4
* D1GP138238	19	.1660	2-1 / 8	3-1 / 4
* D1GP138237	20	.1610	2-1 / 8	3-1 / 4
* D1GP138236	21	.1590	2-1 / 8	3-1 / 4
* D1GP138235	22	.1570	2	3-1 / 8
* D1GP138234	23	.1540	2	3-1 / 8
* D1GP138233	24	.1520	2	3-1 / 8
* D1GP138232	25	.1495	1-7 / 8	3
* D1GP138231	26	.1470	1-7 / 8	3
* D1GP138230	27	.1440	1-7 / 8	3
* D1GP138229	28	.1405	1-3 / 4	2-7 / 8

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* D1GP138228	29	.1360	1-3 / 4	2-7 / 8
* D1GP138227	30	.1285	1-5 / 8	2-3 / 4
* D1GP138226	31	.1200	1-5 / 8	2-3 / 4
* D1GP138225	32	.1160	1-5 / 8	2-3 / 4
* D1GP138224	33	.1130	1-1 / 2	2-5 / 8
* D1GP138223	34	.1110	1-1 / 2	2-5 / 8
* D1GP138222	35	.1100	1-1 / 2	2-5 / 8
* D1GP138221	36	.1065	1-7 / 16	2-1 / 2
* D1GP138220	37	.1040	1-7 / 16	2-1 / 2
* D1GP138219	38	.1015	1-7 / 16	2-1 / 2
* D1GP138218	39	.0995	1-3 / 8	2-3 / 8
* D1GP138217	40	.0980	1-3 / 8	2-3 / 8
* D1GP138216	41	.0960	1-3 / 8	2-3 / 8
* D1GP138215	42	.0935	1-1 / 4	2-1 / 4
* D1GP138214	43	.0890	1-1 / 4	2-1 / 4
* D1GP138213	44	.0860	1-1 / 8	2-1 / 8
* D1GP138212	45	.0820	1-1 / 8	2-1 / 8
* D1GP138211	46	.0810	1-1 / 8	2-1 / 8
* D1GP138210	47	.0785	1	2
* D1GP138209	48	.0760	1	2
* D1GP138208	49	.0730	1	2
* D1GP138207	50	.0700	1	2
* D1GP138206	51	.0670	1	2
* D1GP138205	52	.0635	7 / 8	1-7 / 8
* D1GP134204	53	.0595	7 / 8	1-7 / 8
* D1GP134203	54	.0550	7 / 8	1-7 / 8
* D1GP134202	55	.0520	7 / 8	1-7 / 8
* D1GP134201	56	.0465	3 / 4	1-3 / 4

▶**Tolerance** : See page 124

* 10per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

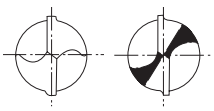
GOLD-P DRILLS

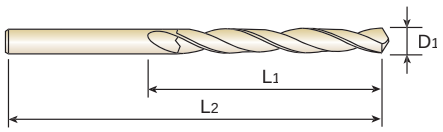
D2GP185 SERIES

HSSCo8, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135°
under 1/16 : Normal point
1/16 & over : Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI | HSS Co8 | N ≈30° | h8 | 135° P.138

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D2GP185003	3/64	.0469	3/4	1-3/4
* D2GP185004	1/16	.0625	7/8	1-7/8
* D2GP185005	5/64	.0781	1	2
* D2GP185006	3/32	.0938	1-1/4	2-1/4
* D2GP185007	7/64	.1094	1-1/2	2-5/8
* D2GP185008	1/8	.1250	1-5/8	2-3/4
* D2GP185009	9/64	.1406	1-3/4	2-7/8
* D2GP185010	5/32	.1563	2	3-1/8
* D2GP185011	11/64	.1719	2-1/8	3-1/4
* D2GP185012	3/16	.1875	2-5/16	3-1/2
* D2GP185013	13/64	.2031	2-7/16	3-5/8
* D2GP185014	7/32	.2188	2-1/2	3-3/4
* D2GP185015	15/64	.2344	2-5/8	3-7/8
* D2GP185016	1/4	.2500	2-3/4	4
* D2GP185017	17/64	.2656	2-7/8	4-1/8

EDP No.	Diameter Fractional	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D2GP185018	9/32	.2813	2-15/16	4-1/4
* D2GP185019	19/64	.2969	3-1/16	4-3/8
* D2GP185020	5/16	.3125	3-3/16	4-1/2
** D2GP185021	21/64	.3281	3-5/16	4-5/8
** D2GP185022	11/32	.3438	3-7/16	4-3/4
** D2GP185023	23/64	.3594	3-1/2	4-7/8
** D2GP185024	3/8	.3750	3-5/8	5
** D2GP185025	25/64	.3906	3-3/4	5-1/8
** D2GP185026	13/32	.4063	3-7/8	5-1/4
** D2GP185027	27/64	.4219	3-15/16	5-3/8
** D2GP185028	7/16	.4375	4-1/16	5-1/2
** D2GP185029	29/64	.4531	4-3/16	5-5/8
** D2GP185030	15/32	.4688	4-5/16	5-3/4
** D2GP185031	31/64	.4844	4-3/8	5-7/8
** D2GP185032	1/2	.5000	4-1/2	6

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

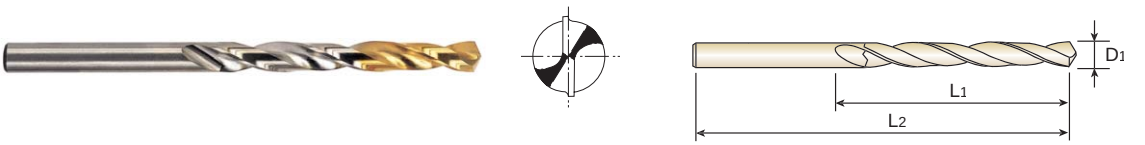
GOLD-P DRILLS

D2GP186 SERIES

HSSCo8, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135°:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron



ANSI | HSS Co8 | N ≈ 30° | h8 | 135° | P.138

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length L1	Overall Length L2
* D2GP186101	A	.2340	2-5 / 8	3-7 / 8
* D2GP186102	B	.2380	2-3 / 4	4
* D2GP186103	C	.2420	2-3 / 4	4
* D2GP186104	D	.2460	2-3 / 4	4
* D2GP185105	E	.2500	2-3 / 4	4
* D2GP186106	F	.2570	2-7 / 8	4-1 / 8
* D2GP186107	G	.2610	2-7 / 8	4-1 / 8
* D2GP186108	H	.2660	2-7 / 8	4-1 / 8
* D2GP186109	I	.2720	2-7 / 8	4-1 / 8
* D2GP186110	J	.2770	2-7 / 8	4-1 / 8
* D2GP186111	K	.2810	2-15 / 16	4-1 / 4
* D2GP186112	L	.2900	2-15 / 16	4-1 / 4
* D2GP186113	M	.2950	3-1 / 16	4-3 / 8

EDP No.	Diameter Letter	Diameter Decimal	Flute Length L1	Overall Length L2
* D2GP186114	N	.3020	3-1 / 16	4-3 / 8
* D2GP186115	O	.3160	3-3 / 16	4-1 / 2
* D2GP186116	P	.3230	3-5 / 16	4-5 / 8
** D2GP186117	Q	.3320	3-7 / 16	4-3 / 4
** D2GP186118	R	.3390	3-7 / 16	4-3 / 4
** D2GP186119	S	.3480	3-1 / 2	4-7 / 8
** D2GP186120	T	.3580	3-1 / 2	4-7 / 8
** D2GP186121	U	.3680	3-5 / 8	5
** D2GP186122	V	.3770	3-5 / 8	5
** D2GP186123	W	.3860	3-3 / 4	5-1 / 8
** D2GP186124	X	.3970	3-3 / 4	5-1 / 8
** D2GP186125	Y	.4040	3-7 / 8	5-1 / 4
** D2GP186126	Z	.4130	3-7 / 8	5-1 / 4

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

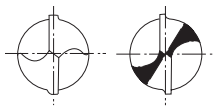
GOLD-P DRILLS

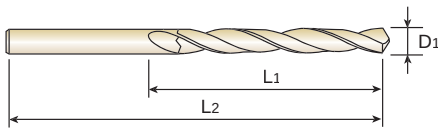
D2GP187 SERIES

HSSCo8, STRAIGHT SHANK, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix, wider flutes
▶**Point Angle** : 135°:Split point
Wire gauge size #53~#56:Normal point
Wire gauge size #1~#52:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI | HSS Co8 | N ≈30° | h8 | 135° P.138

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal		
	D1		L1	L2
* D2GP187256	1	.2280	2-5 / 8	3-7 / 8
* D2GP187255	2	.2210	2-5 / 8	3-7 / 8
* D2GP187254	3	.2130	2-1 / 2	3-3 / 4
* D2GP187253	4	.2090	2-1 / 2	3-3 / 4
* D2GP187252	5	.2055	2-1 / 2	3-3 / 4
* D2GP187251	6	.2040	2-1 / 2	3-3 / 4
* D2GP187250	7	.2010	2-7 / 16	3-5 / 8
* D2GP187249	8	.1990	2-7 / 16	3-5 / 8
* D2GP187248	9	.1960	2-7 / 16	3-5 / 8
* D2GP187247	10	.1935	2-7 / 16	3-5 / 8
* D2GP187246	11	.1910	2-5 / 16	3-1 / 2
* D2GP187245	12	.1890	2-5 / 16	3-1 / 2
* D2GP187244	13	.1850	2-5 / 16	3-1 / 2
* D2GP187243	14	.1820	2-3 / 16	3-3 / 8
* D2GP187242	15	.1800	2-3 / 16	3-3 / 8
* D2GP187241	16	.1770	2-3 / 16	3-3 / 8
* D2GP187240	17	.1730	2-3 / 16	3-3 / 8
* D2GP187239	18	.1695	2-1 / 8	3-1 / 4
* D2GP187238	19	.1660	2-1 / 8	3-1 / 4
* D2GP187237	20	.1610	2-1 / 8	3-1 / 4
* D2GP187236	21	.1590	2-1 / 8	3-1 / 4
* D2GP187235	22	.1570	2	3-1 / 8
* D2GP187234	23	.1540	2	3-1 / 8
* D2GP187233	24	.1520	2	3-1 / 8
* D2GP187232	25	.1495	1-7 / 8	3
* D2GP187231	26	.1470	1-7 / 8	3
* D2GP187230	27	.1440	1-7 / 8	3
* D2GP187229	28	.1405	1-3 / 4	2-7 / 8

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal		
	D1		L1	L2
* D2GP187228	29	.1360	1-3 / 4	2-7 / 8
* D2GP187227	30	.1285	1-5 / 8	2-3 / 4
* D2GP187226	31	.1200	1-5 / 8	2-3 / 4
* D2GP187225	32	.1160	1-5 / 8	2-3 / 4
* D2GP187224	33	.1130	1-1 / 2	2-5 / 8
* D2GP187223	34	.1110	1-1 / 2	2-5 / 8
* D2GP187222	35	.1100	1-1 / 2	2-5 / 8
* D2GP187221	36	.1065	1-7 / 16	2-1 / 2
* D2GP187220	37	.1040	1-7 / 16	2-1 / 2
* D2GP187219	38	.1015	1-7 / 16	2-1 / 2
* D2GP187218	39	.0995	1-3 / 8	2-3 / 8
* D2GP187217	40	.0980	1-3 / 8	2-3 / 8
* D2GP187216	41	.0960	1-3 / 8	2-3 / 8
* D2GP187215	42	.0935	1-1 / 4	2-1 / 4
* D2GP187214	43	.0890	1-1 / 4	2-1 / 4
* D2GP187213	44	.0860	1-1 / 8	2-1 / 8
* D2GP187212	45	.0820	1-1 / 8	2-1 / 8
* D2GP187211	46	.0810	1-1 / 8	2-1 / 8
* D2GP187210	47	.0785	1	2
* D2GP187209	48	.0760	1	2
* D2GP187208	49	.0730	1	2
* D2GP187207	50	.0700	1	2
* D2GP187206	51	.0670	1	2
* D2GP187205	52	.0635	7 / 8	1-7 / 8
* D2GP187204	53	.0595	7 / 8	1-7 / 8
* D2GP187203	54	.0550	7 / 8	1-7 / 8
* D2GP187202	55	.0520	7 / 8	1-7 / 8
* D2GP187201	56	.0465	3 / 4	1-3 / 4

▶ **Tolerance** : See page 124

* 10per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

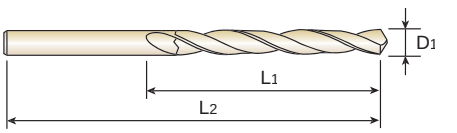
GOLD-P DRILLS

DLGP511 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
▶**Point Angle** : 130°:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI | HSS Co5 | N ≈ 38° | h8 | 130° P.139

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional D1	Diameter Decimal D1	Flute Length L1	Overall Length L2
* DLGP511005	5/64	.0781	1	2
* DLGP511006	3/32	.0938	1-1/4	2-1/4
* DLGP511007	7/64	.1094	1-1/2	2-5/8
* DLGP511008	1/8	.1250	1-5/8	2-3/4
* DLGP511009	9/64	.1406	1-3/4	2-7/8
* DLGP511010	5/32	.1563	2	3-1/8
* DLGP511011	11/64	.1719	2-1/8	3-1/4
* DLGP511012	3/16	.1875	2-5/16	3-1/2
* DLGP511013	13/64	.2031	2-7/16	3-5/8
* DLGP511014	7/32	.2188	2-1/2	3-3/4
* DLGP511015	15/64	.2344	2-5/8	3-7/8
* DLGP511016	1/4	.2500	2-3/4	4
* DLGP511017	17/64	.2656	2-7/8	4-1/8
* DLGP511018	9/32	.2813	2-15/16	4-1/4

EDP No.	Diameter Fractional D1	Diameter Decimal D1	Flute Length L1	Overall Length L2
* DLGP511019	19/64	.2969	3-1/16	4-3/8
* DLGP511020	5/16	.3125	3-3/16	4-1/2
** DLGP511021	21/64	.3281	3-5/16	4-5/8
** DLGP511022	11/32	.3438	3-7/16	4-3/4
** DLGP511023	23/64	.3594	3-1/2	4-7/8
** DLGP511024	3/8	.3750	3-5/8	5
** DLGP511025	25/64	.3906	3-3/4	5-1/8
** DLGP511026	13/32	.4063	3-7/8	5-1/4
** DLGP511027	27/64	.4219	3-15/16	5-3/8
** DLGP511028	7/16	.4375	4-1/16	5-1/2
** DLGP511029	29/64	.4531	4-3/16	5-5/8
** DLGP511030	15/32	.4688	4-5/16	5-3/4
** DLGP511031	31/64	.4844	4-3/8	5-7/8
** DLGP511032	1/2	.5000	4-1/2	6

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

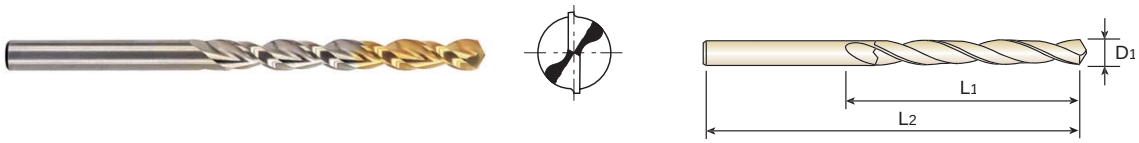
GOLD-P DRILLS

DLGP513 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
▶**Point Angle** : 130°:Split point
▶**Surface treatment** : Bright body TiN coating on working part
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI | HSS Co5 | N ≈ 38° | h8 | 130° | P.139

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* DLGP513101	A	.2340	2-5 / 8	3-7 / 8
* DLGP513102	B	.2380	2-3 / 4	4
* DLGP513103	C	.2420	2-3 / 4	4
* DLGP513104	D	.2460	2-3 / 4	4
* DLGP511105	E	.2500	2-3 / 4	4
* DLGP513106	F	.2570	2-7 / 8	4-1 / 8
* DLGP513107	G	.2610	2-7 / 8	4-1 / 8
* DLGP513108	H	.2660	2-7 / 8	4-1 / 8
* DLGP513109	I	.2720	2-7 / 8	4-1 / 8
* DLGP513110	J	.2770	2-7 / 8	4-1 / 8
* DLGP513111	K	.2810	2-15 / 16	4-1 / 4
* DLGP513112	L	.2900	2-15 / 16	4-1 / 4
* DLGP513113	M	.2950	3-1 / 16	4-3 / 8

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* DLGP513114	N	.3020	3-1 / 16	4-3 / 8
* DLGP513115	O	.3160	3-3 / 16	4-1 / 2
* DLGP513116	P	.3230	3-5 / 16	4-5 / 8
** DLGP513117	Q	.3320	3-7 / 16	4-3 / 4
** DLGP513118	R	.3390	3-7 / 16	4-3 / 4
** DLGP513119	S	.3480	3-1 / 2	4-7 / 8
** DLGP513120	T	.3580	3-1 / 2	4-7 / 8
** DLGP513121	U	.3680	3-5 / 8	5
** DLGP513122	V	.3770	3-5 / 8	5
** DLGP513123	W	.3860	3-3 / 4	5-1 / 8
** DLGP513124	X	.3970	3-3 / 4	5-1 / 8
** DLGP513125	Y	.4040	3-7 / 8	5-1 / 4
** DLGP513126	Z	.4130	3-7 / 8	5-1 / 4

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

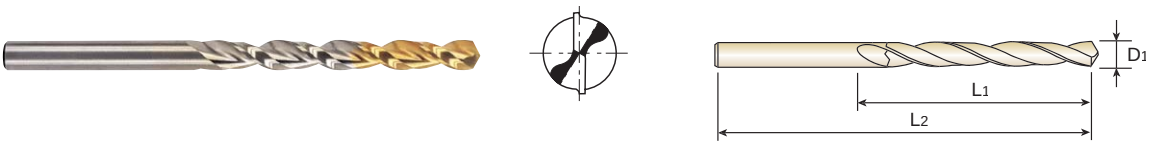
GOLD-P DRILLS

DLGP512 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

JOBBER

- ▶**Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
- ▶**Point Angle** : 130°:Split point
- ▶**Surface treatment** : Bright body TiN coating on working part
- ▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI | HSS Co5 | N 38° | h8 | 130° P.139

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* DLGP512247	1	.2280	2-5 / 8	3-7 / 8
* DLGP512246	2	.2210	2-5 / 8	3-7 / 8
* DLGP512245	3	.2130	2-1 / 2	3-3 / 4
* DLGP512244	4	.2090	2-1 / 2	3-3 / 4
* DLGP512243	5	.2055	2-1 / 2	3-3 / 4
* DLGP512242	6	.2040	2-1 / 2	3-3 / 4
* DLGP512241	7	.2010	2-7 / 16	3-5 / 8
* DLGP512240	8	.1990	2-7 / 16	3-5 / 8
* DLGP512239	9	.1960	2-7 / 16	3-5 / 8
* DLGP512238	10	.1935	2-7 / 16	3-5 / 8
* DLGP512237	11	.1910	2-5 / 16	3-1 / 2
* DLGP512236	12	.1890	2-5 / 16	3-1 / 2
* DLGP512235	13	.1850	2-5 / 16	3-1 / 2
* DLGP512234	14	.1820	2-3 / 16	3-3 / 8
* DLGP512233	15	.1800	2-3 / 16	3-3 / 8
* DLGP512232	16	.1770	2-3 / 16	3-3 / 8
* DLGP512231	17	.1730	2-3 / 16	3-3 / 8
* DLGP512230	18	.1695	2-1 / 8	3-1 / 4
* DLGP512229	19	.1660	2-1 / 8	3-1 / 4
* DLGP512228	20	.1610	2-1 / 8	3-1 / 4
* DLGP512227	21	.1590	2-1 / 8	3-1 / 4
* DLGP512226	22	.1570	2	3-1 / 8
* DLGP512225	23	.1540	2	3-1 / 8
* DLGP512224	24	.1520	2	3-1 / 8

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* DLGP512223	25	.1495	1-7 / 8	3
* DLGP512222	26	.1470	1-7 / 8	3
* DLGP512221	27	.1440	1-7 / 8	3
* DLGP512220	28	.1405	1-3 / 4	2-7 / 8
* DLGP512219	29	.1360	1-3 / 4	2-7 / 8
* DLGP512218	30	.1285	1-5 / 8	2-3 / 4
* DLGP512217	31	.1200	1-5 / 8	2-3 / 4
* DLGP512216	32	.1160	1-5 / 8	2-3 / 4
* DLGP512215	33	.1130	1-1 / 2	2-5 / 8
* DLGP512214	34	.1110	1-1 / 2	2-5 / 8
* DLGP512213	35	.1100	1-1 / 2	2-5 / 8
* DLGP512212	36	.1065	1-7 / 16	2-1 / 2
* DLGP512211	37	.1040	1-7 / 16	2-1 / 2
* DLGP512210	38	.1015	1-7 / 16	2-1 / 2
* DLGP512209	39	.0995	1-3 / 8	2-3 / 8
* DLGP512208	40	.0980	1-3 / 8	2-3 / 8
* DLGP512207	41	.0960	1-3 / 8	2-3 / 8
* DLGP512206	42	.0935	1-1 / 4	2-1 / 4
* DLGP512205	43	.0890	1-1 / 4	2-1 / 4
* DLGP512204	44	.0860	1-1 / 8	2-1 / 8
* DLGP512203	45	.0820	1-1 / 8	2-1 / 8
* DLGP512202	46	.0810	1-1 / 8	2-1 / 8
* DLGP512201	47	.0785	1	2

▶**Tolerance** : See page 124

* 10per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

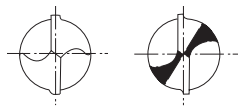
GOLD-P DRILLS

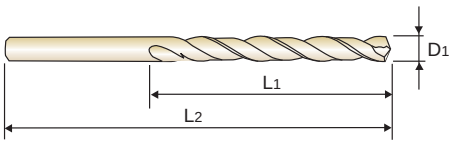
DLGP195 SERIES

HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 135°
under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface treatment** : Bright body, TiN coating on working area
▶**Application** : Drilling to steels, cast steels alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





DIN 338 | HSS Co5 | N ≈33° | h8 | 135° P.138

Unit : mm

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP195010	1.0	.0394	12	34
* DLGP195011	1.1	.0433	14	36
* DLGP195012	1.2	.0472	16	38
* DLGP195013	1.3	.0512	16	38
* DLGP195014	1.4	.0551	18	40
* DLGP195015	1.5	.0591	18	40
* DLGP195016	1.6	.0630	20	43
* DLGP195017	1.7	.0669	20	43
* DLGP195018	1.8	.0709	22	46
* DLGP195019	1.9	.0748	22	46
* DLGP195020	2.0	.0787	24	49
* DLGP195021	2.1	.0827	24	49
* DLGP195022	2.2	.0866	27	53
* DLGP195023	2.3	.0906	27	53
* DLGP195024	2.4	.0945	30	57
* DLGP195025	2.5	.0984	30	57
* DLGP195026	2.6	.1024	30	57
* DLGP195027	2.7	.1063	33	61
* DLGP195028	2.8	.1102	33	61
* DLGP195029	2.9	.1142	33	61
* DLGP195030	3.0	.1181	33	61
* DLGP195031	3.1	.1220	36	65
* DLGP195032	3.2	.1260	36	65
* DLGP195033	3.3	.1299	36	65
* DLGP195034	3.4	.1339	39	70
* DLGP195035	3.5	.1378	39	70
* DLGP195036	3.6	.1417	39	70
* DLGP195037	3.7	.1457	39	70
* DLGP195038	3.8	.1496	43	75
* DLGP195039	3.9	.1535	43	75
* DLGP195040	4.0	.1575	43	75

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP195041	4.1	.1614	43	75
* DLGP195042	4.2	.1654	43	75
* DLGP195043	4.3	.1693	47	80
* DLGP195044	4.4	.1732	47	80
* DLGP195045	4.5	.1772	47	80
* DLGP195046	4.6	.1811	47	80
* DLGP195047	4.7	.1850	47	80
* DLGP195048	4.8	.1890	52	86
* DLGP195049	4.9	.1929	52	86
* DLGP195050	5.0	.1969	52	86
* DLGP195051	5.1	.2008	52	86
* DLGP195052	5.2	.2047	52	86
* DLGP195053	5.3	.2087	52	86
* DLGP195054	5.4	.2126	57	93
* DLGP195055	5.5	.2165	57	93
* DLGP195056	5.6	.2205	57	93
* DLGP195057	5.7	.2244	57	93
* DLGP195058	5.8	.2283	57	93
* DLGP195059	5.9	.2323	57	93
* DLGP195060	6.0	.2362	57	93
* DLGP195061	6.1	.2402	63	101
* DLGP195062	6.2	.2441	63	101
* DLGP195063	6.3	.2480	63	101
* DLGP195064	6.4	.2520	63	101
* DLGP195065	6.5	.2559	63	101
* DLGP195066	6.6	.2598	63	101
* DLGP195067	6.7	.2638	63	101
* DLGP195068	6.8	.2677	69	109
* DLGP195069	6.9	.2717	69	109
* DLGP195070	7.0	.2756	69	109
* DLGP195071	7.1	.2795	69	109

* 10per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

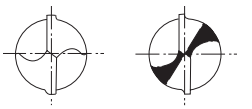
GOLD-P DRILLS

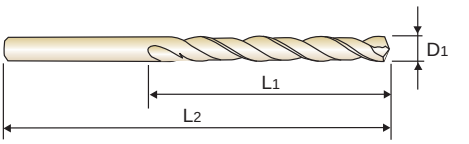
DLGP195 SERIES

HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 135°
under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface treatment** : Bright body, TiN coating on working area
▶**Application** : Drilling to steels, cast steels alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





DIN 338 | HSS Co5 | N ≈ 33° | h8 | 135° P.138

Unit : mm

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP195072	7.2	.2835	69	109
* DLGP195073	7.3	.2874	69	109
* DLGP195074	7.4	.2913	69	109
* DLGP195075	7.5	.2953	69	109
* DLGP195076	7.6	.2992	75	117
* DLGP195077	7.7	.3031	75	117
* DLGP195078	7.8	.3071	75	117
* DLGP195079	7.9	.3110	75	117
* DLGP195080	8.0	.3150	75	117
* DLGP195081	8.1	.3189	75	117
* DLGP195082	8.2	.3228	75	117
* DLGP195083	8.3	.3268	75	117
** DLGP195084	8.4	.3307	75	117
** DLGP195085	8.5	.3346	75	117
** DLGP195086	8.6	.3386	81	125
** DLGP195087	8.7	.3425	81	125
** DLGP195088	8.8	.3465	81	125
** DLGP195089	8.9	.3504	81	125
** DLGP195090	9.0	.3543	81	125
** DLGP195091	9.1	.3583	81	125
** DLGP195092	9.2	.3622	81	125
** DLGP195093	9.3	.3661	81	125
** DLGP195094	9.4	.3701	81	125
** DLGP195095	9.5	.3740	81	125
** DLGP195096	9.6	.3780	87	133
** DLGP195097	9.7	.3819	87	133
** DLGP195098	9.8	.3858	87	133
** DLGP195099	9.9	.3898	87	133
** DLGP195100	10.0	.3937	87	133
** DLGP195101	10.1	.3976	87	133

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
** DLGP195102	10.2	.4016	87	133
** DLGP195103	10.3	.4055	87	133
** DLGP195104	10.4	.4094	87	133
** DLGP195105	10.5	.4134	87	133
** DLGP195106	10.6	.4173	87	133
** DLGP195107	10.7	.4212	94	142
** DLGP195108	10.8	.4252	94	142
** DLGP195109	10.9	.4291	94	142
** DLGP195110	11.0	.4330	94	142
** DLGP195111	11.1	.4370	94	142
** DLGP195112	11.2	.4409	94	142
** DLGP195113	11.3	.4448	94	142
** DLGP195114	11.4	.4488	94	142
** DLGP195115	11.5	.4527	94	142
** DLGP195116	11.6	.4566	94	142
** DLGP195117	11.7	.4606	94	142
** DLGP195118	11.8	.4645	94	142
** DLGP195119	11.9	.4685	101	151
** DLGP195120	12.0	.4724	101	151
** DLGP195121	12.1	.4764	101	151
** DLGP195122	12.2	.4803	101	151
** DLGP195123	12.3	.4843	101	151
** DLGP195124	12.4	.4882	101	151
** DLGP195125	12.5	.4921	101	151
** DLGP195126	12.6	.4921	101	151
** DLGP195127	12.7	.5000	101	151
** DLGP195128	12.8	.5039	101	151
** DLGP195129	12.9	.5079	101	151
** DLGP195130	13.0	.5118	101	151

* 10per package
** 5per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

GOLD-P DRILLS

DLGP506 SERIES

HSSCo5, DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED

JOBBER

▶**Flute Geometry** : Right hand, 38° helix, Parabolic flutes
▶**Point Angle** : 130°, Split point giving higher chip removal.
▶**Surface treatment** : Bright body, TiN coating on working area.
▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, Special aluminum or magnesium alloys.

DIN 338 | HSS Co5 | N ≈ 38° | h8 | 130° P.139

Unit : mm

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP506020	2.0	.0787	24	49
* DLGP506021	2.1	.0827	24	49
* DLGP506022	2.2	.0866	27	53
* DLGP506023	2.3	.0906	27	53
* DLGP506024	2.4	.0945	30	57
* DLGP506025	2.5	.0984	30	57
* DLGP506026	2.6	.1024	30	57
* DLGP506027	2.7	.1063	33	61
* DLGP506028	2.8	.1102	33	61
* DLGP506029	2.9	.1142	33	61
* DLGP506030	3.0	.1181	33	61
* DLGP506031	3.1	.1220	36	65
* DLGP506032	3.2	.1260	36	65
* DLGP506033	3.3	.1299	36	65
* DLGP506034	3.4	.1339	39	70
* DLGP506035	3.5	.1378	39	70
* DLGP506036	3.6	.1417	39	70
* DLGP506037	3.7	.1457	39	70
* DLGP506038	3.8	.1496	43	75
* DLGP506039	3.9	.1535	43	75
* DLGP506040	4.0	.1575	43	75
* DLGP506041	4.1	.1614	43	75
* DLGP506042	4.2	.1654	43	75
* DLGP506043	4.3	.1693	47	80
* DLGP506044	4.4	.1732	47	80
* DLGP506045	4.5	.1772	47	80
* DLGP506046	4.6	.1811	47	80
* DLGP506047	4.7	.1850	47	80

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP506048	4.8	.1890	52	86
* DLGP506049	4.9	.1929	52	86
* DLGP506050	5.0	.1969	52	86
* DLGP506051	5.1	.2008	52	86
* DLGP506052	5.2	.2047	52	86
* DLGP506053	5.3	.2087	52	86
* DLGP506054	5.4	.2126	57	93
* DLGP506055	5.5	.2165	57	93
* DLGP506056	5.6	.2205	57	93
* DLGP506057	5.7	.2244	57	93
* DLGP506058	5.8	.2283	57	93
* DLGP506059	5.9	.2323	57	93
* DLGP506060	6.0	.2362	57	93
* DLGP506061	6.1	.2402	63	101
* DLGP506062	6.2	.2441	63	101
* DLGP506063	6.3	.2480	63	101
* DLGP506064	6.4	.2520	63	101
* DLGP506065	6.5	.2559	63	101
* DLGP506066	6.6	.2598	63	101
* DLGP506067	6.7	.2638	63	101
* DLGP506068	6.8	.2677	69	109
* DLGP506069	6.9	.2717	69	109
* DLGP506070	7.0	.2756	69	109
* DLGP506071	7.1	.2795	69	109
* DLGP506072	7.2	.2835	69	109
* DLGP506073	7.3	.2874	69	109
* DLGP506074	7.4	.2913	69	109
* DLGP506075	7.5	.2953	69	109

* 10per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

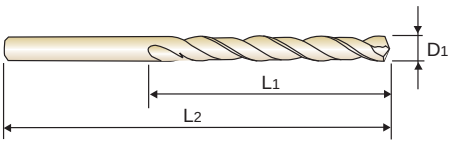
GOLD-P DRILLS

DLGP506 SERIES

HSSCo5, DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED

JOBBER

- ▶**Flute Geometry** : Right hand, 38° helix, Parabolic flutes
- ▶**Point Angle** : 130°, Split point giving higher chip removal.
- ▶**Surface treatment** : Bright body, TiN coating on working area.
- ▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, Special aluminum or magnesium alloys.



DIN 338 | HSS Co5 | N ≈ 38° | h8 | 130° P.139

Unit : mm

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
* DLGP506076	7.6	.2992	75	117
* DLGP506077	7.7	.3031	75	117
* DLGP506078	7.8	.3071	75	117
* DLGP506079	7.9	.3110	75	117
* DLGP506080	8.0	.3150	75	117
* DLGP506081	8.1	.3189	75	117
* DLGP506082	8.2	.3228	75	117
* DLGP506083	8.3	.3268	75	117
** DLGP506084	8.4	.3307	75	117
** DLGP506085	8.5	.3346	75	117
** DLGP506086	8.6	.3386	81	125
** DLGP506087	8.7	.3425	81	125
** DLGP506088	8.8	.3465	81	125
** DLGP506089	8.9	.3504	81	125
** DLGP506090	9.0	.3543	81	125
** DLGP506091	9.1	.3583	81	125
** DLGP506092	9.2	.3622	81	125
** DLGP506093	9.3	.3661	81	125
** DLGP506094	9.4	.3701	81	125
** DLGP506095	9.5	.3740	81	125
** DLGP506096	9.6	.3780	87	133
** DLGP506097	9.7	.3819	87	133
** DLGP506098	9.8	.3858	87	133
** DLGP506099	9.9	.3898	87	133
** DLGP506100	10.0	.3937	87	133
** DLGP506101	10.1	.3976	87	133
** DLGP506102	10.2	.4016	87	133
** DLGP506103	10.3	.4055	87	133

EDP No.	Diameter Metric D1	Diameter Inch D1	Flute Length L1	Overall Length L2
** DLGP506104	10.4	.4094	87	133
** DLGP506105	10.5	.4134	87	133
** DLGP506106	10.6	.4173	87	133
** DLGP506107	10.7	.4212	94	142
** DLGP506108	10.8	.4252	94	142
** DLGP506109	10.9	.4291	94	142
** DLGP506110	11.0	.4330	94	142
** DLGP506111	11.1	.4370	94	142
** DLGP506112	11.2	.4409	94	142
** DLGP506113	11.3	.4448	94	142
** DLGP506114	11.4	.4488	94	142
** DLGP506115	11.5	.4527	94	142
** DLGP506116	11.6	.4566	94	142
** DLGP506117	11.7	.4606	94	142
** DLGP506118	11.8	.4645	94	142
** DLGP506119	11.9	.4685	101	151
** DLGP506120	12.0	.4724	101	151
** DLGP506121	12.1	.4764	101	151
** DLGP506122	12.2	.4803	101	151
** DLGP506123	12.3	.4843	101	151
** DLGP506124	12.4	.4882	101	151
** DLGP506125	12.5	.4921	101	151
** DLGP506126	12.6	.4921	101	151
** DLGP506127	12.7	.5000	101	151
** DLGP506128	12.8	.5039	101	151
** DLGP506129	12.9	.5079	101	151
** DLGP506130	13.0	.5118	101	151

* 10per package
** 5per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

GOLD-P COATED DRILL SETS

EDP No.	Series No.	Description	SIZE	Q'TY
D1GP138 SET	D1GP SET924	HSS Straight Shank, Split Point (#53 ~ #56 : NORMAL point)	#1~ #56(Wire gauge)	56 pcs
D1GP139 SET	D1GP SET925	HSS Straight Shank, Split Point	A~Z(Letter)	26 pcs
D1GP182 SET	D1GP SET926	HSS Straight Shank, Split Point	Ø1/16~ Ø1/2(Fracitional)	29 pcs
D2GP185 SET	D2GP SET927	HSSCo8 Straight Shank, Split Point	Ø1/16~ Ø1/2(Fracitional)	29 pcs
D2GP186 SET	D2GP SET928	HSSCo8 Straight Shank, Split Point	A~Z(Letter)	26 pcs
D2GP187 SET	D2GP SET930	HSSCo8 Straight Shank, Split Point (#53 ~ #56 : NORMAL point)	#1~ #56(Wire gauge)	56 pcs
DLGP511 SET	DLGP SET931	HSSCo5 Straight Shank, Split Point	Ø5/64~ Ø1/2(Fracitional)	28 pcs
DLGP512 SET	DLGP SET932	HSSCo5 Straight Shank, Split Point	#1~ #47(Wire gauge)	47 pcs
DLGP513 SET	DLGP SET933	HSSCo5 Straight Shank, Split Point	A~Z(Letter)	26 pcs

HSS & HSSCo5, STRAIGHT SHANK, GOLD-P COATED

D1GP182, D1GP139, D1GP138, D2GP185, D2GP186, D2GP187, DLGP195, SERIES

WORK MATERIAL			CARBON STEELS		CARBON STEELS		ALLOY STEELS		STAINLESS STEELS	
HARDNESS					~ HRc23		HRc23 ~ 34		~ HRc23	
STRENGTH			~ 570N/mm²		~ 830N/mm²		830~1110N/mm²		~ 830N/mm²	
DIAMETER			N	S	N	S	N	S	N	S
Fractional	Decimal	Metric								
3/64	.0469	1.0	14000	0.0008	12500	0.0008	7700	0.0008	7000	0.0008
#47	.0785	2.0	7000	0.0023	6100	0.0024	3850	0.0024	3500	0.0024
#32	.1160	3.0	4650	0.0038	4100	0.0031	2550	0.0031	2350	0.0031
#22	.1570	4.0	3500	0.0044	3050	0.0043	1950	0.0039	1750	0.0039
#9	.1960	5.0	2800	0.0049	2450	0.0043	1550	0.0039	1400	0.0039
B	.2380	6.0	2350	0.0056	2050	0.0051	1300	0.0047	1150	0.0047
J	.2770	7.0	2000	0.0064	1750	0.0059	1100	0.0055	1000	0.0055
O	.3160	8.0	1750	0.0072	1550	0.0071	960	0.0059	875	0.0059
T	.3580	9.0	1550	0.0077	1350	0.0087	855	0.0071	780	0.0071
X	.3970	10.0	1400	0.0084	1250	0.0087	770	0.0071	700	0.0071
7/16	.4375	11.0	1250	0.0087	1100	0.0087	700	0.0071	650	0.0071
15/32	.4688	12.0	1150	0.0090	1000	0.0087	650	0.0079	585	0.0079
1/2	.5000	13.0	1050	0.0090	950	0.0087	595	0.0079	540	0.0079

WORK MATERIAL			TITANIUM ALLOYS		ALUMINUM ALLOYS, ZINC ALLOYS		MAGNESIUM ALLOYS	
HARDNESS								
STRENGTH			~410N/mm²					
DIAMETER			N	S	N	S	N	S
Fractional	Decimal	Metric						
3/64	.0469	1.0	8050	0.0008	30000	0.0008	11500	0.0012
#47	.0785	2.0	4050	0.0024	15000	0.0023	5800	0.0035
#32	.1160	3.0	2700	0.0031	9900	0.0038	3850	0.0051
#22	.1570	4.0	2000	0.0035	7450	0.0044	2900	0.0059
#9	.1960	5.0	1600	0.0039	5950	0.0049	2300	0.0067
B	.2380	6.0	1350	0.0047	4950	0.0056	1950	0.0075
J	.2770	7.0	1150	0.0055	4250	0.0064	1650	0.0087
O	.3160	8.0	1000	0.0059	3700	0.0072	1450	0.0094
T	.3580	9.0	895	0.0067	3300	0.0079	1280	0.0106
X	.3970	10.0	805	0.0071	3000	0.0090	1150	0.0114
7/16	.4375	11.0	730	0.0071	2700	0.0090	1050	0.0118
15/32	.4688	12.0	670	0.0079	2480	0.0090	960	0.0122
1/2	.5000	13.0	620	0.0079	2300	0.0090	890	0.0122

N = R.P.M
S = Inch per Revolution(inch/rev.)

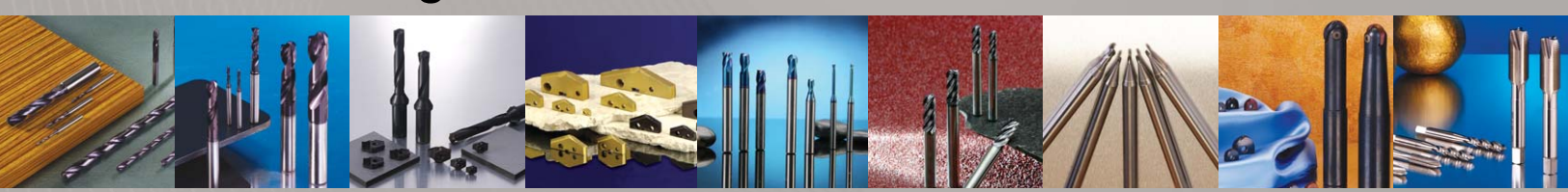
HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

DLGP511, DLGP513, DLGP512, DLGP506 SERIES

WORK MATERIAL			CARBON STEELS ALLOY STEELS		TOOL STEELS HARDENED STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
HARDNESS			HRc15 ~ 30		HRc20 ~ 40					
STRENGTH			700 ~ 1000N/mm²		800~1200N/mm²					
DIAMETER			N	S	N	S	N	S	N	S
Fractional	Decimal	Metric								
3/64	.0469	1.0	8750	0.0008	6300	0.0008	16000	0.0008	9800	0.0008
#47	.0785	2.0	4400	0.0022	3150	0.0022	7900	0.0027	4900	0.0027
#32	.1160	3.0	2900	0.0032	2100	0.0032	5250	0.0043	3250	0.0043
#22	.1570	4.0	2200	0.0036	1600	0.0036	3950	0.0054	2450	0.0054
#9	.1960	5.0	1750	0.0041	1250	0.0041	3150	0.0054	1950	0.0054
B	.2380	6.0	1450	0.0047	1050	0.0047	2650	0.0069	1650	0.0069
J	.2770	7.0	1250	0.0054	900	0.0054	2250	0.0078	1400	0.0078
O	.3160	8.0	1100	0.0060	790	0.0060	1950	0.0087	1250	0.0087
T	.3580	9.0	975	0.0066	700	0.0066	1750	0.0095	1100	0.0095
X	.3970	10.0	875	0.0071	630	0.0071	1600	0.0108	980	0.0108
7/16	.4375	11.0	800	0.0077	575	0.0077	1450	0.0108	890	0.0108
15/32	.4688	12.0	730	0.0077	525	0.0077	1300	0.0108	815	0.0108
1/2	.5000	13.0	675	0.0077	485	0.0077	1200	0.0108	755	0.0108

N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation

STRAIGHT SHANK DRILLS

- **General Purpose**

STRAIGHT SHANK TWIST DRILLS

HSS Drills for soft materials & HSS cobalt Drills for tough materials

◎ : Excellent
○ : Good

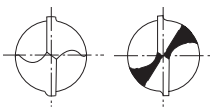
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		
◎	◎				○	○	○	○	○		
◎	◎				○	○	○	○	○		
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
◎	◎					○	○	○	○		
◎	◎				○	○			○		
◎	◎				○	○			○		
◎	◎				○	○			○		
◎	◎				○	○			○		
◎	◎				○	○	○	○	○		

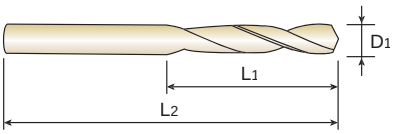
STRAIGHT SHANK DRILLS

D1118 SERIES

HSS, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°
under 1/16 : Normal point
1/16 & over : Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI HSS N 20~30° ANSI 135° P.158

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional D1	Diameter Decimal D1	Flute Length L1	Overall Length L2
* D1118003	3/64	.0469	1/2	1-3/8
* D1118004	1/16	.0625	5/8	1-5/8
* D1118005	5/64	.0781	11/16	1-11/16
* D1118006	3/32	.0938	3/4	1-3/4
* D1118007	7/64	.1094	13/16	1-13/16
* D1118008	1/8	.1250	7/8	1-7/8
* D1118009	9/64	.1406	15/16	1-15/16
* D1118010	5/32	.1563	1	2-1/16
* D1118011	11/64	.1719	1-1/16	2-1/8
* D1118012	3/16	.1875	1-1/8	2-3/16
* D1118013	13/64	.2031	1-3/16	2-1/4
* D1118014	7/32	.2188	1-1/4	2-3/8
* D1118015	15/64	.2344	1-5/16	2-7/16
* D1118016	1/4	.2500	1-3/8	2-1/2
* D1118017	17/64	.2656	1-7/16	2-5/8

EDP No.	Diameter Fractional D1	Diameter Decimal D1	Flute Length L1	Overall Length L2
* D1118018	9/32	.2813	1-1/2	2-11/16
* D1118019	19/64	.2969	1-9/16	2-3/4
* D1118020	5/16	.3125	1-5/8	2-13/16
* D1118021	21/64	.3281	1-11/16	2-15/16
** D1118022	11/32	.3438	1-11/16	3
** D1118023	23/64	.3594	1-3/4	3-1/16
** D1118024	3/8	.3750	1-13/16	3-1/8
** D1118025	25/64	.3906	1-7/8	3-1/4
** D1118026	13/32	.4063	1-15/16	3-5/16
** D1118027	27/64	.4219	2	3-3/8
** D1118028	7/16	.4375	2-1/16	3-7/16
** D1118029	29/64	.4531	2-1/8	3-9/16
** D1118030	15/32	.4688	2-1/8	3-5/8
** D1118031	31/64	.4844	2-3/16	3-11/16
** D1118032	1/2	.5000	2-1/4	3-3/4

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ -.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ -.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ -.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

STRAIGHT SHANK DRILLS

D1115 SERIES

HSS, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°:Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron

ANSI HSS N 20~30° ANSI 135° P.158

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1115201	A	.2340	1-5 / 16	2-7 / 16
* D1115202	B	.2380	1-3 / 8	2-1 / 2
* D1115203	C	.2420	1-3 / 8	2-1 / 2
* D1115204	D	.2460	1-3 / 8	2-1 / 2
* D1115205	E	.2500	1-3 / 8	2-1 / 2
* D1115206	F	.2570	1-7 / 16	2-5 / 8
* D1115207	G	.2610	1-7 / 16	2-5 / 8
* D1115208	H	.2660	1-1 / 2	2-11 / 16
* D1115209	I	.2720	1-1 / 2	2-11 / 16
* D1115210	J	.2770	1-1 / 2	2-11 / 16
* D1115211	K	.2810	1-1 / 2	2-11 / 16
* D1115212	L	.2900	1-9 / 16	2-3 / 4
* D1115213	M	.2950	1-9 / 16	2-3 / 4

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1115214	N	.3020	1-5 / 8	2-13 / 16
* D1115215	O	.3160	1-11 / 16	2-15 / 16
* D1115216	P	.3230	1-11 / 16	2-15 / 16
** D1115217	Q	.3320	1-11 / 16	3
** D1115218	R	.3390	1-11 / 16	3
** D1115219	S	.3480	1-3 / 4	3-1 / 16
** D1115220	T	.3580	1-3 / 4	3-1 / 16
** D1115221	U	.3680	1-13 / 16	3-1 / 8
** D1115222	V	.3770	1-7 / 8	3-1 / 4
** D1115223	W	.3860	1-7 / 8	3-1 / 4
** D1115224	X	.3970	1-15 / 16	3-5 / 16
** D1115225	Y	.4040	1-15 / 16	3-5 / 16
** D1115226	Z	.4130	2	3-3 / 8

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

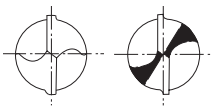
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

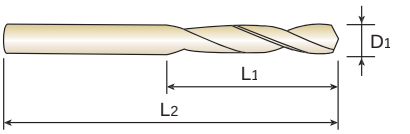
STRAIGHT SHANK DRILLS

D1119 SERIES

HSS, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°:Split point
Wire gauge size #53~#60:Normal point
Wire gauge size #1~#52:Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI HSS N 20~30° ANSI 135° P.158

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	L1	L2
* D1119201	1	.2280	1-5 / 16	2-7 / 16
* D1119202	2	.2210	1-5 / 16	2-7 / 16
* D1119203	3	.2130	1-1 / 4	2-3 / 8
* D1119204	4	.2090	1-1 / 4	2-3 / 8
* D1119205	5	.2055	1-1 / 4	2-3 / 8
* D1119206	6	.2040	1-1 / 4	2-3 / 8
* D1119207	7	.2010	1-3 / 16	2-1 / 4
* D1119208	8	.1990	1-3 / 16	2-1 / 4
* D1119209	9	.1960	1-3 / 16	2-1 / 4
* D1119210	10	.1935	1-3 / 16	2-1 / 4
* D1119211	11	.1910	1-3 / 16	2-1 / 4
* D1119212	12	.1890	1-3 / 16	2-1 / 4
* D1119213	13	.1850	1-1 / 8	2-3 / 16
* D1119214	14	.1820	1-1 / 8	2-3 / 16
* D1119215	15	.1800	1-1 / 8	2-3 / 16
* D1119216	16	.1770	1-1 / 8	2-3 / 16
* D1119217	17	.1730	1-1 / 8	2-3 / 16
* D1119218	18	.1695	1-1 / 16	2-1 / 8
* D1119219	19	.1660	1-1 / 16	2-1 / 8
* D1119220	20	.1610	1-1 / 16	2-1 / 8
* D1119221	21	.1590	1-1 / 16	2-1 / 8
* D1119222	22	.1570	1-1 / 16	2-1 / 8
* D1119223	23	.1540	1	2-1 / 16
* D1119224	24	.1520	1	2-1 / 16
* D1119225	25	.1495	1	2-1 / 16
* D1119226	26	.1470	1	2-1 / 16
* D1119227	27	.1440	1	2-1 / 16
* D1119228	28	.1405	15 / 16	1-15 / 16
* D1119229	29	.1360	15 / 16	1-15 / 16
* D1119230	30	.1285	15 / 16	1-15 / 16

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	L1	L2
* D1119231	31	.1200	7 / 8	1-7 / 8
* D1119232	32	.1160	7 / 8	1-7 / 8
* D1119233	33	.1130	7 / 8	1-7 / 8
* D1119234	34	.1110	7 / 8	1-7 / 8
* D1119235	35	.1100	7 / 8	1-7 / 8
* D1119236	36	.1065	13 / 16	1-13 / 16
* D1119237	37	.1040	13 / 16	1-13 / 16
* D1119238	38	.1015	13 / 16	1-13 / 16
* D1119239	39	.0995	13 / 16	1-13 / 16
* D1119240	40	.0980	13 / 16	1-13 / 16
* D1119241	41	.0960	13 / 16	1-13 / 16
* D1119242	42	.0935	3 / 4	1-3 / 4
* D1119243	43	.0890	3 / 4	1-3 / 4
* D1119244	44	.0860	3 / 4	1-3 / 4
* D1119245	45	.0820	3 / 4	1-3 / 4
* D1119246	46	.0810	3 / 4	1-3 / 4
* D1119247	47	.0785	11 / 16	1-11 / 16
* D1119248	48	.0760	11 / 16	1-11 / 16
* D1119249	49	.0730	11 / 16	1-11 / 16
* D1119250	50	.0700	11 / 16	1-11 / 16
* D1119251	51	.0670	11 / 16	1-11 / 16
* D1119252	52	.0635	11 / 16	1-11 / 16
* D1119253	53	.0595	5 / 8	1-5 / 8
* D1119254	54	.0550	5 / 8	1-5 / 8
* D1119255	55	.0520	5 / 8	1-5 / 8
* D1119256	56	.0465	1 / 2	1-3 / 8
* D1119257	57	.0430	1 / 2	1-3 / 8
* D1119258	58	.0420	1 / 2	1-3 / 8
* D1119259	59	.0410	1 / 2	1-3 / 8
* D1119260	60	.0400	1 / 2	1-3 / 8

▶**Tolerance** : See page 144 / *10per package

◎ : Excellent ○ : Good

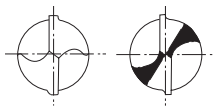
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

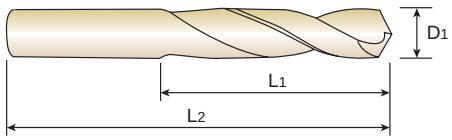
STRAIGHT SHANK DRILLS

D2146 SERIES UN-COATED
D4146 SERIES TiN-COATED

HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°
under 1/16 : Normal point
1/16 & over : Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI | HSS Co8 | N 20~30° | ANSI | 135° | P.158

▶ Fractional sizes

Unit : Inch

EDP No.		Diameter		Flute Length	Overall Length
		Fractional	Decimal		
UN-COATED	TiN-COATED	D1		L1	L2
* D2146003	D4146003	3/64	.0469	1/2	1-3/8
* D2146004	D4146004	1/16	.0625	5/8	1-5/8
* D2146005	D4146005	5/64	.0781	11/16	1-11/16
* D2146006	D4146006	3/32	.0938	3/4	1-3/4
** D2146007	D4146007	7/64	.1094	13/16	1-13/16
** D2146008	D4146008	1/8	.1250	7/8	1-7/8
** D2146009	D4146009	9/64	.1406	15/16	1-15/16
** D2146010	D4146010	5/32	.1563	1	2-1/16
** D2146011	D4146011	11/64	.1719	1-1/16	2-1/8
** D2146012	D4146012	3/16	.1875	1-1/8	2-3/16
** D2146013	D4146013	13/64	.2031	1-3/16	2-1/4
** D2146014	D4146014	7/32	.2188	1-1/4	2-3/8
** D2146015	D4146015	15/64	.2344	1-5/16	2-7/16
** D2146016	D4146016	1/4	.2500	1-3/8	2-1/2
** D2146017	D4146017	17/64	.2656	1-7/16	2-5/8
** D2146018	D4146018	9/32	.2813	1-1/2	2-11/16
** D2146019	D4146019	19/64	.2969	1-9/16	2-3/4
** D2146020	D4146020	5/16	.3125	1-5/8	2-13/16
** D2146021	D4146021	21/64	.3281	1-11/16	2-15/16
** D2146022	D4146022	11/32	.3438	1-11/16	3
** D2146023	D4146023	23/64	.3594	1-3/4	3-1/16
** D2146024	D4146024	3/8	.3750	1-13/16	3-1/8
** D2146025	D4146025	25/64	.3906	1-7/8	3-1/4
** D2146026	D4146026	13/32	.4063	1-15/16	3-5/16
** D2146027	D4146027	27/64	.4219	2	3-3/8
** D2146028	D4146028	7/16	.4375	2-1/16	3-7/16
** D2146029	D4146029	29/64	.4531	2-1/8	3-9/16
** D2146030	D4146030	15/32	.4688	2-1/8	3-5/8
** D2146031	D4146031	31/64	.4844	2-3/16	3-11/16
** D2146032	D4146032	1/2	.5000	2-1/4	3-3/4

▶**Tolerance** : See page 144 / * 10per package, ** 5per package

◎ : Excellent ○ : Good

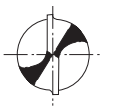
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

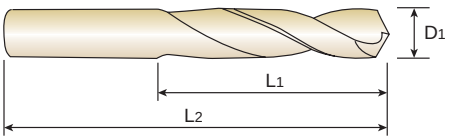
STRAIGHT SHANK DRILLS

D2147 SERIES UN-COATED
D4147 SERIES TiN-COATED

HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°:Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI HSS Co8 N 20~30° ANSI 135° P.158

▶ Letter sizes

Unit : Inch

EDP No.		Diameter		Flute Length	Overall Length
		Letter	Decimal		
UN-COATED	TiN-COATED	D1		L1	L2
** D2147201	D4147201	A	.2340	1-5 / 16	2-7 / 16
** D2147202	D4147202	B	.2380	1-3 / 8	2-1 / 2
** D2147203	D4147203	C	.2420	1-3 / 8	2-1 / 2
** D2147204	D4147204	D	.2460	1-3 / 8	2-1 / 2
** D2147205	D4147205	E	.2500	1-3 / 8	2-1 / 2
** D2147206	D4147206	F	.2570	1-7 / 16	2-5 / 8
** D2147207	D4147207	G	.2610	1-7 / 16	2-5 / 8
** D2147208	D4147208	H	.2660	1-1 / 2	2-11 / 16
** D2147209	D4147209	I	.2720	1-1 / 2	2-11 / 16
** D2147210	D4147210	J	.2770	1-1 / 2	2-11 / 16
** D2147211	D4147211	K	.2810	1-1 / 2	2-11 / 16
** D2147212	D4147212	L	.2900	1-9 / 16	2-3 / 4
** D2147213	D4147213	M	.2950	1-9 / 16	2-3 / 4
** D2147214	D4147214	N	.3020	1-5 / 8	2-13 / 16
** D2147215	D4147215	O	.3160	1-11 / 16	2-15 / 16
** D2147216	D4147216	P	.3230	1-11 / 16	2-15 / 16
** D2147217	D4147217	Q	.3320	1-11 / 16	3
** D2147218	D4147218	R	.3390	1-11 / 16	3
** D2147219	D4147219	S	.3480	1-3 / 4	3-1 / 16
** D2147220	D4147220	T	.3580	1-3 / 4	3-1 / 16
** D2147221	D4147221	U	.3680	1-13 / 16	3-1 / 8
** D2147222	D4147222	V	.3770	1-7 / 8	3-1 / 4
** D2147223	D4147223	W	.3860	1-7 / 8	3-1 / 4
** D2147224	D4147224	X	.3970	1-15 / 16	3-5 / 16
** D2147225	D4147225	Y	.4040	1-15 / 16	3-5 / 16
** D2147226	D4147226	Z	.4130	2	3-3 / 8

▶**Tolerance** : See page 144

** 5per package

◎ : Excellent ○ : Good

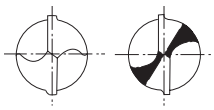
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

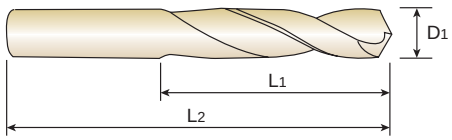
STRAIGHT SHANK DRILLS

D2148 SERIES UN-COATED
D4148 SERIES TiN-COATED

HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°:Split point
Wire gauge size #53~#60:Normal point
Wire gauge size #1~#52:Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI | HSS Co8 | N 20~30° | ANSI | 135° | P.158

▶ Wire gauge sizes

Unit : Inch

EDP No.		Diameter		Flute Length	Overall Length
		Wire gauge	Decimal		
UN-COATED	TiN-COATED	D1		L1	L2
** D2148101	D4148101	1	.2280	1-5 / 16	2-7 / 16
** D2148102	D4148102	2	.2210	1-5 / 16	2-7 / 16
** D2148103	D4148103	3	.2130	1-1 / 4	2-3 / 8
** D2148104	D4148104	4	.2090	1-1 / 4	2-3 / 8
** D2148105	D4148105	5	.2055	1-1 / 4	2-3 / 8
** D2148106	D4148106	6	.2040	1-1 / 4	2-3 / 8
** D2148107	D4148107	7	.2010	1-3 / 16	2-1 / 4
** D2148108	D4148108	8	.1990	1-3 / 16	2-1 / 4
** D2148109	D4148109	9	.1960	1-3 / 16	2-1 / 4
** D2148110	D4148110	10	.1935	1-3 / 16	2-1 / 4
** D2148111	D4148111	11	.1910	1-3 / 16	2-1 / 4
** D2148112	D4148112	12	.1890	1-3 / 16	2-1 / 4
** D2148113	D4148113	13	.1850	1-1 / 8	2-3 / 16
** D2148114	D4148114	14	.1820	1-1 / 8	2-3 / 16
** D2148115	D4148115	15	.1800	1-1 / 8	2-3 / 16
** D2148116	D4148116	16	.1770	1-1 / 8	2-3 / 16
** D2148117	D4148117	17	.1730	1-1 / 8	2-3 / 16
** D2148118	D4148118	18	.1695	1-1 / 16	2-1 / 8
** D2148119	D4148119	19	.1660	1-1 / 16	2-1 / 8
** D2148120	D4148120	20	.1610	1-1 / 16	2-1 / 8
** D2148121	D4148121	21	.1590	1-1 / 16	2-1 / 8
** D2148122	D4148122	22	.1570	1-1 / 16	2-1 / 8
** D2148123	D4148123	23	.1540	1	2-1 / 16
** D2148124	D4148124	24	.1520	1	2-1 / 16
** D2148125	D4148125	25	.1495	1	2-1 / 16
** D2148126	D4148126	26	.1470	1	2-1 / 16
** D2148127	D4148127	27	.1440	1	2-1 / 16
** D2148128	D4148128	28	.1405	15 / 16	1-15 / 16
** D2148129	D4148129	29	.1360	15 / 16	1-15 / 16
** D2148130	D4148130	30	.1285	15 / 16	1-15 / 16

▶**Tolerance** : See page 144 / ** 5per package

◎ : Excellent ○ : Good

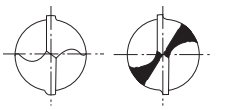
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

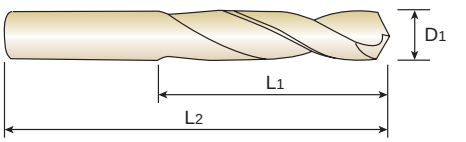
STRAIGHT SHANK DRILLS

D2148 SERIES UN-COATED
D4148 SERIES TiN-COATED

HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶**Flute Geometry** : Right hand spiral, wider flutes
▶**Point Angle** : 135°:Split point
Wire gauge size #53~#60:Normal point
Wire gauge size #1~#52:Split point
▶**Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron





ANSI HSS Co8 N 20~30° ANSI 135° P.158

▶ Wire gauge sizes

Unit : Inch

EDP No.		Diameter		Flute Length	Overall Length
		Wire gauge	Decimal		
UN-COATED	TiN-COATED	D1		L1	L2
** D2148131	D4148131	31	.1200	7 / 8	1-7 / 8
** D2148132	D4148132	32	.1160	7 / 8	1-7 / 8
** D2148133	D4148133	33	.1130	7 / 8	1-7 / 8
** D2148134	D4148134	34	.1110	7 / 8	1-7 / 8
** D2148135	D4148135	35	.1100	7 / 8	1-7 / 8
** D2148136	D4148136	36	.1065	13 / 16	1-13 / 16
* D2148137	D4148137	37	.1040	13 / 16	1-13 / 16
* D2148138	D4148138	38	.1015	13 / 16	1-13 / 16
* D2148139	D4148139	39	.0995	13 / 16	1-13 / 16
* D2148140	D4148140	40	.0980	13 / 16	1-13 / 16
* D2148141	D4148141	41	.0960	13 / 16	1-13 / 16
* D2148142	D4148142	42	.0935	3 / 4	1-3 / 4
* D2148143	D4148143	43	.0890	3 / 4	1-3 / 4
* D2148144	D4148144	44	.0860	3 / 4	1-3 / 4
* D2148145	D4148145	45	.0820	3 / 4	1-3 / 4
* D2148146	D4148146	46	.0810	3 / 4	1-3 / 4
* D2148147	D4148147	47	.0785	11 / 16	1-11 / 16
* D2148148	D4148148	48	.0760	11 / 16	1-11 / 16
* D2148149	D4148149	49	.0730	11 / 16	1-11 / 16
* D2148150	D4148150	50	.0700	11 / 16	1-11 / 16
* D2148151	D4148151	51	.0670	11 / 16	1-11 / 16
* D2148152	D4148152	52	.0635	11 / 16	1-11 / 16
* D2148153	D4148153	53	.0595	5 / 8	1-5 / 8
* D2148154	D4148154	54	.0550	5 / 8	1-5 / 8
* D2148155	D4148155	55	.0520	5 / 8	1-5 / 8
* D2148156	D4148156	56	.0465	1 / 2	1-3 / 8
* D2148157	D4148157	57	.0430	1 / 2	1-3 / 8
* D2148158	D4148158	58	.0420	1 / 2	1-3 / 8
* D2148159	D4148159	59	.0410	1 / 2	1-3 / 8
* D2148160	D4148160	60	.0400	1 / 2	1-3 / 8

▶**Tolerance** : See page 144 / *10per package, **5per package

◎ : Excellent ○ : Good

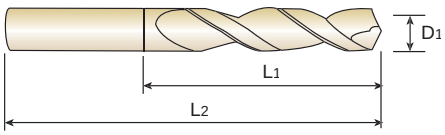
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○	○	○		

STRAIGHT SHANK DRILLS

DN514 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

▶**Flute Geometry** : Right hand spiral, Parabolic flute
38° helix
▶**Point Angle** : 130°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI HSS-E 38° ANSI 130°

P.159

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
TiN	D1		L1	L2
* DN514006	3/32	.0938	3/4	1-3/4
** DN514007	7/64	.1094	13/16	1-13/16
** DN514008	1/8	.1250	7/8	1-7/8
** DN514009	9/64	.1406	15/16	1-15/16
** DN514010	5/32	.1563	1	2-1/16
** DN514011	11/64	.1719	1-1/16	2-1/8
** DN514012	3/16	.1875	1-1/8	2-3/16
** DN514013	13/64	.2031	1-3/16	2-1/4
** DN514014	7/32	.2188	1-1/4	2-3/8
** DN514015	15/64	.2344	1-5/16	2-7/16
** DN514016	1/4	.2500	1-3/8	2-1/2
** DN514017	17/64	.2656	1-7/16	2-5/8
** DN514018	9/32	.2813	1-1/2	2-11/16
** DN514019	19/64	.2969	1-9/16	2-3/4

EDP No.	Diameter		Flute Length	Overall Length
	Fractional	Decimal		
TiN	D1		L1	L2
** DN514020	5/16	.3125	1-5/8	2-13/16
** DN514021	21/64	.3281	1-11/16	2-15/16
** DN514022	11/32	.3438	1-11/16	3
** DN514023	23/64	.3594	1-3/4	3-1/16
** DN514024	3/8	.3750	1-13/16	3-1/8
** DN514025	25/64	.3906	1-7/8	3-1/4
** DN514026	13/32	.4063	1-15/16	3-5/16
** DN514027	27/64	.4219	2	3-3/8
** DN514028	7/16	.4375	2-1/16	3-7/16
** DN514029	29/64	.4531	2-1/8	3-9/16
** DN514030	15/32	.4688	2-1/8	3-5/8
** DN514031	31/64	.4844	2-3/16	3-11/16
** DN514032	1/2	.5000	2-1/4	3-3/4

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ -.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ -.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ -.0010

◎ : Excellent ○ : Good

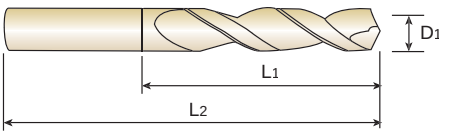
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

STRAIGHT SHANK DRILLS

DN516 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

▶**Flute Geometry** : Right hand spiral, Parabolic flute
38° helix
▶**Point Angle** : 130°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI HSS-E 38° ANSI 130° P.159

▶ Letter sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Letter	Decimal		
TiN	D1		L1	L2
** DN516101	A	.2340	1-5 / 16	2-7 / 16
** DN516102	B	.2380	1-3 / 8	2-1 / 2
** DN516103	C	.2420	1-3 / 8	2-1 / 2
** DN516104	D	.2460	1-3 / 8	2-1 / 2
** DN516105	E	.2500	1-3 / 8	2-1 / 2
** DN516106	F	.2570	1-7 / 16	2-5 / 8
** DN516107	G	.2610	1-7 / 16	2-5 / 8
** DN516108	H	.2660	1-1 / 2	2-11 / 16
** DN516109	I	.2720	1-1 / 2	2-11 / 16
** DN516110	J	.2770	1-1 / 2	2-11 / 16
** DN516111	K	.2810	1-1 / 2	2-11 / 16
** DN516112	L	.2900	1-9 / 16	2-3 / 4
** DN516113	M	.2950	1-9 / 16	2-3 / 4

EDP No.	Diameter		Flute Length	Overall Length
	Letter	Decimal		
TiN	D1		L1	L2
** DN516114	N	.3020	1-5 / 8	2-13 / 16
** DN516115	O	.3160	1-11 / 16	2-15 / 16
** DN516116	P	.3230	1-11 / 16	2-15 / 16
** DN516117	Q	.3320	1-11 / 16	3
** DN516118	R	.3390	1-11 / 16	3
** DN516119	S	.3480	1-3 / 4	3-1 / 16
** DN516120	T	.3580	1-3 / 4	3-1 / 16
** DN516121	U	.3680	1-13 / 16	3-1 / 8
** DN516122	V	.3770	1-7 / 8	3-1 / 4
** DN516123	W	.3860	1-7 / 8	3-1 / 4
** DN516124	X	.3970	1-15 / 16	3-5 / 16
** DN516125	Y	.4040	1-15 / 16	3-5 / 16
** DN516126	Z	.4130	2	3-3 / 8

** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ -.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ -.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ -.0010

◎ : Excellent ○ : Good

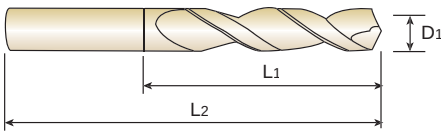
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

STRAIGHT SHANK DRILLS

DN515 SERIES

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

▶**Flute Geometry** : Right hand spiral, Parabolic flute
38° helix
▶**Point Angle** : 130°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



ANSI HSS-E 38° ANSI 130°

P.159

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal		
TiN	D1		L1	L2
** DN515201	1	.2280	1-5 / 16	2-7 / 16
** DN515202	2	.2210	1-5 / 16	2-7 / 16
** DN515203	3	.2130	1-1 / 4	2-3 / 8
** DN515204	4	.2090	1-1 / 4	2-3 / 8
** DN515205	5	.2055	1-1 / 4	2-3 / 8
** DN515206	6	.2040	1-1 / 4	2-3 / 8
** DN515207	7	.2010	1-3 / 16	2-1 / 4
** DN515208	8	.1990	1-3 / 16	2-1 / 4
** DN515209	9	.1960	1-3 / 16	2-1 / 4
** DN515210	10	.1935	1-3 / 16	2-1 / 4
** DN515211	11	.1910	1-3 / 16	2-1 / 4
** DN515212	12	.1890	1-3 / 16	2-1 / 4
** DN515213	13	.1850	1-1 / 8	2-3 / 16
** DN515214	14	.1820	1-1 / 8	2-3 / 16
** DN515215	15	.1800	1-1 / 8	2-3 / 16
** DN515216	16	.1770	1-1 / 8	2-3 / 16
** DN515217	17	.1730	1-1 / 8	2-3 / 16
** DN515218	18	.1695	1-1 / 16	2-1 / 8
** DN515219	19	.1660	1-1 / 16	2-1 / 8
** DN515220	20	.1610	1-1 / 16	2-1 / 8
** DN515221	21	.1590	1-1 / 16	2-1 / 8
** DN515222	22	.1570	1-1 / 16	2-1 / 8
** DN515223	23	.1540	1	2-1 / 16
** DN515224	24	.1520	1	2-1 / 16

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal		
TiN	D1		L1	L2
** DN515225	25	.1495	1	2-1 / 16
** DN515226	26	.1470	1	2-1 / 16
** DN515227	27	.1440	1	2-1 / 16
** DN515228	28	.1405	15 / 16	1-15 / 16
** DN515229	29	.1360	15 / 16	1-15 / 16
** DN515230	30	.1285	15 / 16	1-15 / 16
** DN515231	31	.1200	7 / 8	1-7 / 8
** DN515232	32	.1160	7 / 8	1-7 / 8
** DN515233	33	.1130	7 / 8	1-7 / 8
** DN515234	34	.1110	7 / 8	1-7 / 8
** DN515235	35	.1100	7 / 8	1-7 / 8
** DN515236	36	.1065	13 / 16	1-13 / 16
* DN515237	37	.1040	13 / 16	1-13 / 16
* DN515238	38	.1015	13 / 16	1-13 / 16
* DN515239	39	.0995	13 / 16	1-13 / 16
* DN515240	40	.0980	13 / 16	1-13 / 16
* DN515241	41	.0960	13 / 16	1-13 / 16
* DN515242	42	.0935	3 / 4	1-3 / 4
* DN515243	43	.0890	3 / 4	1-3 / 4
* DN515244	44	.0860	3 / 4	1-3 / 4
* DN515245	45	.0820	3 / 4	1-3 / 4
* DN515246	46	.0810	3 / 4	1-3 / 4
* DN515247	47	.0785	11 / 16	1-11 / 16

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

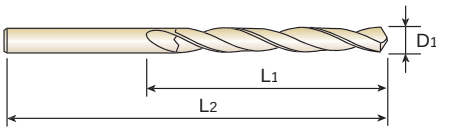
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

STRAIGHT SHANK DRILLS

DL517 SERIES UN-COATED
DX517 SERIES TiCN-COATED

HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL

▶Flute Geometry : Right hand spiral, Parabolic flute
38° helix
▶Point Angle : 130°:Split point
▶Application : Improved chip removal in most materials, especially in deep drilling applications.



ANSI HSS-E 38° ANSI 130°

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▶ Fractional sizes

Unit : Inch

EDP No.		Diameter		Flute Length	Overall Length
		Fractional	Decimal		
UN-COATED	TiCN-COATED	D1		L1	L2
* DL517005	DX517005	5/64	.0781	2	3-3/4
* DL517006	DX517006	3/32	.0938	2-1/4	4-1/4
* DL517007	DX517007	7/64	.1094	2-1/2	4-5/8
* DL517008	DX517008	1/8	.1250	2-3/4	5-1/8
* DL517009	DX517009	9/64	.1406	3	5-3/8
* DL517010	DX517010	5/32	.1563	3	5-3/8
* DL517011	DX517011	11/64	.1719	3-3/8	5-3/4
* DL517012	DX517012	3/16	.1875	3-3/8	5-3/4
* DL517013	DX517013	13/64	.2031	3-5/8	6
* DL517014	DX517014	7/32	.2188	3-5/8	6
* DL517015	DX517015	15/64	.2344	3-3/4	6-1/8
** DL517016	DX517016	1/4	.2500	3-3/4	6-1/8
** DL517017	DX517017	17/64	.2656	3-7/8	6-1/4
** DL517018	DX517018	9/32	.2813	3-7/8	6-1/4
** DL517019	DX517019	19/64	.2969	4	6-3/8
** DL517020	DX517020	5/16	.3125	4	6-3/8
** DL517021	DX517021	21/64	.3281	4-1/8	6-1/2
** DL517022	DX517022	11/32	.3438	4-1/8	6-3/4
** DL517023	DX517023	23/64	.3594	4-1/4	6-3/4
** DL517024	DX517024	3/8	.3750	4-1/4	6-3/4
** DL517025	DX517025	25/64	.3906	4-3/8	7
** DL517026	DX517026	13/32	.4063	4-3/8	7
** DL517027	DX517027	27/64	.4219	4-5/8	7-1/4
** DL517028	DX517028	7/16	.4375	4-5/8	7-1/4
** DL517029	DX517029	29/64	.4531	4-3/4	7-1/2
** DL517030	DX517030	15/32	.4688	4-3/4	7-1/2
** DL517031	DX517031	31/64	.4844	4-3/4	7-3/4
** DL517032	DX517032	1/2	.5000	4-3/4	7-3/4

▶**Tolerance** : See page 153

* 10per package
** 5per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○			○		

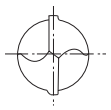
STRAIGHT SHANK DRILLS

D4107 SERIES

HSSCo8, STRAIGHT SHANK SCREW MACHINE

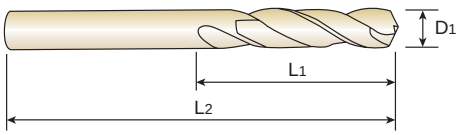
STUB

▶**Flute Geometry** : Right hand spiral helix
▶**Point Angle** : 135˚
under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN Coating
▶**Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.



under 1.6mm

1.6mm & over



DIN 1897 | HSS Co8 | N 33˚ | h8 | 135˚

P.161

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
* D4107010	1.0	.0394	6	26
* D4107011	1.1	.0433	7	28
* D4107012	1.2	.0472	8	30
* D4107912	1.25	.0492	8	30
* D4107013	1.3	.0512	8	30
* D4107014	1.4	.0551	9	32
* D4107015	1.5	.0591	9	32
* D4107016	1.6	.0630	10	34
* D4107017	1.7	.0669	10	34
* D4107917	1.75	.0689	11	36
* D4107018	1.8	.0709	11	36
* D4107019	1.9	.0748	11	36
* D4107020	2.0	.0787	12	38
* D4107021	2.1	.0827	12	38
* D4107022	2.2	.0866	13	40
* D4107925	2.25	0.886	13	40
* D4107023	2.3	.0906	13	40
* D4107024	2.4	.0945	14	43
* D4107025	2.5	.0984	14	43
* D4107026	2.6	.1024	14	43
** D4107027	2.7	.1063	16	46
** D4107927	2.75	.1083	16	46
** D4107028	2.8	.1102	16	46
** D4107029	2.9	.1142	16	46
** D4107030	3.0	.1181	16	46
** D4107031	3.1	.1220	18	49
** D4107032	3.2	.1260	18	49
** D4107932	3.25	.1280	18	49
** D4107033	3.3	.1299	18	49

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
** D4107034	3.4	.1339	20	52
** D4107035	3.5	.1378	20	52
** D4107036	3.6	.1417	20	52
** D4107037	3.7	.1457	20	52
** D4107937	3.75	.1476	20	52
** D4107038	3.8	.1496	22	55
** D4107039	3.9	.1535	22	55
** D4107040	4.0	.1575	22	55
** D4107041	4.1	.1614	22	55
** D4107042	4.2	.1654	22	55
** D4107942	4.25	.1673	22	55
** D4107043	4.3	.1693	24	58
** D4107044	4.4	.1732	24	58
** D4107045	4.5	.1772	24	58
** D4107046	4.6	.1811	24	58
** D4107946	4.65	.1831	24	58
** D4107047	4.7	.1850	24	58
** D4107947	4.75	.1870	24	58
** D4107048	4.8	.1890	26	62
** D4107049	4.9	.1929	26	62
** D4107050	5.0	.1969	26	62
** D4107051	5.1	.2008	26	62
** D4107052	5.2	.2047	26	62
** D4107952	5.25	.2067	26	62
** D4107053	5.3	.2087	26	62
** D4107054	5.4	.2126	28	66
** D4107055	5.5	.2165	28	66
** D4107955	5.55	.2185	28	66
** D4107056	5.6	.2205	28	66

▶ The HSSCo5(DL107) is available when you need.
The TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

* 10per package, ** 5per package

◎ : Excellent ○ : Good

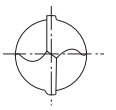
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

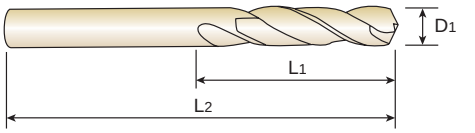
STRAIGHT SHANK DRILLS

D4107 SERIES

HSSCo8, STRAIGHT SHANK SCREW MACHINE — STUB

▶**Flute Geometry** : Right hand spiral helix
▶**Point Angle** : 135°
under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN Coating
▶**Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.





DIN 1897 | HSS Co8 | N 33° | h8 | 135° P.161

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
** D4107057	5.7	.2244	28	66
** D4107957	5.75	.2264	28	66
** D4107058	5.8	.2283	28	66
** D4107059	5.9	.2323	28	66
** D4107060	6.0	.2362	28	66
** D4107061	6.1	.2402	31	70
** D4107062	6.2	.2441	31	70
** D4107962	6.25	.2461	31	70
** D4107063	6.3	.2480	31	70
** D4107064	6.4	.2520	31	70
** D4107065	6.5	.2559	31	70
** D4107066	6.6	.2598	31	70
** D4107067	6.7	.2638	31	70
** D4107967	6.75	.2657	34	74
** D4107068	6.8	.2677	34	74
** D4107069	6.9	.2717	34	74
** D4107070	7.0	.2756	34	74
** D4107071	7.1	.2795	34	74
** D4107072	7.2	.2835	34	74
** D4107972	7.25	.2854	34	74
** D4107073	7.3	.2874	34	74
** D4107074	7.4	.2913	34	74
** D4107974	7.45	.2933	34	74
** D4107075	7.5	.2953	34	74
** D4107076	7.6	.2992	37	79
** D4107077	7.7	.3031	37	79
** D4107977	7.75	.3051	37	79
** D4107078	7.8	.3071	37	79
** D4107079	7.9	.3110	37	79

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
** D4107080	8.0	.3150	37	79
** D4107081	8.1	.3189	37	79
** D4107082	8.2	.3228	37	79
** D4107982	8.25	.3248	37	79
** D4107083	8.3	.3268	37	79
** D4107084	8.4	.3307	37	79
** D4107085	8.5	.3346	37	79
** D4107086	8.6	.3386	40	84
** D4107087	8.7	.3425	40	84
** D4107987	8.75	.3445	40	84
** D4107088	8.8	.3465	40	84
** D4107089	8.9	.3504	40	84
** D4107090	9.0	.3543	40	84
** D4107091	9.1	.3583	40	84
** D4107092	9.2	.3622	40	84
** D4107992	9.25	.3642	40	84
** D4107093	9.3	.3661	40	84
** D4107993	9.35	.3681	40	84
** D4107094	9.4	.3701	40	84
** D4107095	9.5	.3740	40	84
** D4107096	9.6	.3780	43	89
** D4107097	9.7	.3819	43	89
** D4107997	9.75	.3839	43	89
** D4107098	9.8	.3858	43	89
** D4107099	9.9	.3898	43	89
** D4107100	10.0	.3937	43	89
** D4107102	10.2	.4016	43	89
** D4107802	10.25	.4035	43	89
** D4107105	10.5	.4134	43	89

▶ The HSSCo5(DL107) is available when you need.
The TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

** 5per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

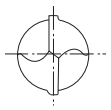
STRAIGHT SHANK DRILLS

D4107 SERIES

HSSCo8, STRAIGHT SHANK SCREW MACHINE

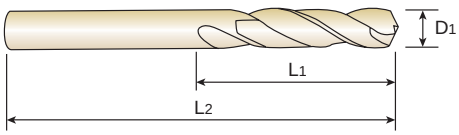
STUB

▶**Flute Geometry** : Right hand spiral helix
▶**Point Angle** : 135˚
under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface Treatment** : TiN Coating
▶**Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.



under 1.6mm

1.6mm & over



DIN 1897 | HSS Co8 | N 33˚ | h8 | 135˚

P.161

Unit : mm

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
** D4107807	10.75	.4232	47	95
** D4107110	11.0	.4330	47	95
** D4107812	11.25	.4429	47	95
** D4107115	11.5	.4527	47	95
** D4107817	11.75	.4626	47	95
** D4107118	11.8	.4645	47	95
** D4107120	12.0	.4724	51	102
** D4107822	12.25	.4823	51	102
** D4107125	12.5	.4921	51	102
** D4107827	12.75	.5020	51	102
** D4107130	13.0	.5118	51	102
– D4107832	13.25	.5217	54	107
– D4107135	13.5	.5314	54	107
– D4107837	13.75	.5413	54	107
– D4107138	13.8	.5433	54	107
– D4107140	14.0	.5512	54	107
– D4107842	14.25	.5610	56	111
– D4107145	14.5	.5708	56	111
– D4107847	14.75	.5807	56	111
– D4107150	15.0	.5905	56	111
– D4107852	15.25	.6004	58	115
– D4107155	15.5	.6102	58	115
– D4107857	15.75	.6201	58	115
– D4107160	16.0	.6299	58	115
– D4107862	16.25	.6398	60	119
– D4107165	16.5	.6495	60	119
– D4107867	16.75	.6594	60	119
– D4107170	17.0	.6692	60	119

EDP No.	Diameter		Flute Length	Overall Length
	Metric	Inch		
TiN	D1		L1	L2
– D4107872	17.25	.6791	62	123
– D4107175	17.5	.6889	62	123
– D4107877	17.75	.6907	62	123
– D4107180	18.0	.7087	62	123
– D4107882	18.25	.7185	64	127
– D4107185	18.5	.7283	64	127
– D4107887	18.75	.7382	64	127
– D4107190	19.0	.7480	64	127
– D4107892	19.25	.7579	66	131
– D4107195	19.5	.7676	66	131
– D4107897	19.75	.7776	66	131
– D4107200	20.0	.7874	66	131
– D4107205	20.5	.8071	68	136
– D4107210	21.0	.8268	68	136
– D4107215	21.5	.8465	70	141
– D4107220	22.0	.8661	70	141
– D4107225	22.5	.8858	72	146
– D4107230	23.0	.9055	72	146
– D4107235	23.5	.9252	72	146
– D4107240	24.0	.9449	75	151
– D4107245	24.5	.9646	75	151
– D4107250	25.0	.9843	75	151
– D4107260	26.0	1.0236	78	156
– D4107270	27.0	1.0630	81	162
– D4107280	28.0	1.1024	81	162
– D4107290	29.0	1.1417	84	168
– D4107300	30.0	1.1811	84	168
– D4107310	31.0	1.2205	87	174

▶ The HSSCo5(DL107) is available when you need.
The TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

** 5per package
– 1per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○		

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS

HSS & HSSCo8, STRAIGHT SHANK SCREW MACHINE DRILLS

D1118, D1115, D1119, D2146, D2147, D2148 SERIES

WORK MATERIAL	CARBON STEELS		CARBON STEELS		CARBON STEELS		ALLOY STEELS		ALLOY STEELS	
HARDNESS			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38	
STRENGTH	~ 570 N/mm²		~ 830 N/mm²		830 ~ 950 N/mm²		830 ~ 1110 N/mm²		1110 ~ 1260 N/mm²	
DIAMETER	N	S	N	S	N	S	N	S	N	S
0 ~ 3/32	3380	.0010	2550	.0010	1900	.0006	2380	.0008	1400	.0006
3/32 ~ 5/32	2700	.0020	2000	.0020	1500	.0010	1880	.0020	1100	.0008
11/64 ~ 1/4	1700	.0025	1280	.0025	960	.0015	1190	.0025	700	.0010
17/64 ~ 23/64	1050	.0051	780	.0051	590	.0030	730	.0051	430	.0015
3/8 ~ 37/64	750	.0059	560	.0060	425	.0030	520	.0070	310	.0020
19/32 ~ 1	440	.0090	330	.0090	255	.0051	300	.0090	180	.0020
1 ~	260	.0110	195	.0110	145	.0070	180	.0070	107	.0030

WORK MATERIAL	STAINLESS STEELS		TITANIUM ALLOYS		TOOL STEELS		CAST IRON		ALUMINUM ALLOYS	
HARDNESS	HRc23						~ HRc21			
STRENGTH	830 N/mm²		410 N/mm²		~ 270 N/mm²		~ 800 N/mm²			
DIAMETER	N	S	N	S	N	S	N	S	N	S
0 ~ 3/32	2550	.0010	1400	.0008	3180	.0016	2250	.0010	6400	.0015
3/32 ~ 5/32	2000	.0020	1100	.0010	2500	.0020	2000	.0020	5000	.0025
11/64 ~ 1/4	1280	.0025	700	.0015	1590	.0025	1280	.0025	3200	.0030
17/64 ~ 23/64	780	.0051	430	.0030	970	.0051	780	.0051	2000	.0070
3/8 ~ 37/64	560	.0060	430	.0030	700	.0070	560	.0060	1400	.0078
19/32 ~ 1	330	.0090	180	.0051	440	.0090	330	.0090	820	.0118
1 ~	195	.0110	107	.0070	240	.1180	195	.0110	490	.0150

WORK MATERIAL	MAGNESIUM ALLOYS		ZINC ALLOYS		PLASTIC	
HARDNESS						
STRENGTH						
DIAMETER	N	S	N	S	N	S
0 ~ 3/32	8600	.0015	6400	.0015	3380	.0010
3/32 ~ 5/32	6800	.0025	5000	.0025	2700	.0020
11/64 ~ 1/4	4300	.0030	3200	.0030	1700	.0025
17/64 ~ 23/64	2600	.0070	2000	.0070	1050	.0051
3/8 ~ 37/64	1900	.0078	1400	.0078	750	.0060
19/32 ~ 1	1100	.0118	820	.0118	440	.0090
1 ~	660	.0150	490	.0150	260	.0110

N = R.P.M
S =Inch per Revolution(inch/rev.)

HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

DN514, DN516, DN515 SERIES

WORK MATERIAL	CARBON STEELS ALLOY STEELS		TOOL STEELS HARDENED STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
HARDNESS	HRc15 ~ 30		HRc20 ~ 40					
STRENGTH	700 ~ 1000 N/mm²		800 ~ 1200 N/mm²					
DIAMETER	N	S	N	S	N	S	N	S
~ 5/64	2630	.0012	2100	.0010	4200	.0023	1680	.0500
3/32 ~ 7/64	2100	.0015	1680	.0012	3300	.0031	1310	.0023
1/8 ~ 5/32	1680	.0020	1310	.0015	2630	.0039	1050	.0031
11/64 ~ 3/16	1310	.0023	1050	.0019	2100	.0051	840	.0039
13/64 ~ 15/64	1050	.0023	840	.0019	1680	.0051	660	.0039
1/4 ~ 9/32	840	.0031	660	.0023	1310	.0063	530	.0051
19/64 ~ 11/32	660	.0039	530	.0031	1050	.0078	420	.0067
23/64 ~ 7/16	530	.0051	420	.0039	840	.0098	330	.0082
29/64 ~ 9/16	420	.0051	330	.0039	660	.0098	260	.0082
37/64 ~ 45/64	330	.0059	260	.0051	530	.0118	210	.0098
23/32 ~ 7/8	260	.0078	210	.0059	420	.0157	170	.0118
57/64 ~ 1-1/8	210	.0098	170	.0078	330	.0196	130	.0196
1-9/64 ~	170	.0098	130	.0078	260	.0196	110	.0196

N = R.P.M
S =Inch per Revolution(inch/rev.)

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS

HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL, TiCN COATED

DX517 SERIES

WORK MATERIAL	CARBON STEELS ALLOY STEELS		TOOL STEELS HARDENED STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
HARDNESS	HRc15 ~ 30		HRc20 ~ 40					
STRENGTH	700 ~ 1000 N/mm²		800 ~ 1200 N/mm²					
DIAMETER	N	S	N	S	N	S	N	S
~ 5/64	4900	.0023	3400	.0023	8500	.0027	5400	.0027
3/32 ~ 7/64	3000	.0031	2350	.0031	5700	.0043	3500	.0043
1/8 ~ 5/32	2440	.0035	1800	.0035	4300	.0055	2700	.0055
11/64 ~ 15/64	1950	.0039	1400	.0039	3450	.0055	2150	.0055
1/4 ~ 9/32	1400	.0055	1000	.0055	2450	.0078	1550	.0078
19/64 ~ 5/16	1200	.0059	850	.0059	2100	.0086	1350	.0086
21/64 ~ 23/64	1100	.0066	800	.0066	1950	.0094	1200	.0094
3/8 ~ 25/64	950	.0071	660	.0071	1750	.0110	1050	.0110
13/32 ~ 7/16	900	.0078	630	.0078	1600	.0110	960	.0110
29/64 ~ 15/32	800	.0078	575	.0078	1450	.0110	900	.0110
31/64 ~ 1/2	720	.0078	500	.0078	1300	.0110	830	.0110

N = R.P.M
S =Inch per Revolution(inch/rev.)

HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL

DL517 SERIES

WORK MATERIAL	CARBON STEELS ALLOY STEELS		TOOL STEELS HARDENED STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
HARDNESS	HRc15 ~ 30		HRc20 ~ 40					
STRENGTH	700 ~ 1000 N/mm²		800 ~ 1200 N/mm²					
DIAMETER	N	S	N	S	N	S	N	S
~ 5/64	3990	.0023	2770	.0023	6920	.0027	4400	.0027
3/32 ~ 7/64	2440	.0031	1910	.0031	4640	.0043	2850	.0043
1/8 ~ 5/32	1990	.0035	1470	.0035	3500	.0055	2200	.0055
11/64 ~ 15/64	1590	.0039	1140	.0039	2810	.0055	1750	.0055
1/4 ~ 9/32	1140	.0055	810	.0055	1990	.0078	1260	.0078
19/64 ~ 5/16	980	.0059	690	.0059	1710	.0086	1100	.0086
21/64 ~ 23/64	900	.0066	650	.0066	1590	.0094	980	.0094
3/8 ~ 25/64	770	.0071	540	.0071	1420	.0110	850	.0110
13/32 ~ 7/16	730	.0078	510	.0078	1300	.0110	780	.0110
29/64 ~ 15/32	650	.0078	470	.0078	1180	.0110	730	.0110
31/64 ~ 1/2	590	.0078	410	.0078	1060	.0110	680	.0110

N = R.P.M
S =Inch per Revolution(inch/rev.)

HSSCo8, STRAIGHT SHANK SCREW MACHINE

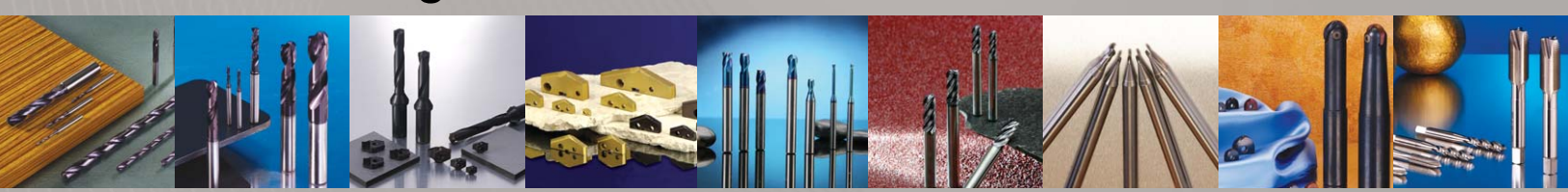
D4107 SERIES

WORK MATERIAL	CARBON STEELS		CARBON STEELS		CARBON STEELS		ALLOY STEELS		ALLOY STEELS		STAINLESS STEELS		TITANIUM ALLOYS	
HARDNESS			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38		HRc23			
STRENGTH	~ 570 N/mm²		~ 830 N/mm²		830 ~ 950 N/mm²		830 ~ 1110 N/mm²		1110 ~ 1260 N/mm²		830 N/mm²		410 N/mm²	
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S	N	S
2.5	4225	.0010	3200	.0010	2500	.0006	2980	.0008	1750	.0006	3200	.0010	1750	.0008
3.0	3375	.0020	2500	.0020	2000	.0010	2350	.0020	1375	.0008	2500	.0020	1375	.0010
5.0	2125	.0025	1600	.0025	1280	.0015	1500	.0025	875	.0010	1600	.0025	875	.0015
8.0	1310	.0051	975	.0051	785	.0030	910	.0051	535	.0015	975	.0051	535	.0030
11.0	935	.0059	700	.0059	565	.0030	650	.0071	385	.0020	700	.0059	535	.0030
19.0	550	.0091	410	.0091	340	.0051	375	.0091	225	.0020	410	.0091	225	.0051
31.0	325	.0110	244	.0110	193	.0071	225	.0071	134	.0030	244	.0110	134	.0071

WORK MATERIAL	TOOL STEELS		CAST IRON		ALUMINUM ALLOYS		MAGNESIUM ALLOYS		ZINC ALLOYS		PLASTIC	
HARDNESS			~ HRc21									
STRENGTH	~ 270 N/mm²		~ 800 N/mm²									
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S
2.5	3975	.0017	2800	.0010	7950	.0015	10700	.0015	7950	.0015	4225	.0010
3.0	3125	.0020	2500	.0020	6200	.0025	8450	.0025	6200	.0025	3350	.0020
5.0	2000	.0025	1600	.0025	3950	.0030	5350	.0030	3950	.0030	2125	.0025
8.0	1210	.0051	975	.0051	2490	.0071	3240	.0071	2490	.0071	1310	.0051
11.0	875	.0071	700	.0059	1740	.0079	2365	.0079	1740	.0079	935	.0059
19.0	550	.0091	410	.0091	1020	.0118	1370	.0118	1020	.0118	550	.0091
31.0	300	.0118	244	.0110	610	.0150	820	.0150	610	.0150	325	.0110

N = R.P.M
S =Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation

AIRCRAFT DRILLS

- 6 and 12 inch Length Drills

AIRCRAFT DRILLS

6 and 12 inch Length Drills

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
INCH					
DL601 DL604		HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Fractional sizes	D5/64	D1/2	166
DL602 DL605		HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Letter sizes	A	Z	167
DL603 DL606		HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Wire gauge sizes	#43	#1	168
D1631 D1634		HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Fractional sizes	D5/64	D1/2	169
D1632 D1635		HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Letter sizes	A	Z	170
D1633 D1636		HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Wire gauge sizes	#43	#1	171
		RECOMMENDED CUTTING CONDITIONS			172

◎ : Excellent
○ : Good

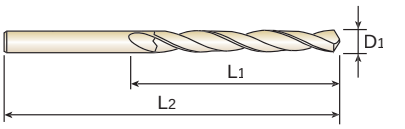
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	○				○	○	○		○	○	○
◎	○				○	○	○		○	○	○
◎	○				○	○	○		○	○	○
◎	◎	○			○	○	○	○	○	○	○
◎	◎	○			○	○	○	○	○	○	○
◎	◎	○			○	○	○	○	○	○	○

AIRCRAFT DRILLS

DL601 SERIES
DL604 SERIES

HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

▶**Flute Geometry** : Right hand spiral, 30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS Co5 | NAS 907 | 30° | 135°

P.172

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* DL601005	5/64	.0781	1	6
* DL601006	3/32	.0938	1-1/4	6
* DL601007	7/64	.1094	1-1/4	6
* DL601008	1/8	.1250	1-5/8	6
* DL601009	9/64	.1406	1-3/4	6
* DL601010	5/32	.1563	2	6
* DL601011	11/64	.1719	2-1/8	6
* DL601012	3/16	.1875	2-5/16	6
* DL601013	13/64	.2031	2-7/16	6
* DL601014	7/32	.2188	2-1/2	6
* DL601015	15/64	.2344	2-5/8	6
** DL601016	1/4	.2500	2-3/4	6
** DL601017	17/64	.2656	2-7/8	6
** DL601018	9/32	.2813	2-15/16	6
** DL601019	19/64	.2969	3-1/16	6
** DL601020	5/16	.3125	3-3/16	6
** DL601021	21/64	.3281	3-5/16	6
** DL601022	11/32	.3438	3-7/16	6
** DL601023	23/64	.3594	3-1/2	6
** DL601024	3/8	.3750	3-5/8	6
** DL601025	25/64	.3906	3-3/4	6
** DL601026	13/32	.4063	3-7/8	6
** DL601027	27/64	.4219	3-15/16	6
** DL601028	7/16	.4375	4-1/16	6

EDP No.	Diameter Fractional	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
** DL601029	29/64	.4531	4-3/16	6
** DL601030	15/32	.4688	4-5/16	6
** DL601031	31/64	.4844	4-3/8	6
** DL601032	1/2	.5000	4-1/2	6
* DL604014	7/32	.2188	2-1/2	12
* DL604015	15/64	.2344	2-5/8	12
** DL604016	1/4	.2500	2-3/4	12
** DL604017	17/64	.2656	2-7/8	12
** DL604018	9/32	.2813	2-15/16	12
** DL604019	19/64	.2969	3-1/16	12
** DL604020	5/16	.3125	3-3/16	12
** DL604021	21/64	.3281	3-5/16	12
** DL604022	11/32	.3438	3-7/16	12
** DL604023	23/64	.3594	3-1/2	12
** DL604024	3/8	.3750	3-5/8	12
** DL604025	25/64	.3906	3-3/4	12
** DL604026	13/32	.4063	3-7/8	12
** DL604027	27/64	.4219	3-15/16	12
** DL604028	7/16	.4375	4-1/16	12
** DL604029	29/64	.4531	4-3/16	12
** DL604030	15/32	.4688	4-5/16	12
** DL604031	31/64	.4844	4-3/8	12
** DL604032	1/2	.5000	4-1/2	12

* 10per package
** 5per package

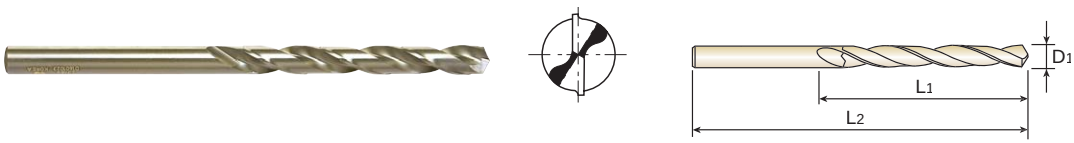
Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	○				○	○	○		○	○	○

HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

▶**Flute Geometry** : Right hand spiral, 30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS Co5 | NAS 907 | 30° | 135° P.172

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* DL602101	A	.2340	2-5 / 8	6
** DL602102	B	,2380	2-3 / 4	6
** DL602103	C	.2420	2-3 / 4	6
** DL602104	D	.2460	2-3 / 4	6
** DL602105	E	.2500	2-3 / 4	6
** DL602106	F	.2570	2-7 / 8	6
** DL602107	G	.2610	2-7 / 8	6
** DL602108	H	.2660	2-7 / 8	6
** DL602109	I	.2720	2-7 / 8	6
** DL602110	J	.2770	2-7 / 8	6
** DL602111	K	.2810	2-15 / 16	6
** DL602112	L	.2900	2-15 / 16	6
** DL602113	M	.2950	3-1 / 16	6
** DL602114	N	.3020	3-1 / 16	6
** DL602115	O	.3160	3-3 / 16	6
** DL602116	P	.3230	3-5 / 16	6
** DL602117	Q	.3320	3-7 / 16	6
** DL602118	R	.3390	3-7 / 16	6
** DL602119	S	.3480	3-1 / 2	6
** DL602120	T	.3580	3-1 / 2	6
** DL602121	U	.3680	3-5 / 8	6
** DL602122	V	.3770	3-5 / 8	6
** DL602123	W	.3860	3-3 / 4	6
** DL602124	X	.3970	3-3 / 4	6
** DL602125	Y	.4040	3-7 / 8	6
** DL602126	Z	.4130	3-7 / 8	6

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* DL605101	A	.2340	2-5 / 8	12
** DL605102	B	,2380	2-3 / 4	12
** DL605103	C	.2420	2-3 / 4	12
** DL605104	D	.2460	2-3 / 4	12
** DL605105	E	.2500	2-3 / 4	12
** DL605106	F	.2570	2-7 / 8	12
** DL605107	G	.2610	2-7 / 8	12
** DL605108	H	.2660	2-7 / 8	12
** DL605109	I	.2720	2-7 / 8	12
** DL605110	J	.2770	2-7 / 8	12
** DL605111	K	.2810	2-15 / 16	12
** DL605112	L	.2900	2-15 / 16	12
** DL605113	M	.2950	3-1 / 16	12
** DL605114	N	.3020	3-1 / 16	12
** DL605115	O	.3160	3-3 / 16	12
** DL605116	P	.3230	3-5 / 16	12
** DL605117	Q	.3320	3-7 / 16	12
** DL605118	R	.3390	3-7 / 16	12
** DL605119	S	.3480	3-1 / 2	12
** DL605120	T	.3580	3-1 / 2	12
** DL605121	U	.3680	3-5 / 8	12
** DL605122	V	.3770	3-5 / 8	12
** DL605123	W	.3860	3-3 / 4	12
** DL605124	X	.3970	3-3 / 4	12
** DL605125	Y	.4040	3-7 / 8	12
** DL605126	Z	.4130	3-7 / 8	12

▶**Tolerance** : See page 166

* 10per package
** 5per package

◎ : Excellent ○ : Good

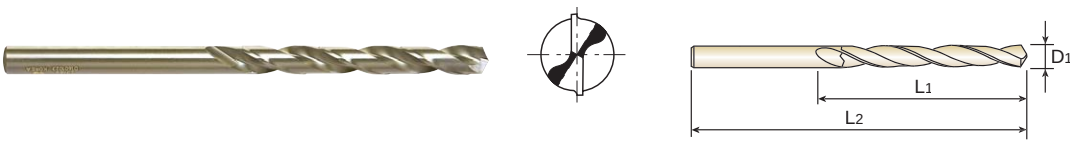
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	○				○	○	○		○	○	○

AIRCRAFT DRILLS

DL603 SERIES
DL606 SERIES

HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

▶**Flute Geometry** : Right hand spiral, PARABOLIC FLUTE
30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS Co5 | NAS 907 | 30° | 135° | P.172

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* DL603256	1	.2280	2-5 / 8	6
* DL603255	2	.2210	2-5 / 8	6
* DL603254	3	.2130	2-1 / 2	6
* DL603253	4	.2090	2-1 / 2	6
* DL603252	5	.2055	2-1 / 2	6
* DL603251	6	.2040	2-1 / 2	6
* DL603250	7	.2010	2-7 / 16	6
* DL603249	8	.1990	2-7 / 16	6
* DL603248	9	.1960	2-7 / 16	6
* DL603247	10	.1935	2-7 / 16	6
* DL603246	11	.1910	2-5 / 16	6
* DL603245	12	.1890	2-5 / 16	6
* DL603244	13	.1850	2-5 / 16	6
* DL603243	14	.1820	2-3 / 16	6
* DL603242	15	.1800	2-3 / 16	6
* DL603241	16	.1770	2-3 / 16	6
* DL603240	17	.1730	2-3 / 16	6
* DL603239	18	.1695	2-1 / 8	6
* DL603238	19	.1660	2-1 / 8	6
* DL603237	20	.1610	2-1 / 8	6
* DL603236	21	.1590	2-1 / 8	6
* DL603235	22	.1570	2	6
* DL603234	23	.1540	2	6

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* DL603233	24	.1520	2	6
* DL603232	25	.1495	1-7 / 8	6
* DL603231	26	.1470	1-7 / 8	6
* DL603230	27	.1440	1-7 / 8	6
* DL603229	28	.1405	1-3 / 4	6
* DL603228	29	.1360	1-3 / 4	6
* DL603227	30	.1280	1-5 / 8	6
* DL603226	31	.1200	1-5 / 8	6
* DL603225	32	.1160	1-5 / 8	6
* DL603224	33	.1130	1-1 / 2	6
* DL603223	34	.1110	1-1 / 2	6
* DL603222	35	.1100	1-1 / 2	6
* DL603221	36	.1065	1-7 / 16	6
* DL603220	37	.1040	1-7 / 16	6
* DL603219	38	.1015	1-7 / 16	6
* DL603218	39	.0995	1-3 / 8	6
* DL603217	40	.0980	1-3 / 8	6
* DL603216	41	.0960	1-3 / 8	6
* DL603215	42	.0935	1-1 / 4	6
* DL603214	43	.0890	1-1 / 4	6
* DL606256	1	.2280	2-5 / 8	12
* DL606254	3	.2130	2-1 / 2	12

* 10per package

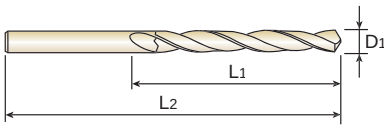
Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	○				○	○	○		○	○	○

HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

▶**Flute Geometry** : Right hand spiral, 30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS NAS 907 30° 135° P.172

▶ Fractional sizes

Unit : Inch

EDP No.	Diameter Fractional	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1631005	5/64	.0781	1	6
* D1631006	3/32	.0938	1-1/4	6
* D1631007	7/64	.1094	1-1/4	6
* D1631008	1/8	.1250	1-5/8	6
* D1631009	9/64	.1406	1-3/4	6
* D1631010	5/32	.1563	2	6
* D1631011	11/64	.1719	2-1/8	6
* D1631012	3/16	.1875	2-5/16	6
* D1631013	13/64	.2031	2-7/16	6
* D1631014	7/32	.2188	2-1/2	6
* D1631015	15/64	.2344	2-5/8	6
** D1631016	1/4	.2500	2-3/4	6
** D1631017	17/64	.2656	2-7/8	6
** D1631018	9/32	.2813	2-15/16	6
** D1631019	19/64	.2969	3-1/16	6
** D1631020	5/16	.3125	3-3/16	6
** D1631021	21/64	.3281	3-5/16	6
** D1631022	11/32	.3438	3-7/16	6
** D1631023	23/64	.3594	3-1/2	6
** D1631024	3/8	.3750	3-5/8	6
** D1631025	25/64	.3906	3-3/4	6
** D1631026	13/32	.4063	3-7/8	6
** D1631027	27/64	.4219	3-15/16	6
** D1631028	7/16	.4375	4-1/16	6
** D1631029	29/64	.4531	4-3/16	6
** D1631030	15/32	.4688	4-5/16	6
** D1631031	31/64	.4844	4-3/8	6
** D1631032	1/2	.5000	4-1/2	6
* D1634014	7/32	.2188	2-1/2	12
* D1634015	15/64	.2344	2-5/8	12
** D1634016	1/4	.2500	2-3/4	12
** D1634017	17/64	.2656	2-7/8	12
** D1634018	9/32	.2813	2-15/16	12
** D1634019	19/64	.2969	3-1/16	12
** D1634020	5/16	.3125	3-3/16	12
** D1634021	21/64	.3281	3-5/16	12
** D1634022	11/32	.3438	3-7/16	12
** D1634023	23/64	.3594	3-1/2	12
** D1634024	3/8	.3750	3-5/8	12
** D1634025	25/64	.3906	3-3/4	12
** D1634026	13/32	.4063	3-7/8	12
** D1634027	27/64	.4219	3-15/16	12
** D1634028	7/16	.4375	4-1/16	12
** D1634029	29/64	.4531	4-3/16	12
** D1634030	15/32	.4688	4-5/16	12
** D1634031	31/64	.4844	4-3/8	12
** D1634032	1/2	.5000	4-1/2	12

* 10per package
** 5per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

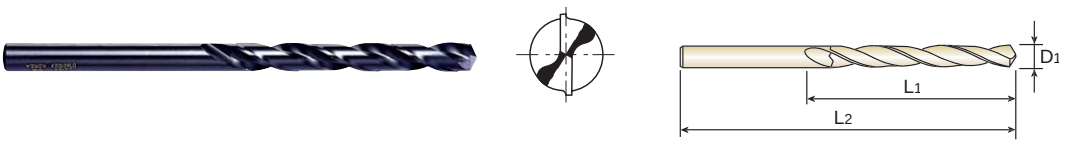
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	○	○	○	○

AIRCRAFT DRILLS

D1632 SERIES
D1635 SERIES

HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

▶**Flute Geometry** : Right hand spiral, 30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS | NAS 907 | 30° | 135°

P.172

▶ Letter sizes

Unit : Inch

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1632101	A	.2340	2-5 / 8	6
** D1632102	B	,2380	2-3 / 4	6
** D1632103	C	.2420	2-3 / 4	6
** D1632104	D	.2460	2-3 / 4	6
** D1632105	E	.2500	2-3 / 4	6
** D1632106	F	.2570	2-7 / 8	6
** D1632107	G	.2610	2-7 / 8	6
** D1632108	H	.2660	2-7 / 8	6
** D1632109	I	.2720	2-7 / 8	6
** D1632110	J	.2770	2-7 / 8	6
** D1632111	K	.2810	2-15 / 16	6
** D1632112	L	.2900	2-15 / 16	6
** D1632113	M	.2950	3-1 / 16	6
** D1632114	N	.3020	3-1 / 16	6
** D1632115	O	.3160	3-3 / 16	6
** D1632116	P	.3230	3-5 / 16	6
** D1632117	Q	.3320	3-7 / 16	6
** D1632118	R	.3390	3-7 / 16	6
** D1632119	S	.3480	3-1 / 2	6
** D1632120	T	.3580	3-1 / 2	6
** D1632121	U	.3680	3-5 / 8	6
** D1632122	V	.3770	3-5 / 8	6
** D1632123	W	.3860	3-3 / 4	6
** D1632124	X	.3970	3-3 / 4	6
** D1632125	Y	.4040	3-7 / 8	6
** D1632126	Z	.4130	3-7 / 8	6

EDP No.	Diameter Letter	Diameter Decimal	Flute Length	Overall Length
	D1		L1	L2
* D1635101	A	.2340	2-5 / 8	12
** D1635102	B	,2380	2-3 / 4	12
** D1635103	C	.2420	2-3 / 4	12
** D1635104	D	.2460	2-3 / 4	12
** D1635105	E	.2500	2-3 / 4	12
** D1635106	F	.2570	2-7 / 8	12
** D1635107	G	.2610	2-7 / 8	12
** D1635108	H	.2660	2-7 / 8	12
** D1635109	I	.2720	2-7 / 8	12
** D1635110	J	.2770	2-7 / 8	12
** D1635111	K	.2810	2-15 / 16	12
** D1635112	L	.2900	2-15 / 16	12
** D1635113	M	.2950	3-1 / 16	12
** D1635114	N	.3020	3-1 / 16	12
** D1635115	O	.3160	3-3 / 16	12
** D1635116	P	.3230	3-5 / 16	12
** D1635117	Q	.3320	3-7 / 16	12
** D1635118	R	.3390	3-7 / 16	12
** D1635119	S	.3480	3-1 / 2	12
** D1635120	T	.3580	3-1 / 2	12
** D1635121	U	.3680	3-5 / 8	12
** D1635122	V	.3770	3-5 / 8	12
** D1635123	W	.3860	3-3 / 4	12
** D1635124	X	.3970	3-3 / 4	12
** D1635125	Y	.4040	3-7 / 8	12
** D1635126	Z	.4130	3-7 / 8	12

▶**Tolerance** : See page 166

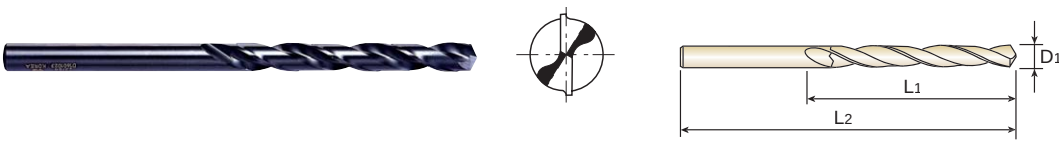
* 10per package
** 5per package

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	○	○	○	○

HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

▶**Flute Geometry** : Right hand spiral, 30° helix
▶**Point Angle** : 135°:Split point
▶**Application** : Improved chip removal in most materials, especially in deep drilling applications.



HSS | NAS 907 | 30° | 135° | P.172

▶ Wire gauge sizes

Unit : Inch

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* D1633256	1	.2280	2-5 / 8	6
* D1633255	2	.2210	2-5 / 8	6
* D1633254	3	.2130	2-1 / 2	6
* D1633253	4	.2090	2-1 / 2	6
* D1633252	5	.2055	2-1 / 2	6
* D1633251	6	.2040	2-1 / 2	6
* D1633250	7	.2010	2-7 / 16	6
* D1633249	8	.1990	2-7 / 16	6
* D1633248	9	.1960	2-7 / 16	6
* D1633247	10	.1935	2-7 / 16	6
* D1633246	11	.1910	2-5 / 16	6
* D1633245	12	.1890	2-5 / 16	6
* D1633244	13	.1850	2-5 / 16	6
* D1633243	14	.1820	2-3 / 16	6
* D1633242	15	.1800	2-3 / 16	6
* D1633241	16	.1770	2-3 / 16	6
* D1633240	17	.1730	2-3 / 16	6
* D1633239	18	.1695	2-1 / 8	6
* D1633238	19	.1660	2-1 / 8	6
* D1633237	20	.1610	2-1 / 8	6
* D1633236	21	.1590	2-1 / 8	6
* D1633235	22	.1570	2	6
* D1633234	23	.1540	2	6

EDP No.	Diameter		Flute Length	Overall Length
	Wire gauge	Decimal	D1	
			L1	L2
* D1633233	24	.1520	2	6
* D1633232	25	.1495	1-7 / 8	6
* D1633231	26	.1470	1-7 / 8	6
* D1633230	27	.1440	1-7 / 8	6
* D1633229	28	.1405	1-3 / 4	6
* D1633228	29	.1360	1-3 / 4	6
* D1633227	30	.1280	1-5 / 8	6
* D1633226	31	.1200	1-5 / 8	6
* D1633225	32	.1160	1-5 / 8	6
* D1633224	33	.1130	1-1 / 2	6
* D1633223	34	.1110	1-1 / 2	6
* D1633222	35	.1100	1-1 / 2	6
* D1633221	36	.1065	1-7 / 16	6
* D1633220	37	.1040	1-7 / 16	6
* D1633219	38	.1015	1-7 / 16	6
* D1633218	39	.0995	1-3 / 8	6
* D1633217	40	.0980	1-3 / 8	6
* D1633216	41	.0960	1-3 / 8	6
* D1633215	42	.0935	1-1 / 4	6
* D1633214	43	.0890	1-1 / 4	6
* D1636256	1	.2280	2-5 / 8	12
* D1636254	3	.2130	2-1 / 2	12

* 10per package

Tolerance Diameter (Inch)	
up to 1/8(.1250)	0 ~ −.0005
over 1/8(.1250) up to 1/4(.2500)	0 ~ −.0007
over 1/4(.2500) up to 1/2(.5000)	0 ~ −.0010

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○	○	○	○	○

HSS & HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT

DL601, DL602, DL603, D1631, D1632, D1633 SERIES

WORK MATERIAL	CARBON STEELS		CARBON STEELS		CARBON STEELS		ALLOY STEELS		ALLOY STEELS	
HARDNESS			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38	
STRENGTH	~ 570 N/mm²		~ 830 N/mm²		830 ~ 950 N/mm²		830 ~ 1110 N/mm²		1110 ~ 1260 N/mm²	
DIAMETER	N	S	N	S	N	S	N	S	N	S
0 ~ 3/32	3380	.0010	2550	.0010	1900	.0006	2380	.0008	1400	.0006
3/32 ~ 5/32	2700	.0020	2000	.0020	1500	.0010	1880	.0020	1100	.0008
11/64 ~ 1/4	1700	.0025	1280	.0025	960	.0015	1190	.0025	700	.0010
17/64 ~ 23/64	1050	.0051	780	.0051	590	.0030	730	.0051	430	.0015
3/8 ~ 37/64	750	.0059	560	.0060	425	.0030	520	.0070	310	.0020
19/32 ~ 1	440	.0090	330	.0090	255	.0051	300	.0090	180	.0020
1 ~	260	.0110	195	.0110	145	.0070	180	.0070	107	.0030

WORK MATERIAL	STAINLESS STEELS		TITANIUM ALLOYS		TOOL STEELS		CAST IRON		ALUMINUM ALLOYS	
HARDNESS	HRc23						~ HRc21			
STRENGTH	830 N/mm²		410 N/mm²		~ 270 N/mm²		~ 800 N/mm²			
DIAMETER	N	S	N	S	N	S	N	S	N	S
0 ~ 3/32	2550	.0010	1400	.0008	3180	.0016	2250	.0010	6400	.0015
3/32 ~ 5/32	2000	.0020	1100	.0010	2500	.0020	2000	.0020	5000	.0025
11/64 ~ 1/4	1280	.0025	700	.0015	1590	.0025	1280	.0025	3200	.0030
17/64 ~ 23/64	780	.0051	430	.0030	970	.0051	780	.0051	2000	.0070
3/8 ~ 37/64	560	.0060	430	.0030	700	.0070	560	.0060	1400	.0078
19/32 ~ 1	330	.0090	180	.0051	440	.0090	330	.0090	820	.0118
1 ~	195	.0110	107	.0070	240	.1180	195	.0110	490	.0150

WORK MATERIAL	MAGNESIUM ALLOYS		ZINC ALLOYS		PLASTIC	
HARDNESS						
STRENGTH						
DIAMETER	N	S	N	S	N	S
0 ~ 3/32	8600	.0015	6400	.0015	3380	.0010
3/32 ~ 5/32	6800	.0025	5000	.0025	2700	.0020
11/64 ~ 1/4	4300	.0030	3200	.0030	1700	.0025
17/64 ~ 23/64	2600	.0070	2000	.0070	1050	.0051
3/8 ~ 37/64	1900	.0078	1400	.0078	750	.0060
19/32 ~ 1	1100	.0118	820	.0118	440	.0090
1 ~	660	.0150	490	.0150	260	.0110

N = R.P.M
S =Inch per Revolution(inch/rev.)

HSS

Being the best through innovation

SILVER & DEMING DRILLS

- 118° Split Point
  3 Flats Black and Gold

HSS SILVER & DEMING DRILLS

118° Split Point
3 Flat Black and Gold

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
INCH					
D1191		HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS	D1/2	D1-1/2	176
		RECOMMENDED CUTTING CONDITIONS			177

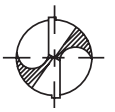
◎ : Excellent
○ : Good

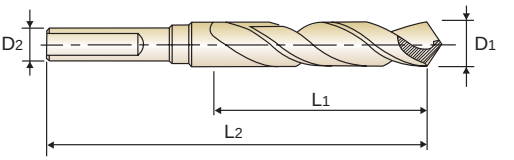
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○		○		

SILVER & DEMING DRILLS

D1191 SERIES

HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS





ANSI HSS 30~35° h8 118° P.177

Unit : Inch

EDP No.	Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D1191032	1/2	1/2	3	6
D1191033	33/64	1/2	3	6
D1191034	17/32	1/2	3	6
D1191035	35/64	1/2	3	6
D1191036	9/16	1/2	3	6
D1191037	37/64	1/2	3	6
D1191038	19/32	1/2	3	6
D1191039	39/64	1/2	3	6
D1191040	5/8	1/2	3	6
D1191041	41/64	1/2	3	6
D1191042	21/32	1/2	3	6
D1191043	43/64	1/2	3	6
D1191044	11/16	1/2	3	6
D1191045	45/64	1/2	3	6
D1191046	23/32	1/2	3	6
D1191047	47/64	1/2	3	6
D1191048	3/4	1/2	3	6
D1191049	49/64	1/2	3	6
D1191050	25/32	1/2	3	6
D1191051	51/64	1/2	3	6
D1191052	13/16	1/2	3	6
D1191053	53/64	1/2	3	6
D1191054	27/32	1/2	3	6
D1191055	55/64	1/2	3	6
D1191056	7/8	1/2	3	6
D1191057	57/64	1/2	3	6
D1191058	29/32	1/2	3	6
D1191059	59/64	1/2	3	6
D1191060	15/16	1/2	3	6

EDP No.	Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
D1191061	61/64	1/2	3	6
D1191062	31/32	1/2	3	6
D1191063	63/64	1/2	3	6
D1191064	1	1/2	3	6
D1191101	1-1/64	1/2	3	6
D1191102	1-1/32	1/2	3	6
D1191103	1-3/64	1/2	3	6
D1191104	1-1/16	1/2	3	6
D1191105	1-5/64	1/2	3	6
D1191106	1-3/32	1/2	3	6
D1191107	1-7/64	1/2	3	6
D1191108	1-1/8	1/2	3	6
D1191109	1-9/64	1/2	3	6
D1191110	1-5/32	1/2	3	6
D1191111	1-11/64	1/2	3	6
D1191112	1-3/16	1/2	3	6
D1191113	1-13/64	1/2	3	6
D1191114	1-7/32	1/2	3	6
D1191115	1-15/64	1/2	3	6
D1191116	1-1/4	1/2	3	6
D1191118	1-9/32	1/2	3	6
D1191120	1-5/16	1/2	3	6
D1191122	1-11/32	1/2	3	6
D1191124	1-3/8	1/2	3	6
D1191126	1-13/32	1/2	3	6
D1191128	1-7/16	1/2	3	6
D1191130	1-15/32	1/2	3	6
D1191132	1-1/2	1/2	3	6

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○		○		

HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS

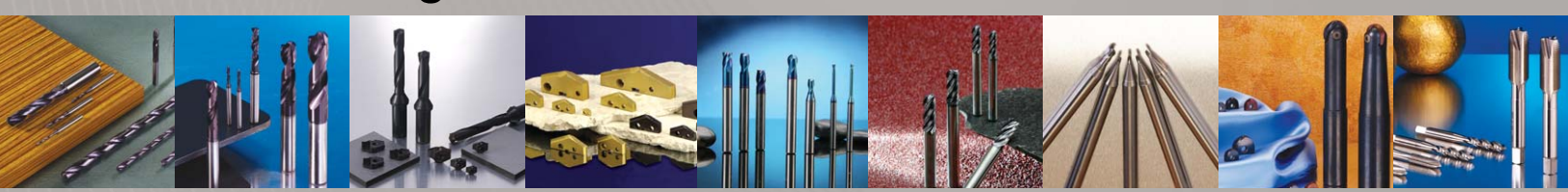
D1191 SERIES

WORK MATERIAL	CARBON STEELS		CARBON STEELS		CARBON STEELS		ALLOY STEELS		ALLOY STEELS		STAINLESS STEELS	
HARDNESS			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38		HRc23	
STRENGTH	~ 570 N/mm²		~ 830 N/mm²		830 ~ 950 N/mm²		830 ~ 1110 N/mm²		1110 ~ 1260 N/mm²		830 N/mm²	
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S
1 / 2	645	.0067	480	.0067	370	.0035	440	.0067	265	.0020	480	.0067
3 / 4	440	.0091	330	.0091	255	.0051	300	.0091	180	.0020	330	.0091
1	325	.0110	245	.0110	185	.0063	220	.0110	133	.0030	245	.0110
1-9 / 32	260	.0110	195	.0110	145	.0071	180	.0110	107	.0030	195	.0110
1-1 / 2	220	.0130	165	.0130	120	.0076	150	.0130	90	.0030	165	.0130

WORK MATERIAL	TOOL STEELS		CAST IRON		ALUMINUM ALLOYS		MAGNESIUM ALLOYS		ZINC ALLOYS		PLASTIC	
HARDNESS			~ HRc21									
STRENGTH	~ 270 N/mm²		~ 800 N/mm²									
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S
1 / 2	645	.0067	480	.0067	1200	.0100	1600	.0100	1200	.0100	645	.0067
3 / 4	440	.0091	330	.0091	820	.0118	1100	.0118	820	.0118	440	.0091
1	325	.0110	245	.0110	605	.0146	810	.0150	605	.0146	325	.0110
1-9 / 32	240	.0118	195	.0110	490	.0150	660	.0150	490	.0150	260	.0110
1-1 / 2	198	.0121	165	.0130	410	.0172	550	.0180	410	.0172	220	.0130

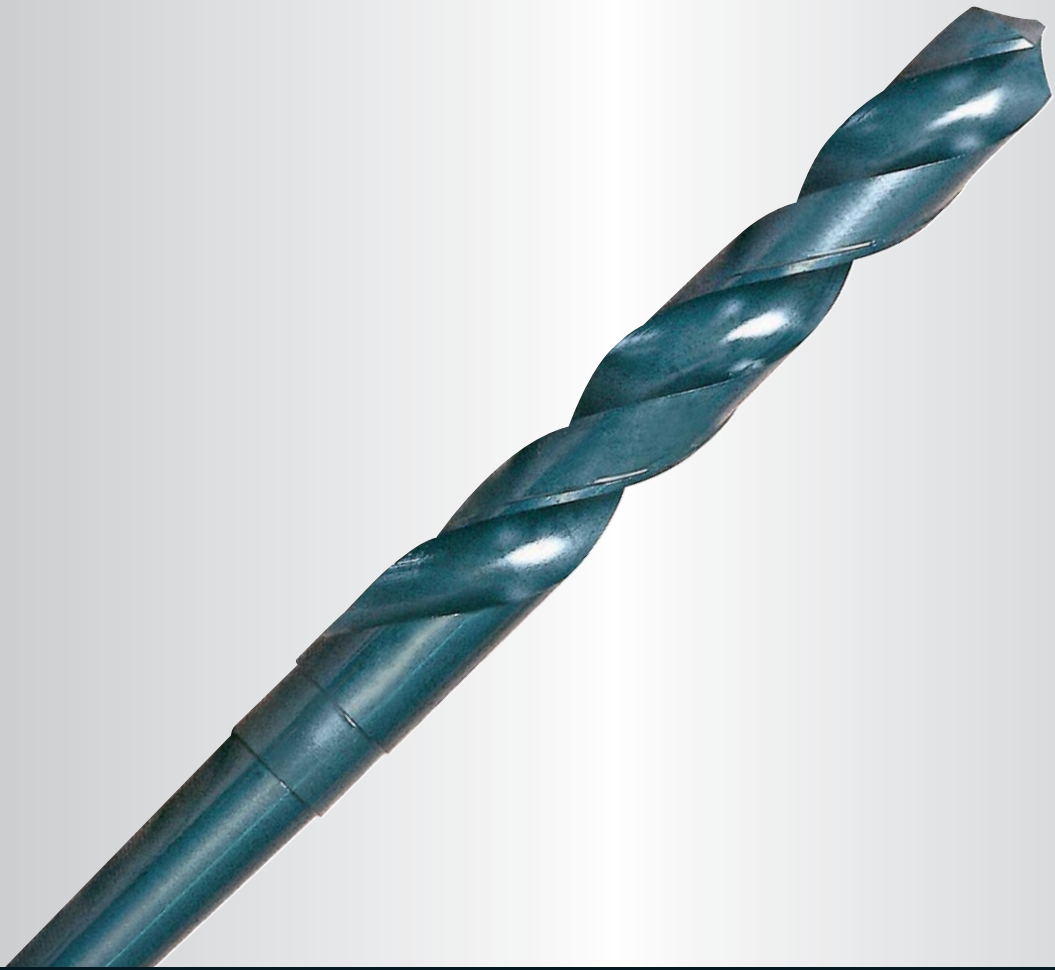
N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation



MORSE TAPER SHANK DRILLS

- **General Purpose**
  Standard Length

HSS MORSE TAPER SHANK DRILLS

General Purpose
Standard Length

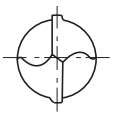
◎ : Excellent
○ : Good

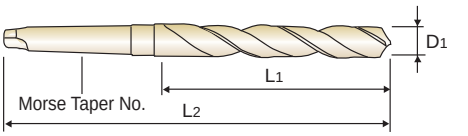
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○		○		

MORSE TAPER SHANK DRILLS

D1211 SERIES

HSS(M2) MORSE TAPER SHANK TWIST DRILL





ANSI HSS 30~35° 2~5 h8 118° P.184

Unit : Inch

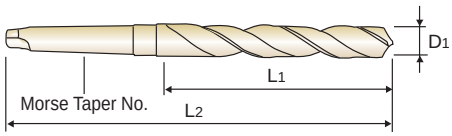
EDP No.	Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1211032	1/2	4-3/8	8-1/4	2
D1211033	33/64	4-5/8	8-1/2	2
D1211034	17/32	4-5/8	8-1/2	2
D1211035	35/64	4-7/8	8-3/4	2
D1211036	9/16	4-7/8	8-3/4	2
D1211037	37/64	4-7/8	8-3/4	2
D1211038	19/32	4-7/8	8-3/4	2
D1211039	39/64	4-7/8	8-3/4	2
D1211040	5/8	4-7/8	8-3/4	2
D1211041	41/64	5-1/8	9	2
D1211042	21/32	5-1/8	9	2
D1211043	43/64	5-3/8	9-1/4	2
D1211044	11/16	5-3/8	9-1/4	2
D1211045	45/64	5-5/8	9-1/2	2
D1211046	23/32	5-5/8	9-1/2	2
D1211047	47/64	5-7/8	9-3/4	2
D1211048	3/4	5-7/8	9-3/4	2
D1211049	49/64	6	9-7/8	2
D1211050	25/32	6	9-7/8	2
D1211051	51/64	6-1/8	10-3/4	3
D1211052	13/16	6-1/8	10-3/4	3
D1211053	53/64	6-1/8	10-3/4	3
D1211054	27/32	6-1/8	10-3/4	3
D1211055	55/64	6-1/8	10-3/4	3
D1211056	7/8	6-1/8	10-3/4	3
D1211057	57/64	6-1/8	10-3/4	3
D1211058	29/32	6-1/8	10-3/4	3
D1211059	59/64	6-1/8	10-3/4	3
D1211060	15/16	6-1/8	10-3/4	3

EDP No.	Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1211061	61/64	6-3/8	11	3
D1211062	31/32	6-3/8	11	3
D1211063	63/64	6-3/8	11	3
D1211100	1	6-3/8	11	3
D1211101	1-1/64	6-1/2	11-1/8	3
D1211102	1-1/32	6-1/2	11-1/8	3
D1211103	1-3/64	6-5/8	11-1/4	3
D1211104	1-1/16	6-5/8	11-1/4	3
D1211105	1-5/64	6-7/8	12-1/2	4
D1211106	1-3/32	6-7/8	12-1/2	4
D1211107	1-7/64	7-1/8	12-3/4	4
D1211108	1-1/8	7-1/8	12-3/4	4
D1211109	1-9/64	7-1/4	12-7/8	4
D1211110	1-5/32	7-1/4	12-7/8	4
D1211111	1-11/64	7-3/8	13	4
D1211112	1-3/16	7-3/8	13	4
D1211113	1-13/64	7-1/2	13-1/8	4
D1211114	1-7/32	7-1/2	13-1/8	4
D1211115	1-15/64	7-7/8	13-1/2	4
D1211116	1-1/4	7-7/8	13-1/2	4
D1211117	1-17/64	8-1/2	14-1/8	4
D1211118	1-9/32	8-1/2	14-1/8	4
D1211119	1-19/64	8-5/8	14-1/4	4
D1211120	1-5/16	8-5/8	14-1/4	4
D1211121	1-21/64	8-3/4	14-3/8	4
D1211122	1-11/32	8-3/4	14-3/8	4
D1211123	1-23/64	8-7/8	14-1/2	4
D1211124	1-3/8	8-7/8	14-1/2	4
D1211126	1-13/32	9	14-5/8	4

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○		○		

HSS(M2) MORSE TAPER SHANK TWIST DRILL



ANSI | HSS | 30~35° | 2 ~ 5 | h8 | 118° P.184

Unit : Inch

EDP No.	Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1211128	1-7/16	9-1/8	14-3/4	4
D1211130	1-15/32	9-1/4	14-7/8	4
D1211132	1-1/2	9-3/8	15	4
D1211133	1-33/64	9-3/8	16-3/8	4
D1211134	1-17/32	9-3/8	16-3/8	5
D1211136	1-9/16	9-5/8	16-5/8	5
D1211138	1-19/32	9-7/8	16-7/8	5
D1211140	1-5/8	10	17	5
D1211142	1-21/32	10-1/8	17-1/8	5
D1211144	1-11/16	10-1/8	17-1/8	5
D1211146	1-23/32	10-1/8	17-1/8	5
D1211148	1-3/4	10-1/8	17-1/8	5
D1211152	1-13/16	10-1/8	17-1/8	5
D1211154	1-27/32	10-1/8	17-1/8	5
D1211156	1-7/8	10-3/8	17-3/8	5

EDP No.	Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1211160	1-15/16	10-3/8	17-3/8	5
D1211162	1-31/32	10-3/8	17-3/8	5
D1211200	2	10-3/8	17-3/8	5
D1211202	2-1/32	10-3/8	17-3/8	5
D1211204	2-1/16	10-1/4	17-3/8	5
D1211206	2-3/32	10-1/4	17-3/8	5
D1211208	2-1/8	10-1/4	17-3/8	5
D1211210	2-5/32	10-1/4	17-3/8	5
D1211212	2-3/16	10-1/4	17-3/8	5
D1211214	2-7/32	10-1/8	17-3/8	5
D1211216	2-1/4	10-1/8	17-3/8	5
D1211220	2-5/16	10-1/8	17-3/8	5
D1211224	2-3/8	10-1/8	17-3/8	5
D1211228	2-7/16	11-1/4	18-3/4	5
D1211232	2-1/2	11-1/4	18-3/4	5

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎	○			○	○	○		○		

MORSE TAPER SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS

HSS(M2) MORSE TAPER SHANK TWIST DRILL

D1211 SERIES

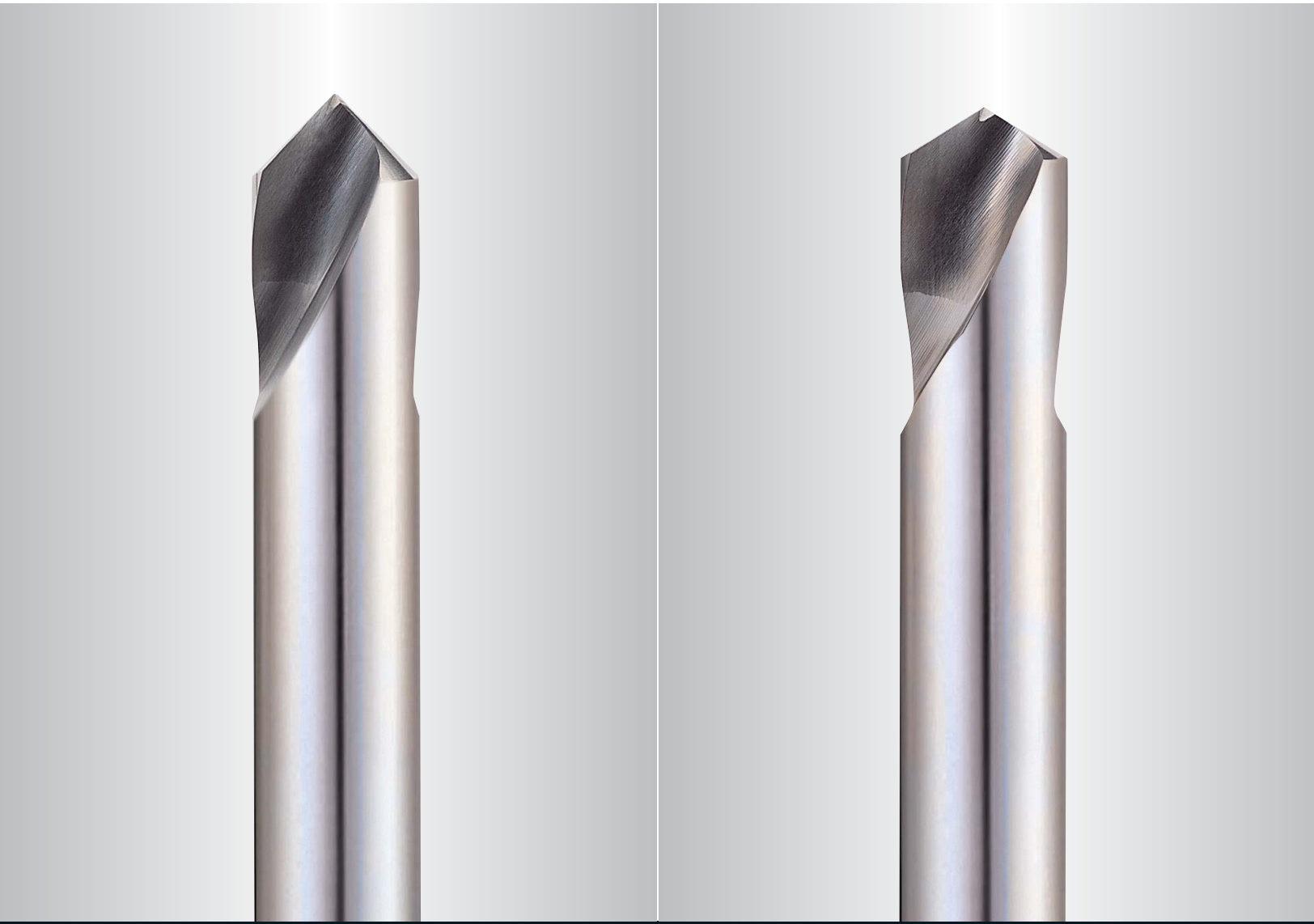
WORK MATERIAL	CARBON STEELS		CARBON STEELS		CARBON STEELS		ALLOY STEELS		ALLOY STEELS		STAINLESS STEELS	
HARDNESS			~ HRc23		~ HRc23 ~ 28		HRc23 ~ 34		HRc34 ~ 38		HRc23	
STRENGTH	~ 570 N/mm²		~ 830 N/mm²		830 ~ 950 N/mm²		830 ~ 1110 N/mm²		1110 ~ 1260 N/mm²		830 N/mm²	
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S
1 / 2	645	.0067	480	.0067	370	.0035	440	.0067	265	.0020	480	.0067
3 / 4	440	.0091	330	.0091	255	.0051	300	.0091	180	.0020	330	.0091
1	325	.0110	245	.0110	185	.0063	220	.0110	133	.0030	245	.0110
1-17 / 64	260	.0110	195	.0110	145	.0071	180	.0110	107	.0030	195	.0110
1-1 / 2	220	.0130	165	.0130	120	.0076	150	.0130	90	.0030	165	.0130
1-31 / 32	165	.0130	125	.0130	93	.0079	115	.0130	68	.0030	125	.0130
2-3 / 8	140	.0157	105	.0157	78	.0091	95	.0157	57	.0039	105	.0157

WORK MATERIAL	TOOL STEELS		CAST IRON		ALUMINUM ALLOYS		MAGNESIUM ALLOYS		ZINC ALLOYS		PLASTIC	
HARDNESS			~ HRc21									
STRENGTH	~ 270 N/mm²		~ 800 N/mm²									
DIAMETER	N	S	N	S	N	S	N	S	N	S	N	S
1 / 2	645	.0067	480	.0067	1200	.0100	1600	.0100	1200	.0100	645	.0067
3 / 4	440	.0091	330	.0091	820	.0118	1100	.0118	820	.0118	440	.0091
1	325	.0110	245	.0110	605	.0146	810	.0150	605	.0146	325	.0110
1-17 / 64	240	.0118	195	.0110	490	.0150	660	.0150	490	.0150	260	.0110
1-1 / 2	198	.0121	165	.0130	410	.0172	550	.0180	410	.0172	220	.0130
1-31 / 32	150	.0169	125	.0130	310	.0181	415	.0181	310	.0181	165	.0130
2-3 / 8	125	.0188	105	.0157	260	.0196	345	.0196	260	.0196	140	.0157

N = R.P.M
S = Inch per Revolution(inch/rev.)

HSS

Being the best through innovation



NC-SPOTTING DRILLS

- HSS(8% COBALT)
Centering and Chamfering of Holes

HSS(8% Cobalt) NC-SPOTTING DRILLS

Centering and Chamfering of Holes

ITEM	MODEL	DESCRIPTION	SIZE MIN	SIZE MAX	PAGE
INCH					
D2N90		HSSCo8, NC-SPOTTING DRILLS 90°	D1/8	D1	188
		HSSCo8, NC-SPOTTING DRILLS 120°	D1/8	D1	188
		RECOMMENDED CUTTING CONDITIONS			189

◎ : Excellent
○ : Good

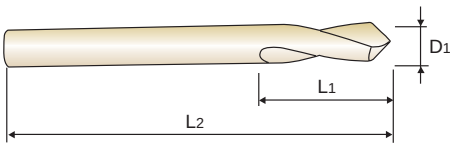
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○		○		○
◎	◎					○	○		○		○

NC-SPOTTING DRILLS

D2N90 SERIES

HSSCo8, NC-SPOTTING DRILLS

▶**Application** : For more precise centering work on NC/CNC machine. A larger diameter in respect to the subsequent drilling tool permit to obtain the centering and chamfering simultaneously.



NC | HSS Co8 | h6 | h6 | 90° | 120°

P.189

NC-Spotting drills 90°

Unit : Inch

EDP No.	Diameter	Flute Length	Overall Length
	D1	L1	L2
0081L	1/8	0.472	1.93
0121L	3/16	0.590	2.44
0161L	1/4	0.669	2.76
0201L	5/16	0.984	3.11
0241L	3/8	0.827	3.50
0321L	1/2	0.984	4.02
0401L	5/8	1.575	4.53
0481L	3/4	1.968	5.16
0641L	1	1.968	6.14

NC-Spotting drills 120°

EDP No.	Diameter	Flute Length	Overall Length
	D1	L1	L2
2081L	1/8	0.472	1.93
2121L	3/16	0.590	2.44
2161L	1/4	0.669	2.76
2201L	5/16	0.984	3.11
2241L	3/8	0.827	3.50
2321L	1/2	0.984	4.02
2401L	5/8	1.575	4.53
2481L	3/4	1.968	5.16
2641L	1	1.968	6.14

* Individually packaged

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎					○	○		○		○

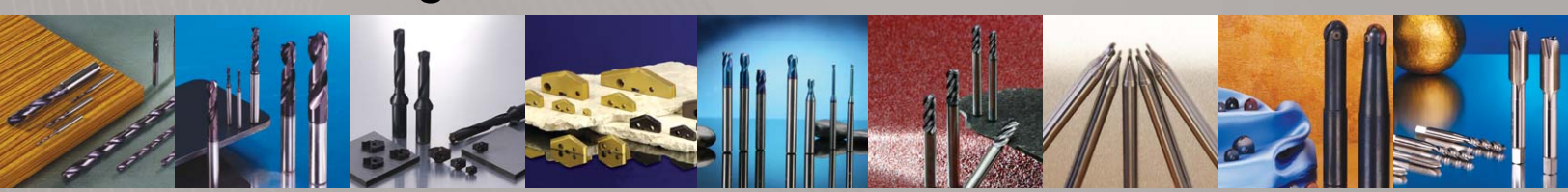
HSSCo8, NC-SPOTTING DRILLS

D2N90 SERIES

WORK MATERIAL	CARBON STEELS		ALLOY STEELS		ALLOY STEELS, TOOL STEELS, HARDENED STEELS		STAINLESS STEELS		ALUMINUM, ALUMINUM ALLOYS	
DIAMETER	N	S	N	S	N	S	N	S	N	S
1/8 ~5/32	2460	.002	2110	.002	1080	.002	940	.002	7040	.005
11/64 ~3/16	1850	.002	1580	.002	800	.002	700	.002	5280	.006
13/64 ~15/64	1510	.003	1300	.003	670	.003	580	.003	4400	.006
1/4 ~5/16	1170	.003	1030	.003	540	.003	460	.003	3520	.007
21/64 ~25/64	880	.004	790	.004	400	.004	350	.004	2640	.008
13/32 ~15/32	700	.004	630	.004	320	.004	290	.004	2110	.009
31/64 ~5/8	590	.005	530	.005	260	.005	240	.005	1760	.011
41/64 ~47/64	460	.007	400	.007	200	.007	180	.007	1320	.012
3/4 ~1	350	.009	320	.009	150	.009	140	.009	1060	.017

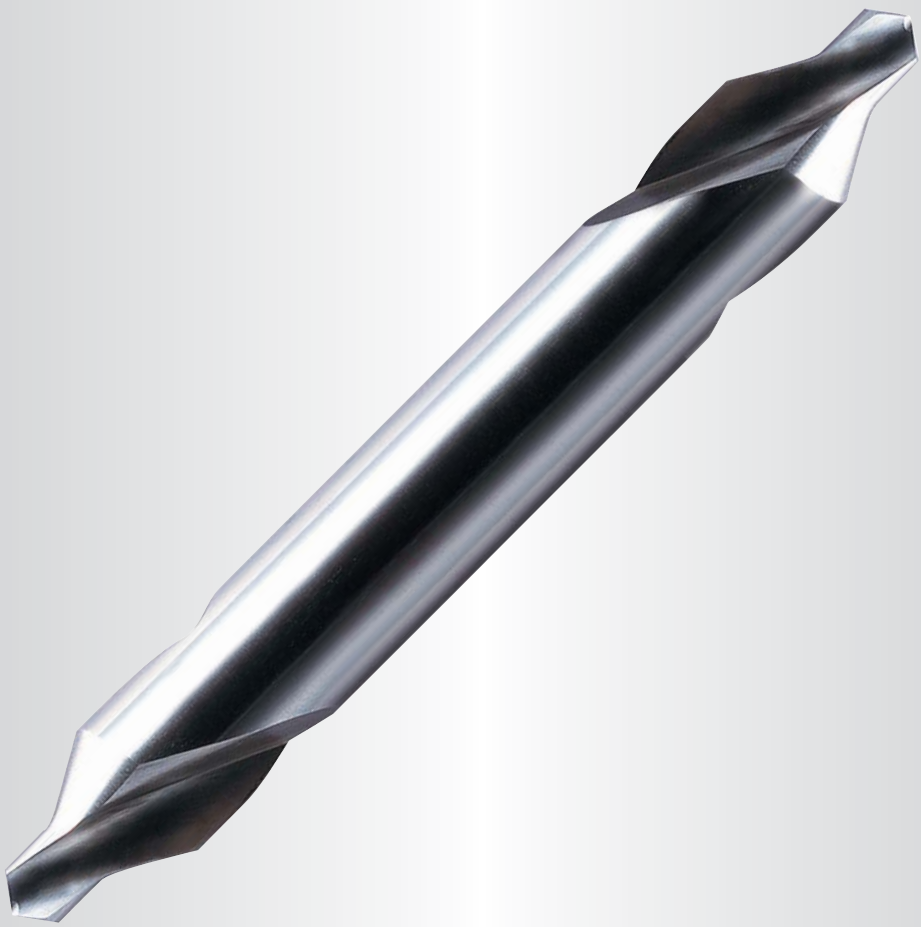
N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader YG-1



HSS

Being the best through innovation



COMBINATION DRILL & COUNTER SINK / CENTER DRIL

- Regular and Long Length

HSS COMBINATION DRILL & COUNTER SINK / CENTER DRILL

Regular and Long Length

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
INCH					
D1C90		HSS(M2), COMBINATION DRILL & COUNTER SINK / CENTER DRILL	D3/64	D7/32	194
		RECOMMENDED CUTTING CONDITIONS			

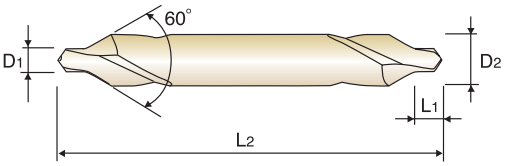
◎ : Excellent
○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○	○	○

COMBINATION DRILL & COUNTER SINK

D1C90 SERIES

HSS(M2), COMBINATION DRILL & COUNTER SINK / CENTER DRILL



HSS | h8 | k12 | 120°

60°

EDP No.	Size	Diameter D1	Shank Diameter D2	Drill Length L1	Overall Length L2
* D1C90079	1	3/64	1/8	1/16	1-1/2
* D1C90080	2	1/16	3/16	5/64	1-3/4
* D1C90081	3	3/32	1/4	1/8	2
* D1C90082	4	1/8	5/16	5/32	2-1/4
* D1C90083	5	3/6	7/16	1/4	2-1/2
★ D1C90084	6	7/32	1/2	7/32	3

* 10per package
★ Individually package

60°

EDP No.	Size	Diameter D1	Shank Diameter D2	Drill Length L1	Overall Length L2
* D1C90141	1	3/64	1/8	3/64	1-1/4
* D1C90142	2	5/64	3/16	5/64	1-7/8
* D1C90143	3	7/64	1/4	7/64	2
* D1C90144	4	1/8	5/16	1/8	2-1/8
* D1C90145	5	3/16	7/16	3/16	2-3/4

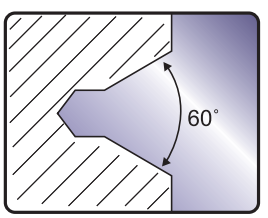
* 10per package

LONG LENGTH (60°)

Unit : Inch

EDP No.	Size	Diameter D1	Shank Diameter D2	Drill Length L1	Overall Length L2
* D1C90085	1	3/64	1/8	3/64	3
* D1C90086	1	3/64	1/8	3/64	4
* D1C90087	1	3/64	1/8	3/64	5
* D1C90088	1	3/64	1/8	3/64	6
* D1C90089	2	5/64	3/16	5/64	3
* D1C90090	2	5/64	3/16	5/64	4
* D1C90091	2	5/64	3/16	5/64	5
* D1C90092	2	5/64	3/16	5/64	6
* D1C90093	3	7/64	1/4	7/64	4
* D1C90094	3	7/64	1/4	7/64	5
* D1C90095	3	7/64	1/4	7/64	6
* D1C90096	4	1/8	5/16	1/8	4
* D1C90097	4	1/8	5/16	1/8	5
* D1C90098	4	1/8	5/16	1/8	6
* D1C90099	5	3/16	7/16	3/16	4
* D1C90100	5	3/16	7/16	3/16	5
* D1C90101	5	3/16	7/16	3/16	6
* D1C90102	6	7/32	1/2	7/32	4
* D1C90103	6	7/32	1/2	7/32	5
* D1C90104	6	7/32	1/2	7/32	6

* 10per package



◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		Cast Iron	Aluminum	Stainless Steels	Titanium	Mild Steels	Copper	Bronze
~HB225	HB225~325	HRc30~45	HRc45~55	HRc55~							
◎	◎				○	○	○	○	○	○	○

INSERTS & HOLDERS

Being the best through innovation

SPADE DRILLS

- **Carbide for Long Tool Life, and HSS-PM for General Machines and Large Diameters Higher Productivity than Other Drilling Tools**

SPADE DRILL INSERTS

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
SERIES 1~8		SPADE DRILL INSERTS - HSS M4	.7031 (#1)	4.5000 (#8)	198
SERIES Y,Z,0,1~8		SPADE DRILL INSERTS - SUPER HSS T15	.3740 (#Y)	4.5000 (#8)	202
SERIES Y,Z,0,1,2		SPADE DRILL INSERTS - PREMIUM HSS M48	.3740 (#Y)	1.3780 (#2)	209
SERIES Y,Z,0,1~3		CARBIDE BLADE INSERTS-C2(K20)	.3740 (#Y)	1.8750 (#3)	212
SERIES Y,Z,0,1~3		CARBIDE BLADE INSERTS-C5(P40)	.3740 (#Y)	1.8750 (#3)	212
SERIES Y,Z,0,1~2		CARBIDE BLADE INSERTS-C3(K10)	.3740 (#Y)	1.3780 (#2)	212
SERIES Y,Z,0,1~8		SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)	.3740 (#Y)	4.5000 (#8)	218
SERIES Y,Z,0,1~3		SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)	.3740 (#Y)	1.8750 (#3)	222
SERIES Y,Z,0,1,2		SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15	.3750 (#Y)	1.3750 (#2)	224

◎ : Excellent
○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎
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SPADE DRILLS

SERIES 1,2

SPADE DRILL INSERTS - HSS M4

- General purpose insert for most materials
- Not recommended for tool steels and high temp alloys
- High toughness for loose or manual machines

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
1 **.690 (17.53) to .960 (24.38)**	45/64	17.86	.7031	5/32 (4.0)	S01101	S03101	S04101
		18.00	.7087		S01102	S03102	S04102
	23/32	18.26	.7188		S01103	S03103	S04103
		18.50	.7283		S01104	S03104	S04104
	47/64	18.65	.7344		S01105	S03105	S04105
		19.00	.7480		S01106	S03106	S04106
	3/4	19.05	.7500		S01107	S03107	S04107
	49/64	19.45	.7656		S01108	S03108	S04108
		19.50	.7677		S01109	S03109	S04109
	25/32	19.84	.7813		S01110	S03110	S04110
		20.00	.7874		S01111	S03111	S04111
	51/64	20.24	.7969		S01160	S03160	S04160
		20.50	.8071		S01112	S03112	S04112
	13/16	20.64	.8125		S01113	S03113	S04113
		21.00	.8268		S01114	S03114	S04114
	27/32	21.43	.8438		S01115	S03115	S04115
	55/64	21.83	.8594		S01161	S03161	S04161
		22.00	.8661		S01116	S03116	S04116
	7/8	22.23	.8750		S01117	S03117	S04117
	57/64	22.62	.8906		S01162	S03162	S04162
		23.00	.9055		S01118	S03118	S04118
	29/32	23.02	.9063		S01119	S03119	S04119
	59/64	23.42	.9219		S01120	S03120	S04120
	15/16	23.81	.9375		S01121	S03121	S04121
		24.00	.9449		S01122	S03122	S04122
2 **.961 (24.41) to 1.380 (35.05)**	31/32	24.61	.9688	3/16 (4.8)	S01201	S03201	S04201
	63/64	25.00	.9843		S01202	S03202	S04202
	1	25.40	1.0000		S01203	S03203	S04203
	1-1/64	25.80	1.0156		S01204	S03204	S04204
		26.00	1.0236		S01205	S03205	S04205
	1-1/32	26.19	1.0313		S01206	S03206	S04206
	1-3/64	26.59	1.0469		S01260	S03260	S04260
	1-1/16	26.99	1.0625		S01207	S03207	S04207
		27.00	1.0630		S01208	S03208	S04208

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎

SPADE DRILL INSERTS - HSS M4

- ▶ General purpose insert for most materials
- ▶ Not recommended for tool steels and high temp alloys
- ▶ High toughness for loose or manual machines

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
					HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
2 **.961 (24.41) to 1.380 (35.05)**	1-3 / 32	27.78	1.0938	3 / 16 (4.8)	S01209	S03209	S04209
		28.00	1.1024		S01210	S03210	S04210
	1-7 / 64	28.18	1.1094		S01261	S03261	S04261
	1-1 / 8	28.58	1.1250		S01211	S03211	S04211
		29.00	1.1417		S01212	S03212	S04212
	1-5 / 32	29.37	1.1563		S01213	S03213	S04213
		30.00	1.1811		S01214	S03214	S04214
	1-3 / 16	30.16	1.1875		S01215	S03215	S04215
	1-7 / 32	30.96	1.2188		S01216	S03216	S04216
		31.00	1.2205		S01217	S03217	S04217
	1-1 / 4	31.75	1.2500		S01218	S03218	S04218
		32.00	1.2598		S01219	S03219	S04219
	1-9 / 32	32.54	1.2813		S01220	S03220	S04220
		33.00	1.2992		S01221	S03221	S04221
	1-5 / 16	33.34	1.3125		S01222	S03222	S04222
		34.00	1.3386		S01223	S03223	S04223
	1-11 / 32	34.13	1.3438		S01224	S03224	S04224
	1-3 / 8	34.93	1.3750		S01225	S03225	S04225
		35.00	1.3780		S01226	S03226	S04226
3 **1.353 (34.37) to 1.882 (47.80)**	1-13 / 32	35.72	1.4063	1 / 4 (6.4)	S01301	S03301	S04301
		36.00	1.4173		S01302	S03302	S04302
	1-7 / 16	36.51	1.4375		S01303	S03303	S04303
		37.00	1.4567		S01304	S03304	S04304
	1-15 / 32	37.31	1.4688		S01305	S03305	S04305
		38.00	1.4961		S01306	S03306	S04306
	1-1 / 2	38.10	1.5000		S01307	S03307	S04307
	1-17 / 32	38.89	1.5313		S01308	S03308	S04308
		39.00	1.5354		S01309	S03309	S04309
	1-9 / 16	39.69	1.5625		S01310	S03310	S04310
		40.00	1.5748		S01311	S03311	S04311
	1-19 / 32	40.48	1.5938		S01312	S03312	S04312
		41.00	1.6142		S01313	S03313	S04313
	1-5 / 8	41.28	1.6250		S01314	S03314	S04314
		42.00	1.6535		S01315	S03315	S04315

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎

SPADE DRILLS

SERIES 3,4

SPADE DRILL INSERTS - HSS M4

- ▶ General purpose insert for most materials
- ▶ Not recommended for tool steels and high temp alloys
- ▶ High toughness for loose or manual machines

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
3 **1.353 (34.37) to 1.882 (47.80)**	1-21 / 32	42.07	1.6563	1 / 4 (6.4)	S01316	S03316	S04316
	1-11 / 16	42.86	1.6875		S01317	S03317	S04317
		43.00	1.6929		S01318	S03318	S04318
	1-23 / 32	43.66	1.7188		S01319	S03319	S04319
		44.00	1.7323		S01320	S03320	S04320
	1-3 / 4	44.45	1.7500		S01321	S03321	S04321
		45.00	1.7717		S01322	S03322	S04322
	1-25 / 32	45.24	1.7813		S01323	S03323	S04323
		46.00	1.8110		S01324	S03324	S04324
	1-13 / 16	46.04	1.8125		S01325	S03325	S04325
	1-27 / 32	46.83	1.8438		S01326	S03326	S04326
		47.00	1.8504		S01327	S03327	S04327
	1-7 / 8	47.63	1.8750		S01328	S03328	S04328
4 **1.850 (46.99) to 2.570 (65.28)**	1-29 / 32	48.42	1.9063	5 / 16 (7.9)	S01402	S03402	S04402
	1-15 / 16	49.21	1.9375		S01404	S03404	S04404
	1-31 / 32	50.01	1.9688		S01406	S03406	S04406
	2	50.80	2.0000		S01407	S03407	S04407
	2-1 / 32	51.59	2.0313		S01409	S03409	S04409
	2-3 / 64	52.00	2.0472		S01410	S03410	S04410
	2-1 / 16	52.39	2.0625		S01411	S03411	S04411
	2-3 / 32	53.18	2.0938		S01413	S03413	S04413
	2-1 / 8	53.98	2.1250		S01414	S03414	S04414
	2-5 / 32	54.77	2.1563		S01416	S03416	S04416
	2-3 / 16	55.56	2.1875		S01418	S03418	S04418
	2-7 / 32	56.36	2.2188		S01420	S03420	S04420
	2-1 / 4	57.15	2.2500		S01422	S03422	S04422
	2-9 / 32	57.94	2.2813		S01423	S03423	S04423
	2-5 / 16	58.74	2.3125		S01425	S03425	S04425
	2-11 / 32	59.53	2.3438		S01427	S03427	S04427
	2-3 / 8	60.33	2.3750		S01429	S03429	S04429
	2-13 / 32	61.12	2.4063		S01431	S03431	S04431
	2-7 / 16	61.91	2.4375		S01432	S03432	S04432
	2-15 / 32	62.71	2.4688		S01434	S03434	S04434
	2-1 / 2	63.50	2.5000		S01436	S03436	S04436

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎

SPADE DRILL INSERTS - HSS M4

▶ General purpose insert for most materials
▶ Not recommended for tool steels and high temp alloys
▶ High toughness for loose or manual machines

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. HSS (M4)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
4	2-17 / 32	64.29	2.5313	5 / 16 (7.9)	S01438	S03438	S04438
	2-9 / 16	65.09	2.5625		S01440	S03440	S04440
5 **2.456 (62.38) to 3.000 (76.20)**	2-1 / 2	63.50	2.5000	7 / 16 (11.1)	S01501	S03501	S04501
	2-5 / 8	66.68	2.6250		S01507	S03507	S04507
	2-3 / 4	69.85	2.7500		S01512	S03512	S04512
	2-25 / 32	70.64	2.7813		S01514	S03514	S04514
	2-13 / 16	71.44	2.8125		S01515	S03515	S04515
	2-27 / 32	72.23	2.8438		S01517	S03517	S04517
	2-7 / 8	73.03	2.8750		S01518	S03518	S04518
	2-29 / 32	73.82	2.9063		S01519	S03519	S04519
	2-15 / 16	74.61	2.9375		S01521	S03521	S04521
	2-31 / 32	75.41	2.9688		S01522	S03522	S04522
	3	76.20	3.0000		S01524	S03524	S04524
6 **3.001(76.23) to 3.507(89.08)**	3-1 / 16	77.79	3.0625	7 / 16 (11.1)	S01602	S03602	S04602
	3-1 / 8	79.38	3.1250		S01605	S03605	S04605
	3-1 / 4	82.55	3.2500		S01611	S03611	S04611
	3-3 / 8	85.73	3.3750		S01616	S03616	S04616
	3-7 / 16	87.31	3.4375		S01619	S03619	S04619
	3-1 / 2	88.90	3.5000		S01622	S03622	S04622
7 **3.455 (87.76) to 4.000 (101.60)**	3-9 / 16	90.49	3.5625	7 / 16 (11.1)	S01703	S03703	S04703
	3-5 / 8	92.08	3.6250		S01706	S03706	S04706
	3-3 / 4	95.25	3.7500		S01711	S03711	S04711
	3-7 / 8	98.43	3.8750		S01717	S03717	S04717
	4	101.60	4.0000		S01722	S03722	S04722
8 **4.001 (101.63) to 4.507 (114.48)**	4-1 / 8	104.78	4.1250	7 / 16 (11.1)	S01804	S03804	S04804
	4-1 / 4	107.95	4.2500		S01807	S03807	S04807
	4-3 / 8	111.13	4.3750		S01811	S03811	S04811
	4-1 / 2	114.30	4.5000		S01815	S03815	S04815

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
○	○	○	○		○		○	○			◎	◎	○	◎	◎

SPADE DRILLS

SERIES Y,Z,0

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	SUPER COBALT(T15) TiN	SUPER COBALT(T15) TiAlN	SUPER COBALT(T15) Hardslick
Y .374 (9.50) to .436 (11.07)		9.50	.3740	3/32 (2.4)	* S06Y01	* S08Y01	* S09Y01
	3/8	9.53	.3750		* S06Y02	* S08Y02	* S09Y02
		9.80	.3860		* S06Y03	* S08Y03	* S09Y03
	25/64	9.92	.3906		* S06Y04	* S08Y04	* S09Y04
		10.00	.3937		* S06Y05	* S08Y05	* S09Y05
		10.20	.4016		* S06Y06	* S08Y06	* S09Y06
	13/32	10.32	.4063		* S06Y07	* S08Y07	* S09Y07
		10.50	.4134		* S06Y08	* S08Y08	* S09Y08
	27/64	10.72	.4219		* S06Y09	* S08Y09	* S09Y09
		10.80	.4252		* S06Y10	* S08Y10	* S09Y10
		11.00	.4331		* S06Y11	* S08Y11	* S09Y11
Z .437 (11.11) to .510 (12.95)	7/16	11.11	.4375	3/32 (2.4)	* S06Z01	* S08Z01	* S09Z01
		11.50	.4528		* S06Z02	* S08Z02	* S09Z02
	29/64	11.51	.4531		* S06Z03	* S08Z03	* S09Z03
	15/32	11.91	.4688		* S06Z04	* S08Z04	* S09Z04
		12.00	.4724		* S06Z05	* S08Z05	* S09Z05
	31/64	12.30	.4844		* S06Z06	* S08Z06	* S09Z06
		12.50	.4921		* S06Z07	* S08Z07	* S09Z07
	1/2	12.70	.5000		* S06Z08	* S08Z08	* S09Z08
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	* S06001	* S08001	* S09001
	33/64	13.10	.5156		* S06002	* S08002	* S09002
	17/32	13.49	.5313		* S06003	* S08003	* S09003
		13.50	.5315		* S06004	* S08004	* S09004
	35/64	13.89	.5469		* S06060	* S08060	* S09060
		14.00	.5512		* S06005	* S08005	* S09005
	9/16	14.29	.5625		* S06006	* S08006	* S09006
		14.50	.5709		* S06007	* S08007	* S09007
	37/64	14.68	.5781		* S06008	* S08008	* S09008
		15.00	.5906		* S06009	* S08009	* S09009
	19/32	15.08	.5938		* S06010	* S08010	* S09010
	39/64	15.48	.6094		* S06061	* S08061	* S09061
		15.50	.6102		* S06011	* S08011	* S09011
	5/8	15.88	.6250		* S06012	* S08012	* S09012

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	SUPER COBALT(T15) TiN	TiAlN	Hardslick
0 **.511 (12.98) to .695 (17.65)**		16.00	.6299	1/8 (3.2)	* S06013	* S08013	* S09013
	41/64	16.27	.6406		* S06062	* S08062	* S09062
		16.50	.6496		* S06014	* S08014	* S09014
	21/32	16.67	.6563		* S06015	* S08015	* S09015
		17.00	.6693		* S06016	* S08016	* S09016
	43/64	17.07	.6719		* S06063	* S08063	* S09063
	11/16	17.46	.6875		* S06017	* S08017	* S09017
		17.50	.6890		* S06018	* S08018	* S09018
1 **.690 (17.53) to .960 (24.38)**	45/64	17.86	.7031	5/32 (4.0)	S06101	S08101	S09101
		18.00	.7087		S06102	S08102	S09102
	23/32	18.26	.7188		S06103	S08103	S09103
		18.50	.7283		S06104	S08104	S09104
	47/64	18.65	.7344		S06105	S08105	S09105
		19.00	.7480		S06106	S08106	S09106
	3/4	19.05	.7500		S06107	S08107	S09107
	49/64	19.45	.7656		S06108	S08108	S09108
		19.50	.7677		S06109	S08109	S09109
	25/32	19.84	.7813		S06110	S08110	S09110
		20.00	.7874		S06111	S08111	S09111
	51/64	20.24	.7969		S06160	S08160	S09160
		20.50	.8071		S06112	S08112	S09112
	13/16	20.64	.8125		S06113	S08113	S09113
		21.00	.8268		S06114	S08114	S09114
	27/32	21.43	.8438		S06115	S08115	S09115
	55/64	21.83	.8594		S06161	S08161	S09161
		22.00	.8661		S06116	S08116	S09116
	7/8	22.23	.8750		S06117	S08117	S09117
	57/64	22.62	.8906		S06162	S08162	S09162
		23.00	.9055		S06118	S08118	S09118
	29/32	23.02	.9063		S06119	S08119	S09119
	59/64	23.42	.9219		S06120	S08120	S09120
	15/16	23.81	.9375		S06121	S08121	S09121
		24.00	.9449		S06122	S08122	S09122

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 2,3

SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	SUPER COBALT(T15) TiN	SUPER COBALT(T15) TiAlN	SUPER COBALT(T15) Hardslick
2 **.961 (24.41) to 1.380 (35.05)**	31 / 32	24.61	.9688	3 / 16 (4.8)	S06201	S08201	S09201
	63 / 64	25.00	.9843		S06202	S08202	S09202
	1	25.40	1.0000		S06203	S08203	S09203
	1-1 / 64	25.80	1.0156		S06204	S08204	S09204
		26.00	1.0236		S06205	S08205	S09205
	1-1 / 32	26.19	1.0313		S06206	S08206	S09206
	1-3 / 64	26.59	1.0469		S06260	S08260	S09260
	1-1 / 16	26.99	1.0625		S06207	S08207	S09207
		27.00	1.0630		S06208	S08208	S09208
	1-3 / 32	27.78	1.0938		S06209	S08209	S09209
		28.00	1.1024		S06210	S08210	S09210
	1-7 / 64	28.18	1.1094		S06261	S08261	S09261
	1-1 / 8	28.58	1.1250		S06211	S08211	S09211
		29.00	1.1417		S06212	S08212	S09212
	1-5 / 32	29.37	1.1563		S06213	S08213	S09213
		30.00	1.1811		S06214	S08214	S09214
	1-3 / 16	30.16	1.1875		S06215	S08215	S09215
	1-7 / 32	30.96	1.2188		S06216	S08216	S09216
		31.00	1.2205		S06217	S08217	S09217
	1-1 / 4	31.75	1.2500		S06218	S08218	S09218
		32.00	1.2598		S06219	S08219	S09219
	1-9 / 32	32.54	1.2813		S06220	S08220	S09220
		33.00	1.2992		S06221	S08221	S09221
	1-5 / 16	33.34	1.3125		S06222	S08222	S09222
		34.00	1.3386		S06223	S08223	S09223
	1-11 / 32	34.13	1.3438		S06224	S08224	S09224
	1-3 / 8	34.93	1.3750		S06225	S08225	S09225
		35.00	1.3780		S06226	S08226	S09226
3	1-13 / 32	35.72	1.4063	1 / 4 (6.4)	S06301	S08301	S09301
		36.00	1.4173		S06302	S08302	S09302
	1-7 / 16	36.51	1.4375		S06303	S08303	S09303
		37.00	1.4567		S06304	S08304	S09304
	1-15 / 32	37.31	1.4688		S06305	S08305	S09305

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	SUPER COBALT(T15) TiN	TiAlN	Hardslick
3 **1.353 (34.37) to 1.882 (47.80)**		38.00	1.4961	1/4 (6.4)	S06306	S08306	S09306
	1-1/2	38.10	1.5000		S06307	S08307	S09307
	1-17/32	38.89	1.5313		S06308	S08308	S09308
		39.00	1.5354		S06309	S08309	S09309
	1-9/16	39.69	1.5625		S06310	S08310	S09310
		40.00	1.5748		S06311	S08311	S09311
	1-19/32	40.48	1.5938		S06312	S08312	S09312
		41.00	1.6142		S06313	S08313	S09313
	1-5/8	41.28	1.6250		S06314	S08314	S09314
		42.00	1.6535		S06315	S08315	S09315
	1-21/32	42.07	1.6563		S06316	S08316	S09316
	1-11/16	42.86	1.6875		S06317	S08317	S09317
		43.00	1.6929		S06318	S08318	S09318
	1-23/32	43.66	1.7188		S06319	S08319	S09319
		44.00	1.7323		S06320	S08320	S09320
	1-3/4	44.45	1.7500		S06321	S08321	S09321
		45.00	1.7717		S06322	S08322	S09322
	1-25/32	45.24	1.7813		S06323	S08323	S09323
		46.00	1.8110		S06324	S08324	S09324
	1-13/16	46.04	1.8125		S06325	S08325	S09325
	1-27/32	46.83	1.8438		S06326	S08326	S09326
		47.00	1.8504		S06327	S08327	S09327
	1-7/8	47.63	1.8750		S06328	S08328	S09328
4 **1.850 (46.99) to 2.570 (65.28)**	1-29/32	48.42	1.9062	5/16 (7.9)	S06402	S08402	S09402
	1-15/16	49.21	1.9375		S06404	S08404	S09404
	1-31/32	50.01	1.9688		S06406	S08406	S09406
	2	50.80	2.0000		S06407	S08407	S09407
	2-1/32	51.59	2.0312		S06409	S08409	S09409
	2-3/64	52.00	2.0472		S06410	S08410	S09410
	2-1/16	52.39	2.0625		S06411	S08411	S09411
	2-3/32	53.18	2.0938		S06413	S08413	S09413
	2-1/8	53.98	2.1250		S06414	S08414	S09414
	2-5/32	54.77	2.1562		S06416	S08416	S09416

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 4,5

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	SUPER COBALT(T15) TiN	SUPER COBALT(T15) TiAlN	SUPER COBALT(T15) Hardslick
4 **1.850 (46.99) to 2.570 (65.28)**	2-3/16	55.56	2.1875	5/16 (7.9)	S06418	S08418	S09418
	2-7/32	56.36	2.2188		S06420	S08420	S09420
	2-1/4	57.15	2.2500		S06422	S08422	S09422
	2-9/32	57.94	2.2812		S06423	S08423	S09423
	2-5/16	58.74	2.3125		S06425	S08425	S09425
	2-11/32	59.53	2.3438		S06427	S08427	S09427
	2-3/8	60.33	2.3750		S06429	S08429	S09429
	2-13/32	61.12	2.4062		S06431	S08431	S09431
	2-7/16	61.91	2.4375		S06432	S08432	S09432
	2-15/32	62.71	2.4688		S06434	S08434	S09434
	2-1/2	63.50	2.5000		S06436	S08436	S09436
	2-17/32	64.29	2.5312		S06438	S08438	S09438
	2-9/16	65.09	2.5625		S06440	S08440	S09440
5 **2.456 (62.38) to 3.000 (76.20)**	2-1/2	63.50	2.5000	7/16 (11.1)	—	—	S09501
		64.00	2.5197		—	—	S09502
	2-17/32	64.29	2.5312		—	—	S09503
	2-9/16	65.09	2.5625		—	—	S09504
	2-19/32	65.88	2.5938		—	—	S09505
		66.00	2.5984		—	—	S09506
	2-5/8	66.68	2.6250		—	—	S09507
	2-21/32	67.47	2.6562		—	—	S09508
		68.00	2.6772		—	—	S09509
	2-11/16	68.26	2.6875		—	—	S09510
	2-23/32	69.09	2.7188		—	—	S09511
	2-3/4	69.85	2.7500		—	—	S09512
		70.00	2.7559		—	—	S09513
	2-25/32	70.64	2.7812		—	—	S09514
	2-13/16	71.44	2.8125		—	—	S09515
		72.00	2.8346		—	—	S09516
	2-27/32	72.23	2.8438		—	—	S09517
	2-7/8	73.03	2.8750		—	—	S09518
	2-29/32	73.82	2.9062		—	—	S09519
		74.00	2.9134		—	—	S09520

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
5	2-15 / 16	74.61	2.9375	7 / 16 (11.1)	—	—	S09521
	2-31 / 32	75.41	2.8688		—	—	S09522
		76.00	2.9921		—	—	S09523
	3	76.20	3.0000		—	—	S09524
6 **3.001 (76.23) to 3.507 (89.08)**	3-1 / 32	76.99	3.0312	7 / 16 (11.1)	—	—	S09601
	3-1 / 16	77.79	3.0625		—	—	S09602
		78.00	3.0709		—	—	S09603
	3-3 / 32	78.58	3.0938		—	—	S09604
	3-1 / 8	79.38	3.1250		—	—	S09605
		80.00	3.1496		—	—	S09606
	3-5 / 32	80.17	3.1562		—	—	S09607
	3-3 / 16	80.96	3.1875		—	—	S09608
	3-7 / 32	81.76	3.2188		—	—	S09609
		82.00	3.2283		—	—	S09610
	3-1 / 4	82.55	3.2500		—	—	S09611
	3-9 / 32	83.34	3.2812		—	—	S09612
		84.00	3.3071		—	—	S09613
	3-5 / 16	84.14	3.3125		—	—	S09614
	3-11 / 32	84.93	3.3438		—	—	S09615
	3-3 / 8	85.73	3.3750		—	—	S09616
		86.00	3.3858		—	—	S09617
	3-13 / 32	86.52	3.3062		—	—	S09618
	3-7 / 16	87.31	3.4375		—	—	S09619
		88.00	3.4646		—	—	S09620
	3-15 / 32	88.11	3.4688		—	—	S09621
	3-1 / 2	88.90	3.5000		—	—	S09622
7 **3.455(87.76) to 4.000(101.60)**	3-17 / 32	89.69	3.5312	7 / 16 (11.1)	—	—	S09701
		90.00	3.5433		—	—	S09702
	3-9 / 16	90.49	3.5625		—	—	S09703
	3-19 / 32	91.28	3.5938		—	—	S09704
		92.00	3.6221		—	—	S09705
	3-5 / 8	92.08	3.6250		—	—	S09706
	3-21 / 32	92.87	3.6563		—	—	S09707

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 7,8

SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Increase wear resistance over M4
- ▶ For use in medium carbon steel to high temperature alloys over 280 Brinell
- ▶ Performs best in rigid setups

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. SUPER COBALT(T15)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
7 **3.455 (87.76) to 4.000 (101.60)**	3-11/16	93.66	3.6875	7/16 (11.1)	—	—	S09708
		94.00	3.7008		—	—	S09709
	3-23/32	94.46	3.7188		—	—	S09710
	3-3/4	95.25	3.7500		—	—	S09711
		96.00	3.7795		—	—	S09712
	3-25/32	96.04	3.7812		—	—	S09713
	3-13/16	96.84	3.8125		—	—	S09714
	3-27/32	97.63	3.8438		—	—	S09715
		98.00	3.8583		—	—	S09716
	3-7/8	98.43	3.8750		—	—	S09717
	3-29/32	99.22	3.9062		—	—	S09718
		100.00	3.9370		—	—	S09719
	3-15/16	100.01	3.9375		—	—	S09720
	3-31/32	100.81	3.9688		—	—	S09721
	4	101.60	4.0000		—	—	S09722
8 **4.001 (101.63) to 4.507 (114.48)**	4-1/64	102.00	4.0156	7/16 (11.1)	—	—	S09801
	4-1/16	103.19	4.0625		—	—	S09802
	4-3/32	104.00	4.0945		—	—	S09803
	4-1/8	104.78	4.1250		—	—	S09804
		106.00	4.1732		—	—	S09805
	4-3/16	106.36	4.1875		—	—	S09806
	4-1/4	107.95	4.2500		—	—	S09807
		108.00	4.2520		—	—	S09808
	4-5/16	109.54	4.3125		—	—	S09809
		110.00	4.3307		—	—	S09810
	4-3/8	111.13	4.3750		—	—	S09811
		112.00	4.4094		—	—	S09812
	4-7/16	112.71	4.4375		—	—	S09813
		114.00	4.4882		—	—	S09814
	4-1/2	114.30	4.5000		—	—	S09815

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	PREMIUM COBALT(M48) TiN	TiAlN	Hardslick
Y **.374 (9.50) to .436 (11.07)**		9.50	.3740	3/32 (2.4)	* S11Y01	* S13Y01	* S14Y01
	3/8	9.53	.3750		* S11Y02	* S13Y02	* S14Y02
		9.80	.3860		* S11Y03	* S13Y03	* S14Y03
	25/64	9.92	.3906		* S11Y04	* S13Y04	* S14Y04
		10.00	.3937		* S11Y05	* S13Y05	* S14Y05
		10.20	.4016		* S11Y06	* S13Y06	* S14Y06
	13/32	10.32	.4063		* S11Y07	* S13Y07	* S14Y07
		10.50	.4134		* S11Y08	* S13Y08	* S14Y08
	27/64	10.72	.4219		* S11Y09	* S13Y09	* S14Y09
		10.80	.4252		* S11Y10	* S13Y10	* S14Y10
		11.00	.4331		* S11Y11	* S13Y11	* S14Y11
Z **.437 (11.11) to .510 (12.95)**	7/16	11.11	.4375	3/32 (2.4)	* S11Z01	* S13Z01	* S14Z01
		11.50	.4528		* S11Z02	* S13Z02	* S14Z02
	29/64	11.51	.4531		* S11Z03	* S13Z03	* S14Z03
	15/32	11.91	.4688		* S11Z04	* S13Z04	* S14Z04
		12.00	.4724		* S11Z05	* S13Z05	* S14Z05
	31/64	12.30	.4844		* S11Z06	* S13Z06	* S14Z06
		12.50	.4921		* S11Z07	* S13Z07	* S14Z07
	1/2	12.70	.5000		* S11Z08	* S13Z08	* S14Z08
0 **.511 (12.98) to .695 (17.65)**		13.00	.5118	1/8 (3.2)	* S11001	* S13001	* S14001
	33/64		.5156		* S11002	* S13002	* S14002
	17/32		.5313		* S11003	* S13003	* S14003
		13.50	.5315		* S11004	* S13004	* S14004
	35/64		.5469		* S11060	* S13060	* S14060
		14.00	.5512		* S11005	* S13005	* S14005
	9/16		.5625		* S11006	* S13006	* S14006
		14.50	.5709		* S11007	* S13007	* S14007
	37/64		.5781		* S11008	* S13008	* S14008
		15.00	.5906		* S11009	* S13009	* S14009
	19/32		.5938		* S11010	* S13010	* S14010
	39/64		.6094		* S11061	* S13061	* S14061
		15.50	.6102		* S11011	* S13011	* S14011
	5/8		.6250		* S11012	* S13012	* S14012

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

SPADE DRILLS

SERIES 0,1

SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No. PREMIUM COBALT(M48)		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	Hardslick
0 **.511 (12.98) to .695 (17.65)**		16.00	.6299	1/8 (3.2)	* S11013	* S13013	* S14013
	41/64		.6406		* S11062	* S13062	* S14062
		16.50	.6496		* S11014	* S13014	* S14014
	21/32		.6563		* S11015	* S13015	* S14015
		17.00	.6693		* S11016	* S13016	* S14016
	43/64		.6719		* S11063	* S13063	* S14063
	11/16		.6875		* S11017	* S13017	* S14017
		17.50	.6890		* S11018	* S13018	* S14018
1 **.690 (17.53) to .960 (24.38)**	45/64	17.86	.7031	5/32 (4.0)	S11101	S13101	S14101
		18.00	.7087		S11102	S13102	S14102
	23/32	18.26	.7188		S11103	S13103	S14103
		18.50	.7283		S11104	S13104	S14104
	47/64	18.65	.7344		S11105	S13105	S14105
		19.00	.7480		S11106	S13106	S14106
	3/4	19.05	.7500		S11107	S13107	S14107
	49/64	19.45	.7656		S11108	S13108	S14108
		19.50	.7677		S11109	S13109	S14109
	25/32	19.84	.7812		S11110	S13110	S14110
		20.00	.7874		S11111	S13111	S14111
	51/64	20.24	.7969		S11160	S13160	S14160
		20.50	.8071		S11112	S13112	S14112
	13/16	20.64	.8125		S11113	S13113	S14113
		21.00	.8268		S11114	S13114	S14114
	27/32	21.43	.8438		S11115	S13115	S14115
	55/64	21.83	.8594		S11161	S13161	S14161
		22.00	.8661		S11116	S13116	S14116
	7/8	22.23	.8750		S11117	S13117	S14117
	57/64	22.62	.8906		S11162	S13162	S14162
		23.00	.9055		S11118	S13118	S14118
	29/32	23.02	.9062		S11119	S13119	S14119
	59/64	23.42	.9219		S11120	S13120	S14120
	15/16	23.81	.9375		S11121	S13121	S14121
		24.00	.9449		S11122	S13122	S14122

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- ▶ Increased tool life over T15
- ▶ For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- ▶ Rigid set up needed

POINT ANGLE : 132 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.		
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	PREMIUM COBALT(M48) TiN	TiAlN	Hardslick
2 **.961 (24.41) to 1.380 (35.05)**	31 / 32	24.61	.9688		S11201	S13201	S14201
	63 / 64	25.00	.9843		S11202	S13202	S14202
	1	25.40	1.0000		S11203	S13203	S14203
	1-1 / 64	25.80	1.0156		S11204	S13204	S14204
		26.00	1.0236		S11205	S13205	S14205
	1-1 / 32	26.19	1.0312		S11206	S13206	S14206
	1-3 / 64	26.59	1.0469		S11260	S13260	S14260
	1-1 / 16	26.99	1.0625		S11207	S13207	S14207
		27.00	1.0630		S11208	S13208	S14208
	1-3 / 32	27.78	1.0938		S11209	S13209	S14209
		28.00	1.1024		S11210	S13210	S14210
	1-7 / 64	28.18	1.1094		S11261	S13261	S14261
	1-1 / 8	28.58	1.1250		S11211	S13211	S14211
		29.00	1.1417	3 / 16	S11212	S13212	S14212
	1-5 / 32	29.37	1.1562	(4.8)	S11213	S13213	S14213
		30.00	1.1811		S11214	S13214	S14214
	1-3 / 16	30.16	1.1875		S11215	S13215	S14215
	1-7 / 32	30.96	1.2188		S11216	S13216	S14216
		31.00	1.2205		S11217	S13217	S14217
	1-1 / 4	31.75	1.2500		S11218	S13218	S14218
		32.00	1.2598		S11219	S13219	S14219
	1-9 / 32	32.54	1.2812		S11220	S13220	S14220
		33.00	1.2992		S11221	S13221	S14221
	1-5 / 16	33.34	1.3125		S11222	S13222	S14222
		34.00	1.3386		S11223	S13223	S14223
	1-11 / 32	34.13	1.3438		S11224	S13224	S14224
	1-3 / 8	34.93	1.3750		S11225	S13225	S14225
		35.00	1.3780		S11226	S13226	S14226

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	○	○

SPADE DRILLS

SERIES Y,Z

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
Y **.374 (9.50) to .436 (11.07)**		9.50	.3740	3/32 (2.4)	* S21Y01	* S23Y01	* S26Y01	* S28Y01	* S16Y01	* S18Y01
	3/8	9.53	.3750		* S21Y02	* S23Y02	* S26Y02	* S28Y02	* S16Y02	* S18Y02
		9.80	.3860		* S21Y03	* S23Y03	* S26Y03	* S28Y03	* S16Y03	* S18Y03
	25/64	9.92	.3906		* S21Y04	* S23Y04	* S26Y04	* S28Y04	* S16Y04	* S18Y04
		10.00	.3937		* S21Y05	* S23Y05	* S26Y05	* S28Y05	* S16Y05	* S18Y05
		10.20	.4016		* S21Y06	* S23Y06	* S26Y06	* S28Y06	* S16Y06	* S18Y06
	13/32	10.32	.4063		* S21Y07	* S23Y07	* S26Y07	* S28Y07	* S16Y07	* S18Y07
		10.50	.4134		* S21Y08	* S23Y08	* S26Y08	* S28Y08	* S16Y08	* S18Y08
	27/64	10.72	.4219		* S21Y09	* S23Y09	* S26Y09	* S28Y09	* S16Y09	* S18Y09
		10.80	.4252		* S21Y10	* S23Y10	* S26Y10	* S28Y10	* S16Y10	* S18Y10
		11.00	.4331		* S21Y11	* S23Y11	* S26Y11	* S28Y11	* S16Y11	* S18Y11
Z **.437 (11.11) to .510 (12.95)**	7/16	11.11	.4375	3/32 (2.4)	* S21Z01	* S23Z01	* S26Z01	* S28Z01	* S16Z01	* S18Z01
		11.50	.4528		* S21Z02	* S23Z02	* S26Z02	* S28Z02	* S16Z02	* S18Z02
	29/64	11.51	.4531		* S21Z03	* S23Z03	* S26Z03	* S28Z03	* S16Z03	* S18Z03
	15/32	11.91	.4688		* S21Z04	* S23Z04	* S26Z04	* S28Z04	* S16Z04	* S18Z04
		12.00	.4724		* S21Z05	* S23Z05	* S26Z05	* S28Z05	* S16Z05	* S18Z05
	31/64	12.30	.4844		* S21Z06	* S23Z06	* S26Z06	* S28Z06	* S16Z06	* S18Z06
		12.50	.4921		* S21Z07	* S23Z07	* S26Z07	* S28Z07	* S16Z07	* S18Z07
	1/2	12.70	.5000		* S21Z08	* S23Z08	* S26Z08	* S28Z08	* S16Z08	* S18Z08

* 2pcs per package

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

SPADE DRILLS

SERIES 0

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
0 .511 (12.98) to .695 (17.65)		13.00	.5118	1/8 (3.2)	*S21001	*S23001	*S26001	*S28001	*S16001	*S18001
	33/64	13.10	.5156		*S21002	*S23002	*S26002	*S28002	*S16002	*S18002
	17/32	13.49	.5313		*S21003	*S23003	*S26003	*S28003	*S16003	*S18003
		13.50	.5315		*S21004	*S23004	*S26004	*S28004	*S16004	*S18004
	35/64	13.89	.5469		*S21060	*S23060	*S26060	*S28060	*S16060	*S18060
		14.00	.5512		*S21005	*S23005	*S26005	*S28005	*S16005	*S18005
	9/16	14.29	.5625		*S21006	*S23006	*S26006	*S28006	*S16006	*S18006
		14.50	.5709		*S21007	*S23007	*S26007	*S28007	*S16007	*S18007
	37/64	14.68	.5781		*S21008	*S23008	*S26008	*S28008	*S16008	*S18008
		15.00	.5906		*S21009	*S23009	*S26009	*S28009	*S16009	*S18009
	19/32	15.08	.5938		*S21010	*S23010	*S26010	*S28010	*S16010	*S18010
	39/64	15.48	.6094		*S21061	*S23061	*S26061	*S28061	*S16061	*S18061
		15.50	.6102		*S21011	*S23011	*S26011	*S28011	*S16011	*S18011
		15.70	.6181		*S21064	*S23064	*S26064	*S28064	*S16064	*S18064
	5/8	15.88	.6250		*S21012	*S23012	*S26012	*S28012	*S16012	*S18012
		16.00	.6299		*S21013	*S23013	*S26013	*S28013	*S16013	*S18013
	41/64	16.27	.6406		*S21062	*S23062	*S26062	*S28062	*S16062	*S18062
		16.50	.6496		*S21014	*S23014	*S26014	*S28014	*S16014	*S18014
	21/32	16.67	.6563		*S21015	*S23015	*S26015	*S28015	*S16015	*S18015
		17.00	.6693		*S21016	*S23016	*S26016	*S28016	*S16016	*S18016
	43/64	17.07	.6719		*S21063	*S23063	*S26063	*S28063	*S16063	*S18063
	11/16	17.46	.6875		*S21017	*S23017	*S26017	*S28017	*S16017	*S18017
		17.50	.6890		*S21018	*S23018	*S26018	*S28018	*S16018	*S18018

* 2pcs per package

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

SPADE DRILLS

SERIES 1

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
1 .690 (17.53) to .960 (24.38)	45/64	17.86	.7031	5/32 (4.0)	S21101	S23101	S26101	S28101	S16101	S18101
		18.00	.7087		S21102	S23102	S26102	S28102	S16102	S18102
	23/32	18.26	.7188		S21103	S23103	S26103	S28103	S16103	S18103
		18.50	.7283		S21104	S23104	S26104	S28104	S16104	S18104
	47/64	18.65	.7344		S21105	S23105	S26105	S28105	S16105	S18105
		19.00	.7480		S21106	S23106	S26106	S28106	S16106	S18106
	3/4	19.05	.7500		S21107	S23107	S26107	S28107	S16107	S18107
	49/64	19.45	.7656		S21108	S23108	S26108	S28108	S16108	S18108
		19.50	.7677		S21109	S23109	S26109	S28109	S16109	S18109
	25/32	19.84	.7813		S21110	S23110	S26110	S28110	S16110	S18110
		20.00	.7874		S21111	S23111	S26111	S28111	S16111	S18111
	51/64	20.24	.7969		S21160	S23160	S26160	S28160	S16160	S18160
		20.50	.8071		S21112	S23112	S26112	S28112	S16112	S18112
	13/16	20.64	.8125		S21113	S23113	S26113	S28113	S16113	S18113
		21.00	.8268		S21114	S23114	S26114	S28114	S16114	S18114
	27/32	21.43	.8438		S21115	S23115	S26115	S28115	S16115	S18115
	55/64	21.83	.8594		S21161	S23161	S26161	S28161	S16161	S18161
		22.00	.8661		S21116	S23116	S26116	S28116	S16116	S18116
	7/8	22.23	.8750		S21117	S23117	S26117	S28117	S16117	S18117
	57/64	22.62	.8906		S21162	S23162	S26162	S28162	S16162	S18162
		23.00	.9055		S21118	S23118	S26118	S28118	S16118	S18118
	29/32	23.02	.9063		S21119	S23119	S26119	S28119	S16119	S18119
	59/64	23.42	.9219		S21120	S23120	S26120	S28120	S16120	S18120
	15/16	23.81	.9375		S21121	S23121	S26121	S28121	S16121	S18121
		24.00	.9449		S21122	S23122	S26122	S28122	S16122	S18122

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

SPADE DRILLS

SERIES 2

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
2 .961 (24.41) to 1.380 (35.05)	31 / 32	24.61	.9688	3 / 16 (4.8)	S21201	S23201	S26201	S28201	S16201	S18201
	63 / 64	25.00	.9843		S21202	S23202	S26202	S28202	S16202	S18202
	1	25.40	1.0000		S21203	S23203	S26203	S28203	S16203	S18203
	1-1 / 64	25.80	1.0156		S21204	S23204	S26204	S28204	S16204	S18204
		26.00	1.0236		S21205	S23205	S26205	S28205	S16205	S18205
	1-1 / 32	26.19	1.0313		S21206	S23206	S26206	S28206	S16206	S18206
	1-3 / 64	26.59	1.0469		S21260	S23260	S26260	S28260	S16260	S18260
	1-1 / 16	26.99	1.0625		S21207	S23207	S26207	S28207	S16207	S18207
		27.00	1.0630		S21208	S23208	S26208	S28208	S16208	S18208
	1-3 / 32	27.78	1.0938		S21209	S23209	S26209	S28209	S16209	S18209
		28.00	1.1024		S21210	S23210	S26210	S28210	S16210	S18210
	1-7 / 64	28.18	1.1094		S21261	S23261	S26261	S28261	S16261	S18261
	1-1 / 8	28.58	1.1250		S21211	S23211	S26211	S28211	S16211	S18211
		29.00	1.1417		S21212	S23212	S26212	S28212	S16212	S18212
	1-5 / 32	29.37	1.1563		S21213	S23213	S26213	S28213	S16213	S18213
		30.00	1.1811		S21214	S23214	S26214	S28214	S16214	S18214
	1-3 / 16	30.16	1.1875		S21215	S23215	S26215	S28215	S16215	S18215
	1-7 / 32	30.96	1.2188		S21216	S23216	S26216	S28216	S16216	S18216
		31.00	1.2205		S21217	S23217	S26217	S28217	S16217	S18217
	1-1 / 4	31.75	1.2500		S21218	S23218	S26218	S28218	S16218	S18218
		32.00	1.2598		S21219	S23219	S26219	S28219	S16219	S18219
	1-9 / 32	32.54	1.2813		S21220	S23220	S26220	S28220	S16220	S18220
		33.00	1.2992		S21221	S23221	S26221	S28221	S16221	S18221
	1-5 / 16	33.34	1.3125		S21222	S23222	S26222	S28222	S16222	S18222
		34.00	1.3386		S21223	S23223	S26223	S28223	S16223	S18223
	1-11 / 32	34.13	1.3438		S21224	S23224	S26224	S28224	S16224	S18224
	1-3 / 8	34.93	1.3750		S21225	S23225	S26225	S28225	S16225	S18225
		35.00	1.3780		S21226	S23226	S26226	S28226	S16226	S18226

◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

SPADE DRILLS

SERIES 3

CARBIDE BLADE INSERTS(C2,C5,C3)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- ▶ For general use in carbon steels and alloys steels. (C5)
- ▶ For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			Thick	EDP No.					
					Multi purpose Geometry				Cast Iron Geometry	
					C2(K20)		C5(P40)		C3(K10)	
	Fractional (inch)	Metric (mm)	Decimal (inch)	Metric (inch/mm)	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
3 1.353 (34.37) to 1.882 (47.80)	1-13/32	35.72	1.4063	1/4 (6.4)	S21301	S23301	S26301	S28301	Special or non-standard inserts available on request	
		36.00	1.4173		S21302	S23302	S26302	S28302		
	1-7/16	36.51	1.4375		S21303	S23303	S26303	S28303		
		37.00	1.4567		S21304	S23304	S26304	S28304		
	1-15/32	37.31	1.4688		S21305	S23305	S26305	S28305		
		38.00	1.4961		S21306	S23306	S26306	S28306		
	1-1/2	38.10	1.5000		S21307	S23307	S26307	S28307		
	1-17/32	38.89	1.5313		S21308	S23308	S26308	S28308		
		39.00	1.5354		S21309	S23309	S26309	S28309		
	1-9/16	39.69	1.5625		S21310	S23310	S26310	S28310		
		40.00	1.5748		S21311	S23311	S26311	S28311		
	1-19/32	40.48	1.5938		S21312	S23312	S26312	S28312		
		41.00	1.6142		S21313	S23313	S26313	S28313		
	1-5/8	41.28	1.6250		S21314	S23314	S26314	S28314		
		42.00	1.6535		S21315	S23315	S26315	S28315		
	1-21/32	42.07	1.6563		S21316	S23316	S26316	S28316		
	1-11/16	42.86	1.6875		S21317	S23317	S26317	S28317		
		43.00	1.6929		S21318	S23318	S26318	S28318		
	1-23/32	43.66	1.7188		S21319	S23319	S26319	S28319		
		44.00	1.7323		S21320	S23320	S26320	S28320		
	1-3/4	44.45	1.7500		S21321	S23321	S26321	S28321		
		45.00	1.7717		S21322	S23322	S26322	S28322		
	1-25/32	45.24	1.7813		S21323	S23323	S26323	S28323		
		46.00	1.8110		S21324	S23324	S26324	S28324		
	1-13/16	46.04	1.8125		S21325	S23325	S26325	S28325		
	1-27/32	46.83	1.8438		S21326	S23326	S26326	S28326		
		47.00	1.8504		S21327	S23327	S26327	S28327		
	1-7/8	47.63	1.8750		S21328	S23328	S26328	S28328		

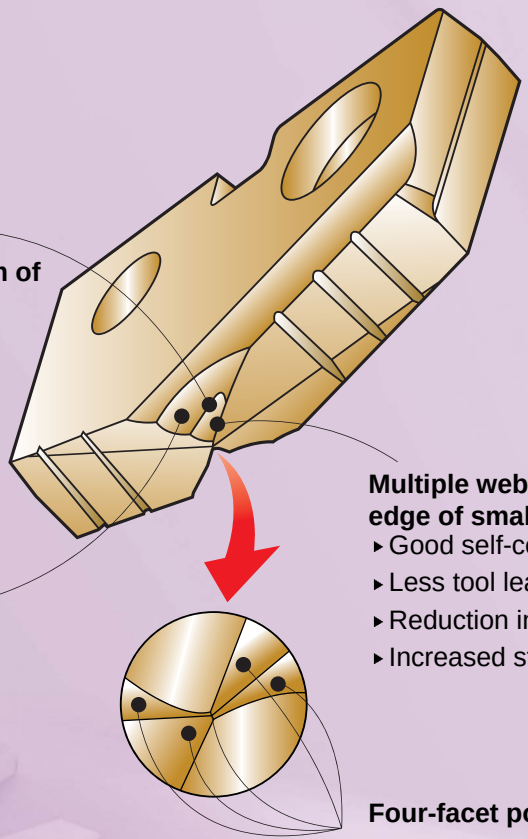
◎ : Excellent ○ : Good

	Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
	~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
C2	○	○	○	○	○	◎	◎	○	○	○	○	◎	○	○	◎	◎
C5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○
C3													◎	◎		

Special features of SM-Point Spade Drill

This new “Hybrid Point” combines the strength of the standard point with additional “Web Thinning”.

This new point increases stability, reduces thrust, improves centering and allows increased speeds and feeds.



Multiple thinning form at the bottom of the large thinning.

- The optimum thinning for the difference from the cutting speed, the cutting quantity and the cutting load according to the distance from the drill point to the cutting edge.

Multiple web thinning with the cutting edge of small web thinning.

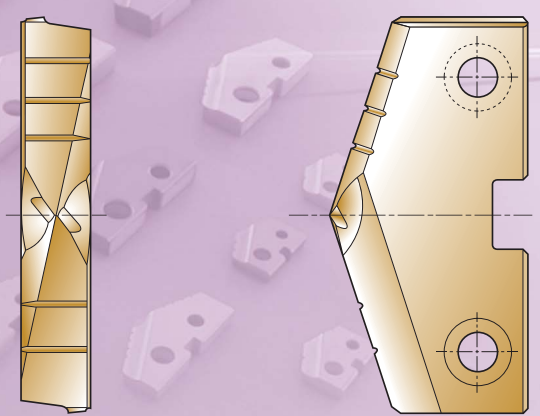
- Good self-centering
- Less tool lead off
- Reduction in bell mouthing, thrust
- Increased stability

Radius back face

- Wide chip space

Four-facet point

- Self-centering
- Less thrust force



SPADE DRILLS

SERIES Y,Z,0,1

SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE : 132 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
Y .374 (9.50) to .436 (11.07) Thick 3/32 (2.4)		9.50	.3740	* SM08Y01
	3/8	9.53	.3750	* SM08Y02
		9.80	.3858	* SM08Y03
	25/64	9.92	.3906	* SM08Y04
		10.00	.3937	* SM08Y05
		10.20	.4016	* SM08Y06
	13/32	10.32	.4062	* SM08Y07
		10.50	.4134	* SM08Y08
	27/64	10.72	.4219	* SM08Y09
		10.80	.4252	* SM08Y10
		11.00	.4331	* SM08Y11
Z .437 (11.11) to .510 (12.95) 3/32(2.4)	7/16	11.11	.4375	* SM08Z01
		11.50	.4528	* SM08Z02
	29/64	11.51	.4531	* SM08Z03
	15/32	11.91	.4688	* SM08Z04
		12.00	.4724	* SM08Z05
	31/64	12.30	.4844	* SM08Z06
		12.50	.4921	* SM08Z07
	1/2	12.70	.5000	* SM08Z08
0 .511 (12.98) to .695 (17.65) Thick 1/8 (3.2)		13.00	.5118	* SM08001
	33/64	13.10	.5156	* SM08002
	17/32	13.49	.5312	* SM08003
		13.50	.5315	* SM08004
	35/64	13.89	.5469	* SM08060
		14.00	.5512	* SM08005
	9/16	14.29	.5625	* SM08006
		14.50	.5709	* SM08007
	37/64	14.68	.5781	* SM08008
		15.00	.5906	* SM08009
	19/32	15.08	.5938	* SM08010
	39/64	15.48	.6094	* SM08061
		15.50	.6102	* SM08011
	5/8	15.88	.6250	* SM08012

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
0 .511 (12.98) to .695 (17.65)		16.00	.6299	* SM08013
	41/64	16.27	.6406	* SM08062
		16.50	.6496	* SM08014
	21/32	16.67	.6562	* SM08015
		17.00	.6693	* SM08016
	43/64	17.07	.6719	* SM08063
	11/16	17.46	.6875	* SM08017
		17.50	.6890	* SM08018
1 .690 (17.53) to .960 (24.38) Thick 5/32 (4.0)	45/64	17.86	.7031	SM08101
		18.00	.7087	SM08102
	23/32	18.26	.7188	SM08103
		18.50	.7283	SM08104
	47/64	18.65	.7344	SM08105
		19.00	.7480	SM08106
	3/4	19.05	.7500	SM08107
	49/64	19.45	.7656	SM08108
		19.50	.7677	SM08109
	25/32	19.84	.7812	SM08110
		20.00	.7874	SM08111
	51/64	20.24	.7969	SM08160
		20.50	.8071	SM08112
	13/16	20.64	.8125	SM08113
		21.00	.8268	SM08114
	27/32	21.43	.8438	SM08115
	55/64	21.83	.8594	SM08161
		22.00	.8661	SM08116
	7/8	22.23	.8750	SM08117
	57/64	22.62	.8906	SM08162
		23.00	.9055	SM08118
	29/32	23.02	.9062	SM08119
	59/64	23.42	.9219	SM08120
	15/16	23.81	.9375	SM08121
		24.00	.9449	SM08122

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

POINT ANGLE : 132 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
2 **.961 (24.41) to 1.380 (35.05)** **Thick** 3 / 16 (4.8)	31 / 32	24.61	.9688	SM08201
	63 / 64	25.00	.9843	SM08202
	1	25.40	1.0000	SM08203
	1-1 / 64	25.80	1.0156	SM08204
		26.00	1.0236	SM08205
	1-1 / 32	26.19	1.0312	SM08206
	1-3 / 64	26.59	1.0469	SM08260
	1-1 / 16	26.99	1.0625	SM08207
		27.00	1.0630	SM08208
	1-3 / 32	27.78	1.0938	SM08209
		28.00	1.1024	SM08210
	1-7 / 64	28.18	1.1094	SM08261
	1-1 / 8	28.58	1.1250	SM08211
		29.00	1.1417	SM08212
	1-5 / 32	29.37	1.1562	SM08213
		30.00	1.1811	SM08214
	1-3 / 16	30.16	1.1875	SM08215
	1-7 / 32	30.96	1.2188	SM08216
		31.00	1.2205	SM08217
	1-1 / 4	31.75	1.2500	SM08218
		32.00	1.2598	SM08219
	1-9 / 32	32.54	1.2812	SM08220
		33.00	1.2992	SM08221
	1-5 / 16	33.34	1.3125	SM08222
		34.00	1.3386	SM08223
	1-11 / 32	34.13	1.3438	SM08224
	1-3 / 8	34.93	1.3750	SM08225
		35.00	1.3780	SM08226

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
3 **1.353 (34.37) to 1.882 (47.80)** **Thick** 1 / 4 (6.4)	1-13 / 32	35.72	1.4062	SM08301
		36.00	1.4173	SM08302
	1-7 / 16	36.51	1.4375	SM08303
		37.00	1.4567	SM08304
	1-15 / 32	37.31	1.4688	SM08305
		38.00	1.4961	SM08306
	1-1 / 2	38.10	1.5000	SM08307
	1-17 / 32	38.89	1.5312	SM08308
		39.00	1.5354	SM08309
	1-9 / 16	39.69	1.5625	SM08310
		40.00	1.5748	SM08311
	1-19 / 32	40.48	1.5938	SM08312
		41.00	1.6142	SM08313
	1-5 / 8	41.28	1.6250	SM08314
		42.00	1.6535	SM08315
	1-21 / 32	42.07	1.6562	SM08316
	1-11 / 16	42.86	1.6875	SM08317
		43.00	1.6929	SM08318
	1-23 / 32	43.66	1.7188	SM08319
		44.00	1.7323	SM08320
	1-3 / 4	44.45	1.7500	SM08321
		45.00	1.7717	SM08322
	1-25 / 32	45.24	1.7812	SM08323
		46.00	1.8110	SM08324
	1-13 / 16	46.04	1.8125	SM08325
	1-27 / 32	46.83	1.8438	SM08326
		47.00	1.8504	SM08327
	1-7 / 8	47.63	1.8750	SM08328

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES 4,5

SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

POINT ANGLE **- under 2-1/2 : 132 degree**
- over 2-1/2 : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
4 **1.850 (46.99) to 2.570 (65.28)** **Thick** 5 / 16 (7.9)		48.00	1.8898	SM08401
	1-29 / 32	48.42	1.9062	SM08402
		49.00	1.9291	SM08403
	1-15 / 16	49.21	1.9375	SM08404
		50.00	1.9685	SM08405
	1-31 / 32	50.01	1.9688	SM08406
	2	50.80	2.0000	SM08407
		51.00	2.0079	SM08408
	2-1 / 32	51.59	2.0312	SM08409
	2-3 / 64	52.00	2.0472	SM08410
	2-1 / 16	52.39	2.0625	SM08411
		53.00	2.0866	SM08412
	2-3 / 32	53.18	2.0938	SM08413
	2-1 / 8	53.98	2.1250	SM08414
		54.00	2.1260	SM08415
	2-5 / 32	54.77	2.1562	SM08416
		55.00	2.1654	SM08417
	2-3 / 16	55.56	2.1875	SM08418
		56.00	2.2047	SM08419
	2-7 / 32	56.36	2.2188	SM08420
		57.00	2.2441	SM08421
	2-1 / 4	57.15	2.2500	SM08422
	2-9 / 32	57.94	2.2812	SM08423
		58.00	2.2835	SM08424
	2-5 / 16	58.74	2.3125	SM08425
		59.00	2.3228	SM08426
	2-11 / 32	59.53	2.3438	SM08427
		60.00	2.3622	SM08428
	2-3 / 8	60.33	2.3750	SM08429
		61.00	2.4016	SM08430
	2-13 / 32	61.12	2.4062	SM08431
	2-7 / 16	61.91	2.4375	SM08432

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
4 **1.850 (46.99) to 2.570 (65.28)**		62.00	2.4409	SM08433
	2-15 / 32	62.71	2.4688	SM08434
		63.00	2.4803	SM08435
	2-1 / 2	63.50	2.5000	SM08436
		64.00	2.5197	SM08437
	2-17 / 32	64.29	2.5312	SM08438
		65.00	2.5591	SM08439
	2-9 / 16	65.09	2.5625	SM08440
5 **2.456 (62.38) to 3.000 (76.20)** **Thick** 7 / 16 (11.1)	2-1 / 2	63.50	2.5000	SM08501
		64.00	2.5197	SM08502
	2-17 / 32	64.29	2.5312	SM08503
	2-9 / 16	65.09	2.5625	SM08504
	2-19 / 32	65.88	2.5938	SM08505
		66.00	2.5984	SM08506
	2-5 / 8	66.68	2.6250	SM08507
	2-21 / 32	67.47	2.6562	SM08508
		68.00	2.6772	SM08509
	2-11 / 16	68.26	2.6875	SM08510
	2-23 / 32	69.05	2.7188	SM08511
	2-3 / 4	69.85	2.7500	SM08512
		70.00	2.7559	SM08513
	2-25 / 32	70.64	2.7812	SM08514
	2-13 / 16	71.44	2.8125	SM08515
		72.00	2.8346	SM08516
	2-27 / 32	72.23	2.8438	SM08517
	2-7 / 8	73.03	2.8750	SM08518
	2-29 / 32	73.82	2.9062	SM08519
		74.00	2.9134	SM08520
	2-15 / 16	74.61	2.9375	SM08521
	2-31 / 32	75.41	2.9688	SM08522
		76.00	2.9921	SM08523
	3	76.20	3.0000	SM08524

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

POINT ANGLE : 144 degree

cutting conditions : p.231

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
6 **3.001 (76.23) to 3.507 (89.08)** **Thick** 7 / 16 (11.1)	3-1 / 32	76.99	3.0312	SM08601
	3-1 / 16	77.79	3.0625	SM08602
		78.00	3.0709	SM08603
	3-3 / 32	78.58	3.0938	SM08604
	3-1 / 8	79.38	3.1250	SM08605
		80.00	3.1496	SM08606
	3-5 / 32	80.17	3.1562	SM08607
	3-3 / 16	80.96	3.1875	SM08608
	3-7 / 32	81.76	3.2188	SM08609
		82.00	3.2283	SM08610
	3-1 / 4	82.55	3.2500	SM08611
	3-9 / 32	83.34	3.2812	SM08612
		84.00	3.3071	SM08613
	3-5 / 16	84.14	3.3125	SM08614
	3-11 / 32	84.93	3.3438	SM08615
	3-3 / 8	85.73	3.3750	SM08616
		86.00	3.3858	SM08617
	3-13 / 32	86.52	3.4063	SM08618
	3-7 / 16	87.31	3.4375	SM08619
		88.00	3.4646	SM08620
	3-15 / 32	88.11	3.4688	SM08621
	3-1 / 2	88.90	3.5000	SM08622
7 **3.455 (87.76) to 4.000 (101.60)**	3-17 / 32	89.69	3.5312	SM08701
		90.00	3.5433	SM08702
	3-9 / 16	90.49	3.5625	SM08703
	3-19 / 32	91.28	3.5938	SM08704
		92.00	3.6221	SM08705
	3-5 / 8	92.08	3.6250	SM08706
	3-21 / 32	92.87	3.6562	SM08707
	3-11 / 16	93.66	3.6875	SM08708

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
7 **3.455 (87.76) to 4.000 (101.60)** **Thick** 7 / 16 (11.1)		94.00	3.7008	SM08709
	3-23 / 32	94.46	3.7188	SM08710
	3-3 / 4	95.25	3.7500	SM08711
		96.00	3.7795	SM08712
	3-25 / 32	96.04	3.7812	SM08713
	3-13 / 16	96.84	3.8125	SM08714
	3-27 / 32	97.63	3.8438	SM08715
		98.00	3.8583	SM08716
	3-7 / 8	98.43	3.8750	SM08717
	3-29 / 32	99.22	3.9062	SM08718
		100.00	3.9370	SM08719
	3-15 / 16	100.01	3.9375	SM08720
	3-31 / 32	100.81	3.9688	SM08721
	4	101.60	4.0000	SM08722
8 **4.001 (101.63) to 4.507 (114.48)** **Thick** 7 / 16 (11.1)	4-1 / 64	102.00	4.0156	SM08801
	4-1 / 16	103.19	4.0625	SM08802
	4-3 / 32	104.00	4.0945	SM08803
	4-1 / 8	104.78	4.1250	SM08804
		106.00	4.1732	SM08805
	4-3 / 16	106.36	4.1875	SM08806
	4-1 / 4	107.95	4.2500	SM08807
		108.00	4.2520	SM08808
	4-5 / 16	109.54	4.3125	SM08809
		110.00	4.3307	SM08810
	4-3 / 8	111.13	4.3750	SM08811
		112.00	4.4094	SM08812
	4-7 / 16	112.71	4.4375	SM08813
		114.00	4.4882	SM08814
	4-1 / 2	114.30	4.5000	SM08815

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

SPADE DRILLS

SERIES Y,Z,0,1

SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- ▶ Improved stability and hole straightness by newly developed chip thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.
- ▶ Increased speeds & feeds

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
Y .374 (9.50) to .436 (11.07) Thick 3/32 (2.4)		9.50	.3740	* SM28Y01
	3/8	9.53	.3750	* SM28Y02
		9.80	.3858	* SM28Y03
	25/64	9.92	.3906	* SM28Y04
		10.00	.3937	* SM28Y05
		10.20	.4016	* SM28Y06
	13/32	10.32	.4062	* SM28Y07
		10.50	.4134	* SM28Y08
	27/64	10.72	.4219	* SM28Y09
		10.80	.4252	* SM28Y10
		11.00	.4331	* SM28Y11
Z .437 (11.11) to .510 (12.95) 3/32(2.4)	7/16	11.11	.4375	* SM28Z01
		11.50	.4528	* SM28Z02
	29/64	11.51	.4531	* SM28Z03
	15/32	11.91	.4688	* SM28Z04
		12.00	.4724	* SM28Z05
	31/64	12.30	.4844	* SM28Z06
		12.50	.4921	* SM28Z07
	1/2	12.70	.5000	* SM28Z08
0 .511 (12.98) to .695 (17.65) Thick 1/8 (3.2)		13.00	.5118	* SM28001
	33/64	13.10	.5156	* SM28002
	17/32	13.49	.5312	* SM28003
		13.50	.5315	* SM28004
	35/64	13.89	.5469	* SM28060
		14.00	.5512	* SM28005
	9/16	14.29	.5625	* SM28006
		14.50	.5709	* SM28007
	37/64	14.68	.5781	* SM28008
		15.00	.5906	* SM28009
	19/32	15.08	.5938	* SM28010
	39/64	15.48	.6094	* SM28061
		15.50	.6102	* SM28011
	5/8	15.88	.6250	* SM28012

Series Min. to Max. (inch/mm)	Diameter Fractional (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	EDP No. TiAlN
0 .511 (12.98) to .695 (17.65)		16.00	.6299	* SM28013
	41/64	16.27	.6406	* SM28062
		16.50	.6496	* SM28014
	21/32	16.67	.6562	* SM28015
		17.00	.6693	* SM28016
	43/64	17.07	.6719	* SM28063
	11/16	17.46	.6875	* SM28017
		17.50	.6890	* SM28018
1 .690 (17.53) to .960 (24.38) Thick 5/32 (4.0)	45/64	17.86	.7031	SM28101
		18.00	.7087	SM28102
	23/32	18.26	.7188	SM28103
		18.50	.7283	SM28104
	47/64	18.65	.7344	SM28105
		19.00	.7480	SM28106
	3/4	19.05	.7500	SM28107
	49/64	19.45	.7656	SM28108
		19.50	.7677	SM28109
	25/32	19.84	.7812	SM28110
		20.00	.7874	SM28111
	51/64	20.24	.7969	SM28160
		20.50	.8071	SM28112
	13/16	20.64	.8125	SM28113
		21.00	.8268	SM28114
	27/32	21.43	.8438	SM28115
	55/64	21.83	.8594	SM28161
		22.00	.8661	SM28116
	7/8	22.23	.8750	SM28117
	57/64	22.62	.8906	SM28162
		23.00	.9055	SM28118
	29/32	23.02	.9062	SM28119
	59/64	23.42	.9219	SM28120
	15/16	23.81	.9375	SM28121
		24.00	.9449	SM28122

* 2pcs per package

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- ▶ Improved stability and hole straightness by newly developed chip thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.
- ▶ Increased speeds & feeds

POINT ANGLE : 132 degree

cutting conditions : p.232

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
2 **.961 (24.41) to 1.380 (35.05)** **Thick** 3 / 16 (4.8)	31 / 32	24.61	.9688	SM28201
	63 / 64	25.00	.9843	SM28202
	1	25.40	1.0000	SM28203
	1-1 / 64	25.80	1.0156	SM28204
		26.00	1.0236	SM28205
	1-1 / 32	26.19	1.0312	SM28206
	1-3 / 64	26.59	1.0469	SM28260
	1-1 / 16	26.99	1.0625	SM28207
		27.00	1.0630	SM28208
	1-3 / 32	27.78	1.0938	SM28209
		28.00	1.1024	SM28210
	1-7 / 64	28.18	1.1094	SM28261
	1-1 / 8	28.58	1.1250	SM28211
		29.00	1.1417	SM28212
	1-5 / 32	29.37	1.1562	SM28213
		30.00	1.1811	SM28214
	1-3 / 16	30.16	1.1875	SM28215
	1-7 / 32	30.96	1.2188	SM28216
		31.00	1.2205	SM28217
	1-1 / 4	31.75	1.2500	SM28218
		32.00	1.2598	SM28219
	1-9 / 32	32.54	1.2812	SM28220
		33.00	1.2992	SM28221
	1-5 / 16	33.34	1.3125	SM28222
		34.00	1.3386	SM28223
	1-11 / 32	34.13	1.3438	SM28224
	1-3 / 8	34.93	1.3750	SM28225
		35.00	1.3780	SM28226

Series Min. to Max. (inch/mm)	Diameter			EDP No.
	Fractional (inch)	Metric (mm)	Decimal (inch)	TiAIN
3 **1.353 (34.37) to 1.882 (47.80)** **Thick** 1 / 4 (6.4)	1-13 / 32	35.72	1.4062	SM28301
		36.00	1.4173	SM28302
	1-7 / 16	36.51	1.4375	SM28303
		37.00	1.4567	SM28304
	1-15 / 32	37.31	1.4688	SM28305
		38.00	1.4961	SM28306
	1-1 / 2	38.10	1.5000	SM28307
	1-17 / 32	38.89	1.5312	SM28308
		39.00	1.5354	SM28309
	1-9 / 16	39.69	1.5625	SM28310
		40.00	1.5748	SM28311
	1-19 / 32	40.48	1.5938	SM28312
		41.00	1.6142	SM28313
	1-5 / 8	41.28	1.6250	SM28314
		42.00	1.6535	SM28315
	1-21 / 32	42.07	1.6562	SM28316
	1-11 / 16	42.86	1.6875	SM28317
		43.00	1.6929	SM28318
	1-23 / 32	43.66	1.7188	SM28319
		44.00	1.7323	SM28320
	1-3 / 4	44.45	1.7500	SM28321
		45.00	1.7717	SM28322
	1-25 / 32	45.24	1.7812	SM28323
		46.00	1.8110	SM28324
	1-13 / 16	46.04	1.8125	SM28325
	1-27 / 32	46.83	1.8438	SM28326
		47.00	1.8504	SM28327
	1-7 / 8	47.63	1.8750	SM28328

◎ : Excellent ○ : Good

Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○

SPADE DRILLS

SERIES Y,Z,0,1,2

SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15

POINT ANGLE : 180 degree

cutting conditions : p.233

Series	Diameter		EDP No.	
	Fractional (inch)	Decimal (inch)	TiN	TiAIN
Y	3 / 8	.3750	* SF05024	* SF15024
	13 / 32	.4063	* SF05026	* SF15026
Z	7 / 16	.4375	* SF05028	* SF15028
	15 / 32	.4688	* SF05030	* SF15030
	1 / 2	.5000	* SF05032	* SF15032
0	17 / 32	.5313	* SF05034	* SF15034
	9 / 16	.5625	* SF05036	* SF15036
	19 / 32	.5938	* SF05038	* SF15038
	5 / 8	.6250	* SF05040	* SF15040
	21 / 32	.6563	* SF05042	* SF15042
	11 / 16	.6875	* SF05044	* SF15044
1	23 / 32	.7188	SF05046	SF15046
	3 / 4	.7500	SF05048	SF15048
	25 / 32	.7813	SF05050	SF15050
	13 / 16	.8125	SF05052	SF15052
	27 / 32	.8438	SF05054	SF15054
	7 / 8	.8750	SF05056	SF15056
	29 / 32	.9063	SF05058	SF15058
	15 / 16	.9375	SF05060	SF15060

Series	Diameter		EDP No.	
	Fractional (inch)	Decimal (inch)	TiN	TiAIN
2	31 / 32	.9688	SF05062	SF15062
	1	1.0000	SF05100	SF15100
	1-1 / 32	1.0313	SF05102	SF15102
	1-1 / 16	1.0625	SF05104	SF15104
	1-3 / 32	1.0938	SF05106	SF15106
	1-1 / 8	1.1250	SF05108	SF15108
	1-5 / 32	1.1563	SF05110	SF15110
	1-3 / 16	1.1875	SF05112	SF15112
	1-7 / 32	1.2188	SF05114	SF15114
	1-1 / 4	1.2500	SF05116	SF15116
	1-9 / 32	1.2813	SF05118	SF15118
	1-5 / 16	1.3125	SF05120	SF15120
	1-11 / 32	1.3438	SF05122	SF15122
	1-3 / 8	1.3750	SF05124	SF15124

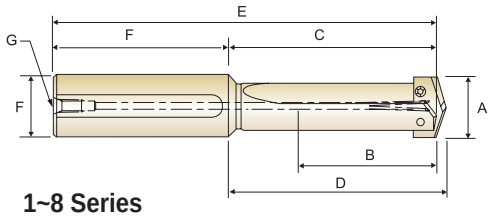
* 2pcs per package

◎ : Excellent ○ : Good

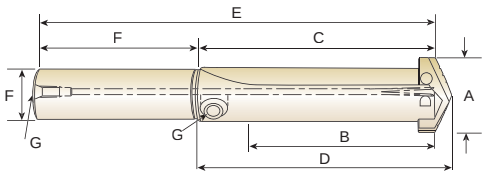
Non-alloyed Steels, Free Machining Steels	Carbon Steels		Alloy Steels		High Alloyed steels		Structural Steels		Tool Steels		Stainless Steels	Cast Iron		Aluminum	Copper Alloys
~HRc24 (~HB250)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc28 (~HB275)	HRc28~ (HB275~)	~HRc37 (~HB350)	HRc37~ (HB350~)	~HRc24 (~HB250)	HRc24~ (HB250~)	~HRc13 (~HB200)	HRc13~ (HB200~)	~HRc28 (~HB275)	~HRc19 (~HB220)	HRc19~ (HB220~)	~HRc8 (~HB180)	~HB110
◎	◎	◎	◎	○	○	○	◎	◎	○	○	○	○	◎	○	○

STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

Y~0.5 Series



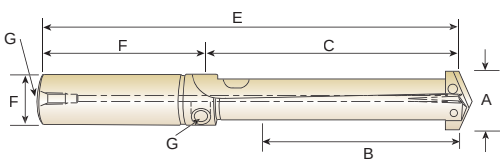
1~8 Series



SHORT LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P13Y01	3 / 8 – 27 / 64	1-1 / 4	2-1 / 32	2-1 / 8	4-13 / 32	3 / 4	2-3 / 8	1 / 8
Z	P13Z01	7 / 16 – 1 / 2	1-1 / 4	2-1 / 32	2-1 / 8	4-13 / 32	3 / 4	2-3 / 8	1 / 8
0	P13001	33 / 64 – 11 / 16	1-3 / 8	2-3 / 16	2-19 / 64	4-9 / 16	3 / 4	2-3 / 8	1 / 8
0.5	P13051	39 / 64 – 11 / 16	1-3 / 8	2-3 / 16	2-19 / 64	4-9 / 16	3 / 4	2-3 / 8	1 / 8
1	P13101	45 / 64 – 15 / 16	2-5 / 8	3-7 / 8	4-1 / 64	6-7 / 8	3 / 4	3	1 / 8
	P13102	45 / 64 – 15 / 16	2-5 / 8	3-7 / 8	4-1 / 64	6-7 / 8	1	3	1 / 8
1.5	P13151	55 / 64 – 15 / 16	2-5 / 8	3-7 / 8	4-1 / 64	6-7 / 8	3 / 4	3	1 / 8
	P13152	55 / 64 – 15 / 16	2-5 / 8	3-7 / 8	4-1 / 64	6-7 / 8	1	3	1 / 8
2	P13202	31 / 32 – 1-3 / 8	3-3 / 8	4-1 / 2	4-41 / 64	8	1	3-1 / 2	1 / 8
	P13203	31 / 32 – 1-3 / 8	3-3 / 8	4-1 / 2	4-41 / 64	8	1-1 / 4	3-1 / 2	1 / 8
2.5	P13252	1-3 / 16 – 1-3 / 8	3-3 / 8	4-1 / 2	4-41 / 64	8	1	3-1 / 2	1 / 8
	P13253	1-3 / 16 – 1-3 / 8	3-3 / 8	4-1 / 2	4-41 / 64	8	1-1 / 4	3-1 / 2	1 / 8
3	P13303	1-13 / 32 – 1-7 / 8	4-3 / 4	6	6-3 / 16	10	1-1 / 4	4	1 / 4
	P13304	1-13 / 32 – 1-7 / 8	4-3 / 4	6	6-3 / 16	10	1-1 / 2	4	1 / 4
4	P13404	1-29 / 32 – 2-9 / 16	5-1 / 8	6-1 / 2	6-11 / 16	10-1 / 2	1-1 / 2	4	1 / 4
	P13405	1-29 / 32 – 2-9 / 16	5-1 / 8	6-1 / 2	6-11 / 16	10-1 / 2	1-3 / 4	4	1 / 4
5-6	P13506	2-1 / 2 – 3-1 / 2	6-3 / 4	8-1 / 2	8-3 / 4	12-1 / 2	2	4	1 / 2
7-8	P13708	3-17 / 32 – 4-1 / 2	6-3 / 4	8-7 / 8	9-1 / 8	13-7 / 8	3	5	1 / 2



INTERMEDIATE LENGTH

Unit : Inch

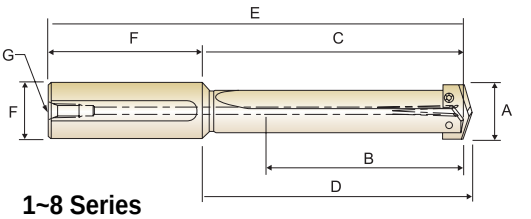
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Overall Length	Shank		Pipe Tap
						Dia.	Length	
		A	B	C	E	F		G
1	P14102	45 / 64 – 15 / 16	4-5 / 8	5-7 / 8	8-7 / 8	1	3	1 / 8
1.5	P14152	55 / 64 – 15 / 16	4-5 / 8	5-7 / 8	8-7 / 8	1	3	1 / 8
2	P14203	31 / 32 – 1-3 / 8	5-3 / 8	6-1 / 2	10	1-1 / 4	3-1 / 2	1 / 8
2.5	P14253	1-3 / 16 – 1-3 / 8	5-3 / 8	6-1 / 2	10	1-1 / 4	3-1 / 2	1 / 8
3	P14304	1-13 / 32 – 1-7 / 8	6-1 / 2	7-3 / 4	11-3 / 4	1-1 / 2	4	1 / 4

SPADE DRILLS

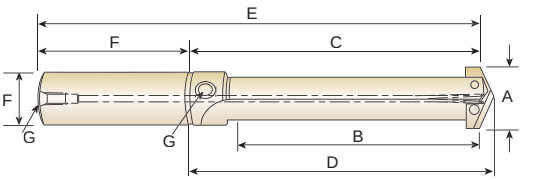
P15 SERIES
P16 SERIES

STRAIGHT SHANK HOLDER, STRAIGHT FLUTE

Y~0.5 Series



1~8 Series

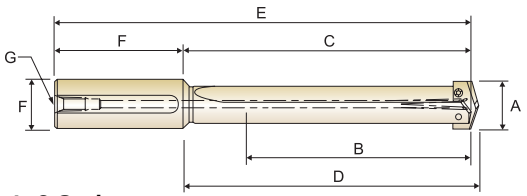


STANDARD LENGTH

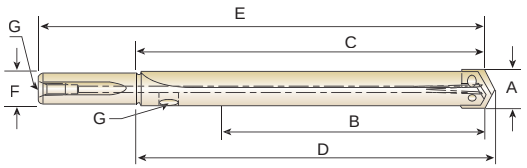
Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P15Y01	3 / 8 – 27 / 64	2-3 / 8	3-5 / 32	3-1 / 4	5-17 / 32	3 / 4	2-3 / 8	1 / 8
Z	P15Z01	7 / 16 – 1 / 2	2-3 / 8	3-5 / 32	3-1 / 4	5-17 / 32	3 / 4	2-3 / 8	1 / 8
0	P15001	33 / 64 – 11 / 16	2-1 / 2	3-5 / 16	3-27 / 64	5-11 / 16	3 / 4	2-3 / 8	1 / 8
0.5	P15051	39 / 64 – 11 / 16	2-1 / 2	3-5 / 16	3-27 / 64	5-11 / 16	3 / 4	2-3 / 8	1 / 8
1	P15101	45 / 64 – 15 / 16	6-5 / 8	7-7 / 8	8-1 / 64	10-7 / 8	3 / 4	3	1 / 8
	P15102	45 / 64 – 15 / 16	6-5 / 8	7-7 / 8	8-1 / 64	10-7 / 8	1	3	1 / 8
1.5	P15151	55 / 64 – 15 / 16	6-5 / 8	7-7 / 8	8-1 / 64	10-7 / 8	3 / 4	3	1 / 8
	P15152	55 / 64 – 15 / 16	6-5 / 8	7-7 / 8	8-1 / 64	10-7 / 8	1	3	1 / 8
2	P15202	31 / 32 – 1-3 / 8	7-3 / 8	8-1 / 2	8-41 / 64	12	1	3-1 / 2	1 / 8
	P15203	31 / 32 – 1-3 / 8	7-3 / 8	8-1 / 2	8-41 / 64	12	1-1 / 4	3-1 / 2	1 / 8
2.5	P15252	1-3 / 16 – 1-3 / 8	7-3 / 8	8-1 / 2	8-41 / 64	12	1	3-1 / 2	1 / 8
	P15253	1-3 / 16 – 1-3 / 8	7-3 / 8	8-1 / 2	8-41 / 64	12	1-1 / 4	3-1 / 2	1 / 8
3	P15303	1-13 / 32 – 1-7 / 8	8-1 / 4	9-1 / 2	9-11 / 16	13-1 / 2	1-1 / 4	4	1 / 4
	P15304	1-13 / 32 – 1-7 / 8	8-1 / 4	9-1 / 2	9-11 / 16	13-1 / 2	1-1 / 2	4	1 / 4
4	P15404	1-29 / 32 – 2-9 / 16	9-1 / 8	10-1 / 2	10-11 / 16	14-1 / 2	1-1 / 2	4	1 / 4
	P15405	1-29 / 32 – 2-9 / 16	9-1 / 8	10-1 / 2	10-11 / 16	14-1 / 2	1-3 / 4	4	1 / 4
5-6	P15506	2-1 / 2 – 3-1 / 2	10-3 / 4	12-1 / 2	12-3 / 4	16-1 / 2	2	4	1 / 2
7-8	P15708	3-17 / 32 – 4-1 / 2	10-3 / 4	12-7 / 8	13-1 / 8	17-7 / 8	3	5	1 / 2

Y~0.5 Series



1~8 Series



EXTENDED LENGTH

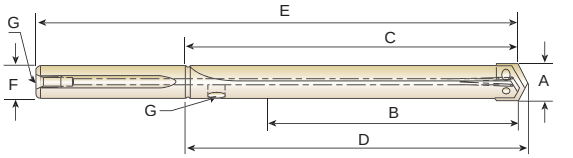
Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	**P16Y01**	3 / 8 – 27 / 64	4-3 / 8	5-5 / 32	5-1 / 4	7-17 / 32	3 / 4	2-3 / 8	1 / 8
Z	**P16Z01**	7 / 16 – 1 / 2	4-3 / 8	5-5 / 32	5-1 / 4	7-17 / 32	3 / 4	2-3 / 8	1 / 8
0	**P16001**	33 / 64 – 11 / 16	4-1 / 2	5-5 / 16	5-27 / 64	7-11 / 16	3 / 4	2-3 / 8	1 / 8
0.5	**P16051**	39 / 64 – 11 / 16	4-1 / 2	5-5 / 16	5-27 / 64	7-11 / 16	3 / 4	2-3 / 8	1 / 8
1	**P16102**	45 / 64 – 15 / 16	10-5 / 8	11-7 / 8	12-1 / 64	14-7 / 8	1	3	1 / 8
1.5	**P16152**	55 / 64 – 15 / 16	10-5 / 8	11-7 / 8	12-1 / 64	14-7 / 8	1	3	1 / 8
2	**P16203**	31 / 32 – 1-3 / 8	11-3 / 8	12-1 / 2	12-41 / 64	16	1-1 / 4	3-1 / 2	1 / 8
2.5	**P16253**	1-3 / 16 – 1-3 / 8	11-3 / 8	12-1 / 2	12-41 / 64	16	1-1 / 4	3-1 / 2	1 / 8
3	**P16303**	1-13 / 32 – 1-7 / 8	13-3 / 4	15	15-3 / 16	19	1-1 / 4	4	1 / 4
4	**P16404**	1-29 / 32 – 2-9 / 16	16-5 / 8	18	18-3 / 16	22	1-1 / 2	4	1 / 4
5	**P16506**	2-1 / 2 – 3-1 / 2	18-1 / 4	20	20-1 / 4	24	2	4	1 / 2
7	**P16708**	3-17 / 32 – 4-1 / 2	21-7 / 8	24	24-1 / 4	29	3	5	1 / 2

SPADE DRILLS

P17 SERIES

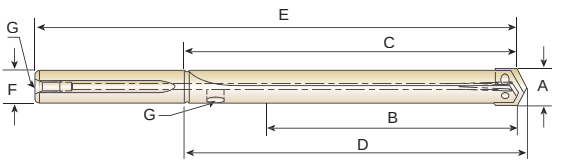
STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



LONG LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
0	P17001	33/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8
0.5	P17051	39/64 – 11/16	7	7-13/16	7-59/64	10-3/16	3/4	2-3/8	1/8

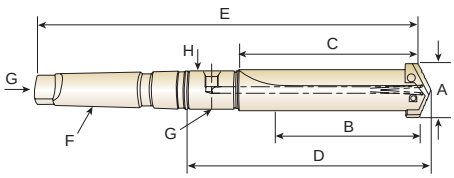


EXTRA LONG LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P17101	45/64 – 15/16	18	19-1/4	19-25/64	22-1/4	1	3	1/8
2	P17202	31/32 – 1-3/8	20-1/8	21-1/4	21-25/64	24-3/4	1-1/4	3-1/2	1/8
3	P17303	1-13/32 – 1-7/8	22	23-1/4	23-7/16	27-1/4	1-1/2	4	1/4
4	P17404	1-29/32 – 2-9/16	24-5/8	26	26-3/16	30	1-1/2	4	1/4
5	P17506	2-1/2 – 3-1/2	26	27-3/4	28	31-3/4	2	4	1/2
7	P17708	3-17/32 – 4-1/2	27	29-1/8	29-3/8	34-1/8	3	5	1/2

TAPER SHANK HOLDER, STRAIGHT FLUTE / HELICAL FLUTE

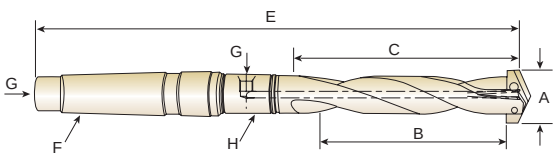


SHORT LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
Y	P01Y02	3 / 8 – 27 / 64	1-1 / 4	2-1 / 32	3-15 / 32	6-5 / 16	#2	1 / 16	PR1030
Z	P01Z02	7 / 16 – 1 / 2	1-1 / 4	2-1 / 32	3-15 / 32	6-5 / 16	#2	1 / 16	PR1030
0	P01002	33 / 64 – 11 / 16	1-3 / 8	2-3 / 16	3-41 / 64	6-15 / 32	#2	1 / 16	PR1030
0.5	P01052	39 / 64 – 11 / 16	1-3 / 8	2-3 / 16	3-41 / 64	6-15 / 32	#2	1 / 16	PR1030
1	P01103	45 / 64 – 15 / 16	2-3 / 4	3-7 / 8	5-39 / 64	9-5 / 32	#3	1 / 8	PR1031
	P01104	45 / 64 – 15 / 16	2-3 / 4	3-7 / 8	5-43 / 64	10-5 / 32	#4	1 / 8	PR1031
1.5	P01153	55 / 64 – 15 / 16	2-3 / 4	3-7 / 8	5-39 / 64	9-5 / 32	#3	1 / 8	PR1031
	P01154	55 / 64 – 15 / 16	2-3 / 4	3-7 / 8	5-43 / 64	10-5 / 32	#4	1 / 8	PR1031
2	P01203	31 / 32 – 1-3 / 8	3-3 / 8	4-1 / 2	6-15 / 64	9-25 / 32	#3	1 / 8	PR1031
	P01204	31 / 32 – 1-3 / 8	3-3 / 8	4-1 / 2	6-19 / 64	10-25 / 32	#4	1 / 8	PR1031
2.5	P01253	1-3 / 16 – 1-3 / 8	3-3 / 8	4-1 / 2	6-15 / 64	9-25 / 32	#3	1 / 8	PR1031
	P01254	1-3 / 16 – 1-3 / 8	3-3 / 8	4-1 / 2	6-37 / 64	11-1 / 16	#4	1 / 4	PR1042
3	P01304	1-13 / 32 – 1-7 / 8	4-3 / 4	6	8-1 / 8	12-9 / 16	#4	1 / 4	PR1042
	P01305	1-13 / 32 – 1-7 / 8	4-3 / 4	6	8-1 / 8	13-13 / 16	#5	1 / 4	PR1043
4	P01404	1-29 / 32 – 2-9 / 16	5-1 / 8	6-1 / 2	8-5 / 8	13-1 / 16	#4	1 / 4	PR1042
	P01405	1-29 / 32 – 2-9 / 16	5-1 / 8	6-1 / 2	8-5 / 8	14-5 / 16	#5	1 / 4	PR1043
5-6	P01505	2-1 / 2 – 3-1 / 2	6-3 / 4	8-1 / 2	11-5 / 16	16-15 / 16	#5	1 / 2	PR1054
7-8	P01705	3-17 / 32 – 4-1 / 2	6-3 / 4	8-7 / 8	11-11 / 16	17-5 / 16	#5	1 / 2	PR1054

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 230)



INTERMEDIATE LENGTH

Unit : Inch

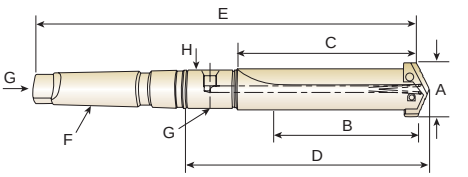
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	E	F	G	H
1	P08103	45 / 64 – 15 / 16	4-3 / 4	5-7 / 8	11-5 / 32	#3	1 / 8	PR1031
1.5	P08153	55 / 64 – 15 / 16	4-3 / 4	5-7 / 8	11-5 / 32	#3	1 / 8	PR1031
2	P08204	31 / 32 – 1-3 / 8	5-3 / 8	6-1 / 2	12-25 / 32	#4	1 / 8	PR1031
2.5	P08254	1-3 / 16 – 1-3 / 8	5-3 / 8	6-1 / 2	13-1 / 16	#4	1 / 4	PR1042

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 230)

SPADE DRILLS

P03 SERIES

TAPER SHANK HOLDER, STRAIGHT FLUTE



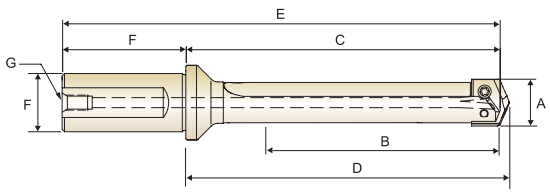
STANDARD LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	MT	Pipe Tap	RCI
		A	B	C	D	E	F	G	H
Y	P03Y02	3 / 8 – 27 / 64	2-3 / 8	3-5 / 32	4-19 / 32	7-7 / 16	#2	1 / 16	PR1030
Z	P03Z02	7 / 16 – 1 / 2	2-3 / 8	3-5 / 32	4-19 / 32	7-7 / 16	#2	1 / 16	PR1030
0	P03002	33 / 64 – 11 / 16	2-1 / 2	3-5 / 16	4-49 / 64	7-19 / 32	#2	1 / 16	PR1030
0.5	P03052	39 / 64 – 11 / 16	2-1 / 2	3-5 / 16	4-49 / 64	7-19 / 32	#2	1 / 16	PR1030
1	P03103	45 / 64 – 15 / 16	6-3 / 4	7-7 / 8	9-39 / 64	13-5 / 32	#3	1 / 8	PR1031
	P03104	45 / 64 – 15 / 16	6-3 / 4	7-7 / 8	9-43 / 64	14-5 / 32	#4	1 / 8	PR1031
1.5	P03153	55 / 64 – 15 / 16	6-3 / 4	7-7 / 8	9-39 / 64	13-5 / 32	#3	1 / 8	PR1031
	P03154	55 / 64 – 15 / 16	6-3 / 4	7-7 / 8	9-43 / 64	14-5 / 32	#4	1 / 8	PR1031
2	P03203	31 / 32 – 1-3 / 8	7-3 / 8	8-1 / 2	10-15 / 64	13-25 / 32	#3	1 / 8	PR1031
	P03204	31 / 32 – 1-3 / 8	7-3 / 8	8-1 / 2	10-19 / 64	14-25 / 32	#4	1 / 8	PR1031
2.5	P03253	1-3 / 16 – 1-3 / 8	7-3 / 8	8-1 / 2	10-15 / 64	13-25 / 32	#3	1 / 8	PR1031
	P03254	1-3 / 16 – 1-3 / 8	7-3 / 8	8-1 / 2	10-37 / 64	15-1 / 16	#4	1 / 4	PR1042
3	P03304	1-13 / 32 – 1-7 / 8	8-1 / 4	9-1 / 2	11-5 / 8	16-1 / 16	#4	1 / 4	PR1042
	P03305	1-13 / 32 – 1-7 / 8	8-1 / 4	9-1 / 2	11-5 / 8	17-5 / 16	#5	1 / 4	PR1043
4	P03404	1-29 / 32 – 2-9 / 16	9-1 / 8	10-1 / 2	12-5 / 8	17-1 / 16	#4	1 / 4	PR1042
	P03405	1-29 / 32 – 2-9 / 16	9-1 / 8	10-1 / 2	12-5 / 8	18-5 / 16	#5	1 / 4	PR1043
5-6	P03505	2-1 / 2 – 3-1 / 2	10-3 / 4	12-1 / 2	15-5 / 16	20-15 / 16	#5	1 / 2	PR1054
7-8	P03705	3-17 / 32 – 4-1 / 2	10-3 / 4	12-7 / 8	15-11 / 16	21-5 / 16	#5	1 / 2	PR1054

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 230)

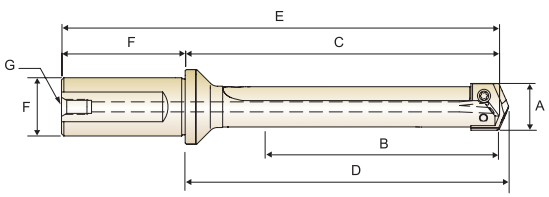
FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



SHORT LENGTH SPADE DRILL HOLDER

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P25Y01	3 / 8 – 27 / 64	1-1 / 4	2-13 / 32	2-1 / 2	4-7 / 16	3 / 4	2-1 / 32	1 / 8
Z	P25Y01	7 / 16 – 1 / 2	1-1 / 4	2-13 / 32	2-1 / 2	4-7 / 16	3 / 4	2-1 / 32	1 / 8
0	P25001	33 / 64 – 11 / 16	1-3 / 8	2-1 / 2	2-39 / 64	4-17 / 32	3 / 4	2-1 / 32	1 / 8
0.5	P25051	39 / 64 – 11 / 16	1-3 / 8	2-1 / 2	2-39 / 64	4-17 / 32	3 / 4	2-1 / 32	1 / 8
1	P25102	45 / 64 – 15 / 16	2-5 / 8	4-7 / 32	4-23 / 64	6-1 / 2	1	2-9 / 32	1 / 8
1.5	P25152	55 / 64 – 15 / 16	2-5 / 8	4-7 / 32	4-23 / 64	6-1 / 2	1	2-9 / 32	1 / 8
2	P25203	31 / 32 – 1-3 / 8	3-3 / 8	5-1 / 16	5-13 / 64	7-11 / 32	1-1 / 4	2-9 / 32	1 / 4
2.5	P25253	1-3 / 16 – 1-3 / 8	3-3 / 8	5-1 / 16	5-13 / 64	7-11 / 32	1-1 / 4	2-9 / 32	1 / 4
3	P25303	1-13 / 32 – 1-7 / 8	4-3 / 4	6-13 / 16	7	9-1 / 2	1-1 / 2	2-11 / 16	1 / 4
4	P25404	1-29 / 32 – 2-9 / 16	5-1 / 8	7-1 / 16	7-1 / 4	9-3 / 4	1-1 / 2	2-11 / 16	1 / 4



INTERMEDIATED LENGTH

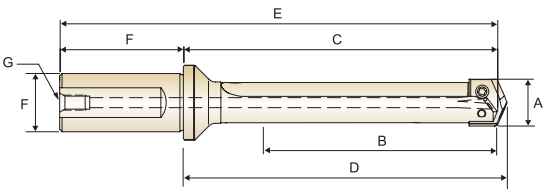
Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
1	P26102	45 / 64 ~ 15 / 16	4-5 / 8	6-3 / 32	6-15 / 64	8-3 / 8	1	2-9 / 32	1 / 8
1.5	P26152	55 / 64 ~ 15 / 16	4-5 / 8	6-3 / 32	6-15 / 64	8-3 / 8	1	2-9 / 32	1 / 8
2	P26203	31 / 32 ~ 1-3 / 8	5-3 / 8	7-1 / 16	7-13 / 64	9-11 / 32	1-1 / 4	2-9 / 32	1 / 4
2.5	P26253	1-3 / 16 ~ 1-3 / 8	5-3 / 8	7-1 / 16	7-13 / 64	9-11 / 32	1-1 / 4	2-9 / 32	1 / 4
3	P26304	1-13 / 32 ~ 1-7 / 8	6-1 / 2	8-9 / 16	8-3 / 4	11-1 / 4	1-1 / 2	2-11 / 32	1 / 4

SPADE DRILLS

P27 SERIES
P28 SERIES

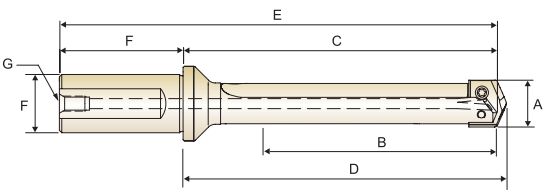
FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



STANDARD LENGTH

Unit : Inch

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P27Y01	3/8 ~ 27/64	2-3/8	3-17/32	3-5/8	5-9/16	3/4	2-1/32	1/8
Z	P27Z01	7/16 ~ 1/2	2-3/8	3-17/32	3-5/8	5-9/16	3/4	2-1/32	1/8
0	P27001	33/64 ~ 11/16	2-1/2	3-5/8	3-47/64	5-21/32	3/4	2-1/32	1/8
0.5	P27051	39/64 ~ 11/16	2-1/2	3-5/8	3-47/64	5-21/32	3/4	2-1/32	1/8
1	P27102	45/64 ~ 15/16	6-5/8	8-3/32	8-15/64	10-3/8	1	2-9/32	1/8
1.5	P27152	55/64 ~ 15/16	6-5/8	8-3/32	8-15/64	10-3/8	1	2-9/32	1/8
2	P27203	31/32 ~ 1-3/8	7-3/8	9-1/16	9-13/64	11-11/32	1-1/4	2-9/32	1/4
2.5	P27253	1-3/16 ~ 1-3/8	7-3/8	9-1/16	9-13/64	11-11/32	1-1/4	2-9/32	1/4
3	P27303	1-13/32 ~ 1-7/8	8-1/4	10-5/16	10-1/2	13	1-1/2	2-11/16	1/4
4	P27404	1-29/32 ~ 2-9/16	9-1/8	11-1/16	11-1/4	13-3/4	1-1/2	2-11/16	1/4



EXTENDED LENGTH

Unit : Inch

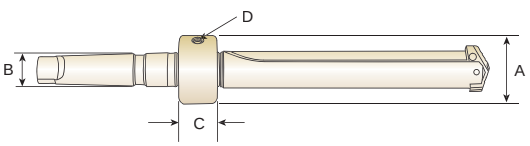
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Flute Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	P28Y01	3/8 ~ 27/64	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
Z	P28Z01	7/16 ~ 1/2	4-3/8	5-17/32	5-5/8	7-9/16	3/4	2-1/32	1/8
0	P28001	33/64 ~ 11/16	4-1/2	5-5/8	5-47/64	7-21/32	3/4	2-1/32	1/8
0.5	P28051	39/64 ~ 11/16	4-1/2	5-5/8	5-47/64	7-21/32	3/4	2-1/32	1/8
1	P28102	45/64 ~ 15/16	10-5/8	12-3/32	12-15/64	14-3/8	1	2-9/32	1/8
1.5	P28152	55/64 ~ 15/16	10-5/8	12-3/32	12-15/64	14-3/8	1	2-9/32	1/8
2	P28203	31/32 ~ 1-3/8	11-3/8	13-1/16	13-13/64	15-11/32	1-1/4	2-9/32	1/4
2.5	P28253	1-3/16 ~ 1-3/8	11-3/8	13-1/16	13-13/64	15-11/32	1-1/4	2-9/32	1/4

HOLDER ACCESSORIES

TORX SCREWS AND PREMIUM TORX HAND DRIVERS

Series	Torx Screws		Torx Screws (Nylon Locking)		Premium Torx Drivers	Drill Range		Torque in Lbs. 5.5
	Item	PKG EDP No. (10 Screws)	Item	PKG EDP No. (10 Screws)	EDP No.	Fractional inch	Metric mm	
Y	2XT7	J7Y001	2XT7N	J7Y006	J5Y007	3 / 8 – 27 / 64	9.5 – 11.0	5.5
Z	2LXT7	J7Z011	2LXT7N	J7Z016	J5Y007	7 / 16 – 1 / 2	11.5 – 12.5	5.5
0	2.5XT8	J80021	2.5XT8N	J80026	J50008	33 / 64 –11 / 16	13.0 – 17.5	11.0
0.5	2.5LXT8	J80531	2.5LXT8N	J80536	J50008	39 / 64 – 11 / 16	15.5 – 17.5	11.0
1	3XT9	J91041	3XT9N	J91046	J51009	45 / 64 – 15 / 16	18.0 – 24.0	20.0
1.5	3LXT9	J91551	3LXT9N	J91556	J51009	55 / 64 – 15 / 16	22.0 – 24.0	20.0
2	4XT15	JB2061	4XT15N	JB2066	J52015	31 / 32 – 1-3 / 8	25.0 – 35.0	45.0
2.5	4XT15	JB2061	4XT15N	JB2066	J52015	31 / 32 – 1-3 / 8	30.0 – 35.0	45.0
3-4	5XT20	JC3081	5XT20N	JC3086	J53020	1-13 / 32 – 2-9 / 16	36.0 – 65.0	90.0
5-8	6XT25	JD5091	6XT25N	JD5096	J55025	2-1 / 2 – 4-1 / 2	64.0 – 114.0	155.0

NOTE: Replacement screws sold in packages (10 screws per package)



ROTARY COOLANT INDUCER (RCI) AND ACCESSORIES

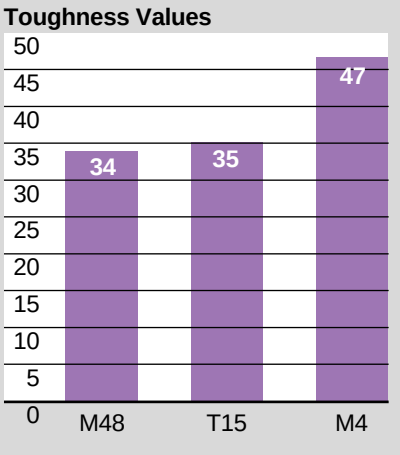
Complete with O'Rings, Flat Washers and Locking Clips.

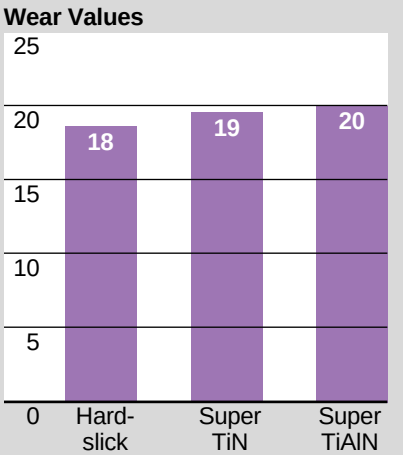
EDP No.	I.D. A	Pipe O.D. B	Length C	Tap D	Thread for Driving Rod
PR1030	3 / 4	1-3 / 4	7 / 8	1 / 8	5 / 16 – NC
PR1031	1	2-1 / 8	1-1 / 8	1 / 8	5 / 16 – NC
PR1042	1-1 / 4	2-1 / 2	1-3 / 8	1 / 4	3 / 8 – NC
PR1043	1-3 / 4	3	1-3 / 8	1 / 4	3 / 8 – NC
PR1054	2-1 / 4	3-3 / 4	1-3 / 4	1 / 2	1 / 2 – NC

SPADE DRILLS

RECOMMENDED CUTTING CONDITIONS

SPADE BLADE INSERTS SELECTION & APPLICATIONS HSS





- **WHEN TO USE M4**
  - Loose or Manual Machines
  - If T15 Breaks
- **WHEN TO USE T15**
  - When M4 Life needs to be Extended
  - If M48 Breaks
- **WHEN TO USE M48**
  - Extend Life T15
- **WHEN TO USE SM POINT**
  - Reduce Thrust
  - Smoother Entry
  - Improve Hole Quality
  - Higher Speeds and Feeds

SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT)

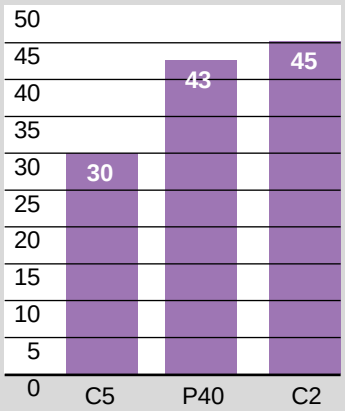
STANDARD GEOMETRY
SM POINT

Material	Material Hardness (BHN)	SFM Surface Footage		Feed (IPR)													
				3/8 ~ 1/2		33/64 ~ 11/16		45/64 ~ 15/16		31/32~ 1-3/8		1-13/32 ~ 1-7/8		1-29/32 ~ 2-9/16		2-19/32 ~ 4-1/2	
Free Machining Steel	100 - 150	280	330	.007	.008	.010	.012	.013	.016	.016	.019	.020	.020	.023	.023	.028	.028
1118, 1215, 12L14	150 - 200	260	305	.007	.007	.010	.011	.013	.015	.016	.017	.020	.020	.023	.023	.028	.028
	200 - 250	240	285	.007	.006	.010	.010	.013	.014	.016	.016	.020	.020	.023	.023	.028	.028
Low & Medium Carbon Steel		240	280	.006	.007	.009	.010	.012	.014	.015	.017	.019	.019	.023	.023	.027	.027
1018, 1040, 1140		225	265	.005	.006	.008	.009	.010	.013	.014	.016	.018	.018	.021	.021	.024	.024
		210	245	.005	.006	.008	.009	.010	.013	.014	.016	.018	.018	.021	.021	.024	.024
		195	230	.004	.005	.007	.008	.009	.012	.012	.015	.016	.016	.019	.019	.022	.022
Alloy Steel	125 - 175	210	245	.006	.007	.008	.010	.010	.014	.014	.017	.017	.017	.019	.019	.022	.022
4140, 5140, 8640	175 - 225	195	230	.005	.006	.008	.009	.010	.013	.014	.016	.017	.017	.019	.019	.022	.022
	225 - 275	180	215	.005	.006	.007	.009	.010	.013	.014	.016	.017	.017	.019	.019	.022	.022
	275 - 325	170	200	.004	.005	.006	.008	.009	.012	.012	.015	.015	.015	.017	.017	.020	.020
	325 - 375	155	185	.003	.004	.006	.007	.009	.011	.012	.014	.015	.015	.017	.017	.020	.020
High Strength Alloy Stee		110	130	.005	.006	.007	.009	.009	.011	.010	.013	.014	.014	.017	.017	.020	.020
4340, 4330V, 300M		85	105	.004	.005	.007	.008	.009	.010	.010	.012	.014	.014	.017	.017	.020	.020
		70	85	.003	.004	.006	.007	.008	.009	.009	.011	.012	.012	.015	.015	.018	.018
Structural Steel	100 - 150	200	240	.006	.008	.010	.011	.012	.015	.014	.017	.018	.018	.021	.021	.026	.026
A36, A285, A516	150 - 250	170	195	.005	.006	.009	.010	.010	.013	.012	.015	.016	.016	.019	.019	.024	.024
	250 - 350	140	165	.004	.005	.008	.009	.009	.012	.010	.013	.014	.014	.017	.017	.020	.020
High Temp, Alloy		40	50	.003	.004	.006	.007	.007	.009	.008	.011	.010	.012	.012	.015	.015	.017
Hastelloy B, Inconel 600		35	45	.003	.004	.006	.006	.007	.008	.008	.010	.010	.010	.012	.012	.015	.014
Stainless Steel	135 - 185	105	125	.006	.007	.008	.009	.009	.012	.011	.014	.014	.014	.016	.016	.020	.020
303, 416, 420, 17-4 PH	185 - 275	90	110	.005	.006	.007	.008	.008	.011	.010	.012	.012	.012	.014	.014	.018	.018
Tool Steel		110	130	.004	.004	.006	.007	.008	.010	.010	.012	.012	.012	.015	.015	.017	.017
H-13, H021, A04, 0-2, S-3		90	110	.004	.004	.006	.007	.008	.010	.010	.012	.012	.012	.015	.015	.017	.017
Aluminum	30	850	-	.008	-	.013	-	.016	-	.020	-	.022	.022	.025	.025	.025	.025
	180	450	-	.008	-	.013	-	.016	-	.018	-	.022	.022	.025	.025	.025	.025
Cast Iron		250	295	.007	.008	.012	.012	.016	.016	.020	.020	.024	.024	.027	.027	.030	.030
Gray, Ductile, Nodular		225	265	.006	.007	.011	.011	.014	.015	.018	.019	.022	.022	.025	.025	.028	.028
		195	230	.006	.006	.009	.009	.012	.013	.016	.017	.018	.018	.021	.021	.024	.024
		165	195	.005	.005	.007	.008	.009	.011	.012	.014	.014	.014	.017	.017	.020	.020
		135	160	.004	.005	.006	.007	.007	.010	.009	.011	.012	.012	.014	.014	.016	.016

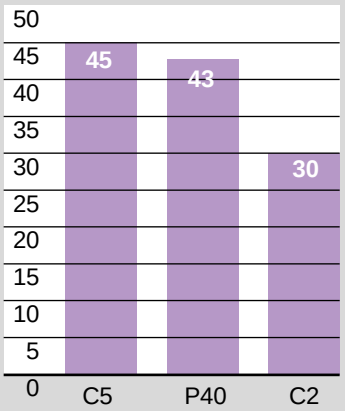
The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

SPADE BLADE INSERTS SELECTION & APPLICATIONS CARBIDE

Toughness Values



Wear Values



If C5 chips try C2 at 10% – 20% lower S.F.M. than C5 rating

Grade	Geometry and Application	Stocked Coatings
P40 & C5	Steel Cutting	Super TiN TiAIN
C3	Cast Iron	Super TiN TiAIN
P40 & C2	Ductile Iron Stainless Steel Aluminum Exotic Alloys	Super TiN TiAINE

Note: Carbide has a lower transverse rupture strength than HSS and is prone to chipping and breakage.

Recutting of chips or lack of rigidity can cause breakage.

Check Coolant Recommendations Chart on Page 461 for flow rates.

SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT)

STANDARD GEOMETRY
SM POINT

Material	Material Hardness (BHN)	SFM Surface Footage		Feed (IPR) 3/8 ~ 1/2		33/64 ~ 11/16		45/64 ~ 15/16		31/32 ~ 1-3/8		1-13/32 ~ 1-7/8	
Free Machining Steel 1118, 1215, 12L14	100 - 150	420	485	.006	.008	.009	.012	.012	.016	.015	.019	.019	-
	150 - 200	360	420	.006	.007	.008	.011	.011	.015	.013	.017	.017	-
	200 - 250	340	395	.005	.006	.008	.010	.010	.014	.012	.016	.015	-
Low & Medium Carbon Steel 1018, 1040, 1140	125 - 175	340	395	.005	.007	.008	.010	.010	.014	.014	.017	.017	-
	175 - 225	310	360	.005	.006	.007	.009	.008	.013	.012	.016	.016	-
	225 - 275	270	315	.004	.006	.007	.009	.008	.013	.012	.016	.015	-
	275 - 325	230	270	.004	.005	.006	.008	.006	.012	.010	.015	.014	-
Alloy Steel 4140, 5140, 8640	125 - 175	325	380	.005	.007	.008	.010	.010	.014	.013	.017	.016	-
	175 - 225	300	350	.005	.006	.007	.009	.009	.013	.012	.016	.015	-
	225 - 275	270	315	.004	.006	.007	.009	.009	.013	.012	.016	.015	-
	275 - 325	250	290	.004	.005	.006	.008	.008	.012	.011	.015	.014	-
	325 - 375	220	260	.003	.004	.005	.007	.008	.011	.010	.014	.013	-
High Strength Alloy Stee 4340, 4330V, 300M	225 - 300	200	235	.005	.006	.007	.009	.008	.011	.010	.013	.014	-
	300 - 350	180	210	.004	.005	.006	.008	.007	.010	.009	.012	.012	-
	350 - 400	160	190	.003	.004	.005	.007	.006	.009	.008	.011	.010	-
Structural Steel A36, A285, A516	100 - 150	310	360	.006	.008	.010	.011	.011	.015	.012	.017	.016	-
	150 - 250	250	290	.005	.006	.008	.010	.009	.013	.011	.015	.015	-
	250 - 350	230	270	.004	.005	.007	.009	.008	.012	.009	.013	.013	-
High Temp, Alloy Hastelloy B, Inconel 600	140 - 220	80	125	.003	.004	.006	.007	.007	.009	.009	.011	.011	-
	220 - 310	60	100	.003	.004	.005	.006	.006	.008	.008	.010	.010	-
Stainless Steel 303, 416, 420, 17-4 PH	135 - 185	210	245	.006	.007	.008	.009	.009	.012	.011	.014	.013	-
	185 - 275	160	190	.005	.006	.007	.008	.008	.011	.010	.012	.011	-
Tool Steel H-13, H021, A04, 0-2, S-3	150 - 200	220	260	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
	200 - 250	170	200	.003	.004	.005	.007	.007	.010	.009	.012	.011	-
Aluminum	30	1500	-	.008	-	.013	-	.016	-	.020	-	.022	-
	180	1000	-	.007	-	.011	-	.014	-	.018	-	.020	-
Cast Iron Gray, Ductile, Nodular	120 - 150	460	505	.006	.008	.009	.012	.011	.015	.015	.019	.020	-
	150 - 200	400	485	.005	.007	.008	.011	.010	.013	.014	.017	.018	-
	200 - 220	360	435	.005	.006	.007	.009	.008	.012	.012	.015	.015	-
	220 - 260	310	375	.004	.005	.006	.008	.007	.011	.010	.013	.013	-
	260 - 320	270	340	.004	.005	.005	.007	.006	.010	.008	.011	.011	-

The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

SUPER COBALT T15 FLAT BOTTOM

Material	Material Hardness (BHN)	Speed (SFM)		Feed			
		TiN	TiAlN	3/8 ~ 1/2	33/64 ~ 11/16	45/64 ~ 15/16	31/32 ~ 1-3/8
Free machining Steel 1213, 12L13, 1215 12L14, 1118	100 - 150	165	220	0.005	0.007	0.010	0.013
	150 - 200	150	215	0.005	0.007	0.010	0.013
	200 - 250	135	190	0.004	0.007	0.010	0.012
Low Carbon Steel 1015, 1020, 1140, 1025	85 - 125	140	195	0.005	0.007	0.009	0.012
	125 - 175	135	190	0.005	0.007	0.009	0.012
	175 - 225	125	180	0.004	0.006	0.008	0.011
	225 - 275	115	175	0.004	0.006	0.008	0.011
Medium Carbon Steel 1035, 1050, 1045 1055, 1140	125 - 175	135	195	0.004	0.007	0.009	0.011
	175 - 225	125	180	0.004	0.006	0.007	0.011
	225 - 275	115	165	0.004	0.006	0.007	0.011
	275 - 325	105	150	0.003	0.005	0.007	0.009
Structural Steel A36, A516, A182	100 - 150	115	165	0.004	0.007	0.009	0.011
	150 - 250	100	140	0.004	0.007	0.008	0.009
	250 - 350	80	115	0.003	0.006	0.007	0.008
Cast Iron / S,G Iron A48-76 GR30/GR45 A536-72 60-40-18 A220-76 GR40010	120 - 150	145	215	0.005	0.010	0.014	0.016
	150 - 200	130	190	0.005	0.008	0.011	0.016
	200 - 220	110	165	0.005	0.008	0.010	0.014
	220 - 260	95	150	0.004	0.006	0.008	0.010
	260 - 320	80	120	0.004	0.005	0.006	0.008
Alloy Steel 8620, 4130, 4137 4140, 6150	125 - 175	125	165	0.005	0.006	0.008	0.011
	175 - 225	115	150	0.004	0.006	0.008	0.011
	225 - 275	105	145	0.004	0.005	0.007	0.011
	275 - 325	100	140	0.003	0.005	0.007	0.009
	325 - 375	90	120	0.003	0.005	0.007	0.009
Tool Steel H13, H21, A2, S1	150 - 200	65	90	0.003	0.005	0.006	0.008
	200 - 250	45	75	0.003	0.005	0.006	0.008
High Temp. Alloy Hastelloy B,Inconel	140 - 220	20	30	0.003	0.005	0.006	0.008
	220 - 310	15	25	0.003	0.004	0.006	0.006
	225 - 300	65	90	0.004	0.006	0.007	0.008
High Strength Alloy 9840, 4340, 4330V	300 - 350	45	70	0.003	0.006	0.007	0.008
	350 - 400	40	60	0.003	0.005	0.006	0.007
Aluminium 2014, 6061, 7075	30	520	700	0.007	0.011	0.014	0.017
	180	255	390	0.007	0.011	0.014	0.016
Stainless Steel 310, 316, 410, 330	135 - 185	60	90	0.005	0.007	0.008	0.009
	185 - 275	50	80	0.004	0.006	0.007	0.009

RPM = revolution per minute (rev/min)
SFM = surface feet per minute (ft/min)
DIA = diameter of drill (inch)
IPR = feed rate (in/rev)
IPM = inch per minute penetration rate

*** Formulas :**

$$SFM = (RPM) \cdot (.262) \cdot (DIA.)$$

$$IPM = (RPM) \cdot (IPR)$$

$$RPM = \frac{(SFM) \cdot (3.82)}{(DIA.)}$$

The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

SPADE BLADE INSERTS HORSEPOWER CONSUMPTION RATE

Metal Removal Rates (MRR)
Example: 1.50 Dia. Drill @ 6.412 I.P.M.

Volume of Cylinder Method: D^2x.785xL
D = Hole Diameter
L = Length in I.P.M.
.785 is Constant

Material Drilled 4140 250 BHN:
Cutting Data: 180 S.F.M. (458 R.P.M.) x .014 Feed per Rev.

458 R.P.M. x .014 = 6.412 I.P.M. (L)

D^2 $(1.5)^2$ x .785 x L (6.412) = 11.3 C.U.In./ Min (MRR)

MRR of 11.3 x 1.4 Energy Value = 15.8HP.

metal removal rates (mrR)

- Cubic inches of metal removal per unit of horsepower.
- Unit horsepower (HP_u) is the amount of power to remove a volume of metal in a period of time.
  - HP_u = power to cut 1 cubic inch per minute – found in tables

Average Unit Horsepower Values of Energy Per Unit Volume

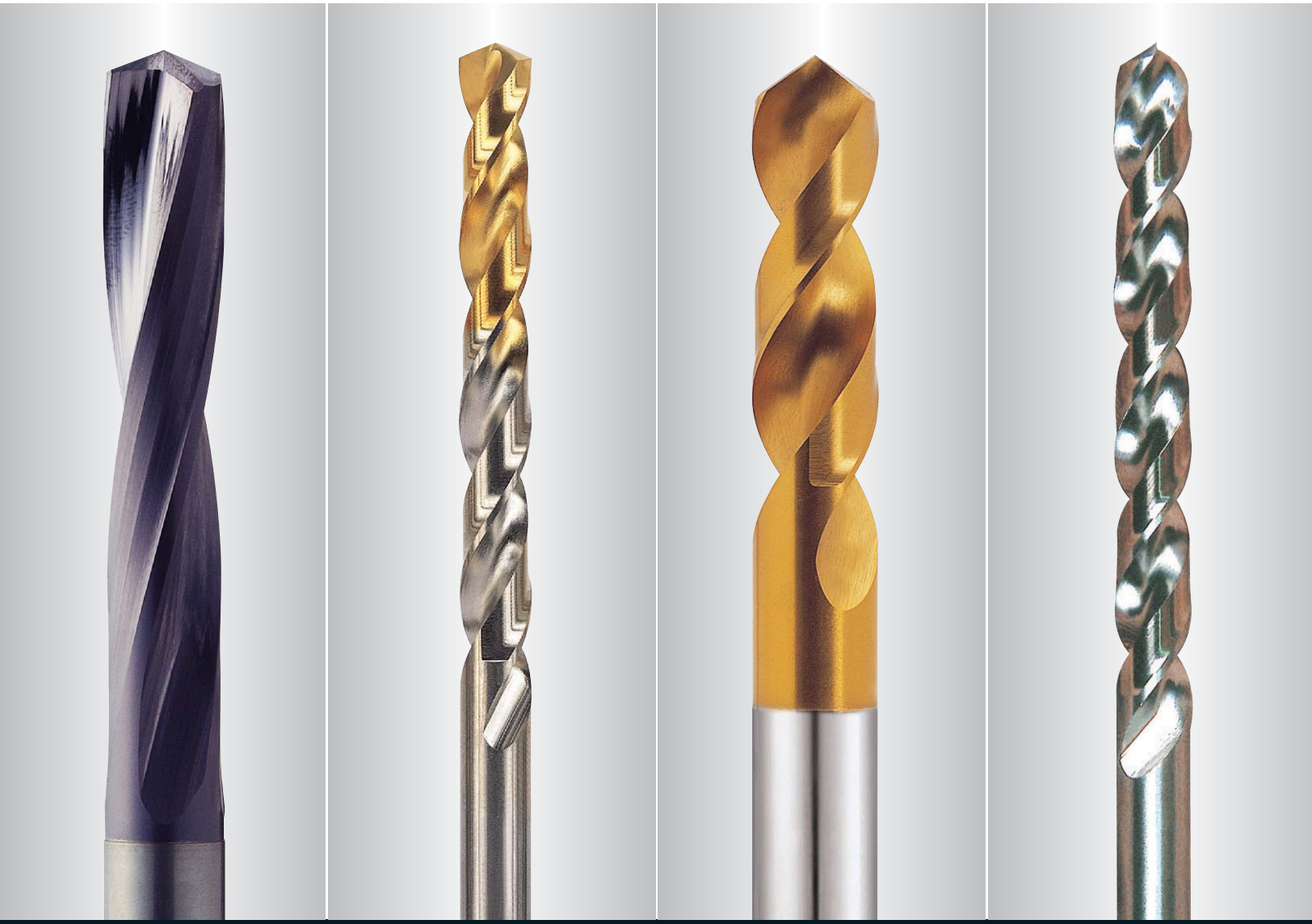
Material	BHN	HP_u (HP/(in^3/min.))
Carbon Steels	150-200 200-250 250-350	1.0 1.4 1.6
Leaded Steels	150-175	0.7
Cast Irons	125-190 190-250	0.5 1.6
Stainless Steels	135-275	1.5
Aluminum Alloys	50-100	0.3
Magnesium Alloys	40-90	0.2
Copper	125-140	0.7
Copper Alloys	100-150	0.7

COOLANT RECOMMENDATIONS (SPADE BLADE)

Material	Material Hardness (BHN)	Coolant Pressure (PSI) / Coolant Volumetric Flowrate (GPM)						
		3/8 ~ 1/2	33/64 ~ 11/16	23/32 ~ 1	1 ~ 1-1/4	1-1/4 ~ 2	2 ~ 3	3 ~ 4
Free Machining Steel 1118, 1215, 12L14, etc.	100 – 250	175-185 2.5-2.6	100-120 2.8-3.0	105-140 4.4-5.2	80-115 7-8	75-100 12-14	40-50 30-33	65-90 38-44
Low Carbon Steel 1010, 1020, 1025, 1522, etc.	85 – 275	165-170 2.4-2.5	75-90 2.4-2.6	75-95 3.7-4.2	60-80 6-7	55-75 11-12	30-40 26-30	50-65 33-38
Medium Carbon Steel 1030,1040,1050,1527,1140,1151,etc.	125 – 325	160-165 2.3-2.4	70-85 2.3-2.6	70-90 3.6-4.1	55-75 5-6	50-70 10-12	30-40 26-30	50-65 33-38
Alloy Steel 4140, 5140, 8640, etc.	125 – 375	160-165 2.3-2.4	66-75 2.2-2.4	65-80 3.5-3.9	50-70 5-6	45-60 10-11	30-35 26-28	40-50 30-33
High Strength Alloy 4340, 4330V, 300M, etc.	225 – 400	150-155 2.3-2.4	55-60 2.1-2.2	45-50 2.9-3.1	25-30 4-5	25-30 7-8	20-25 21-23	25-30 23-26
Structural Steel A36, A285, A516, etc.	100 – 350	160-165 2.3-2.4	75-85 2.4-2.6	65-80 3.5-3.9	40-55 5-6	40-50 9-10	25-30 23-26	40-50 30-33
High Temp. Alloy Hastelloy B, Inconel 600, etc.	140 – 310	150-155 2.3-2.4	60-65 2.2-2.3	50-55 3.1-3.2	30-35 4-5	25-30 7-8	25-30 23-26	- -
Stainless Steel 301, 316, 330, 17-4PH, etc.	135 – 275	165-170 2.4-2.5	70-85 2.3-2.6	65-75 3.5-3.7	40-55 5-6	40-50 9-10	25-30 23-26	35-45 28-31
Tool Steel H-13, H-21, A-4, 0-2, S-3, etc.	150 – 250	150-155 2.3-2.4	55-60 2.1-2.2	45-50 2.9-3.1	25-30 4-5	25-30 7-8	20-25 21-23	25-30 23-26
Aluminum	30 – 180	190-210 2.6-2.7	140-180 3.3-3.7	150-200 5.3-6.1	115-160 8-9	90-125 14-16	40-50 30-33	60-80 36-42
Cast Iron	120 – 320	155-160 2.3-2.4	60-65 2.2-2.3	50-60 3.1-3.3	30-40 4-5	30-35 8-9	25-30 23-26	30-35 26-28

DRILLS

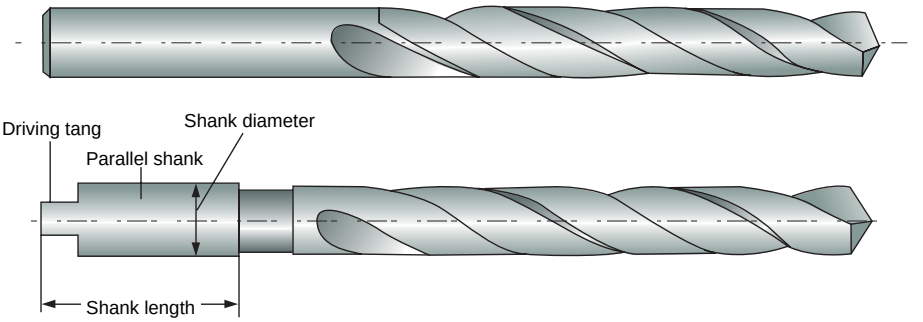
Being the best through innovation



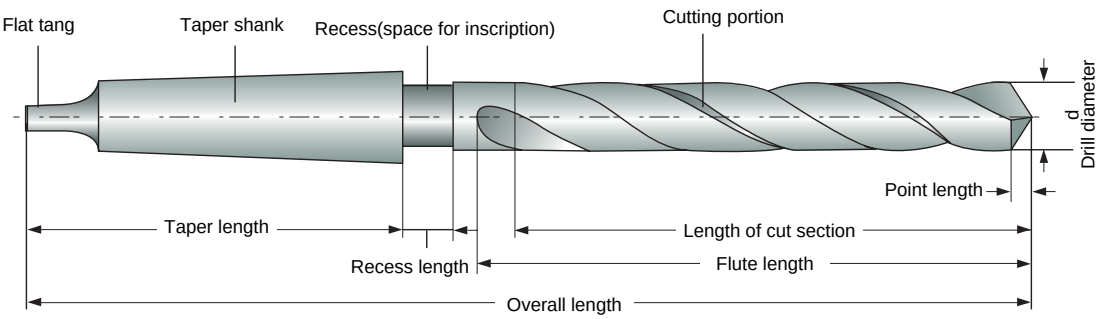
TECHNICAL DATA

TECHNICAL DATA

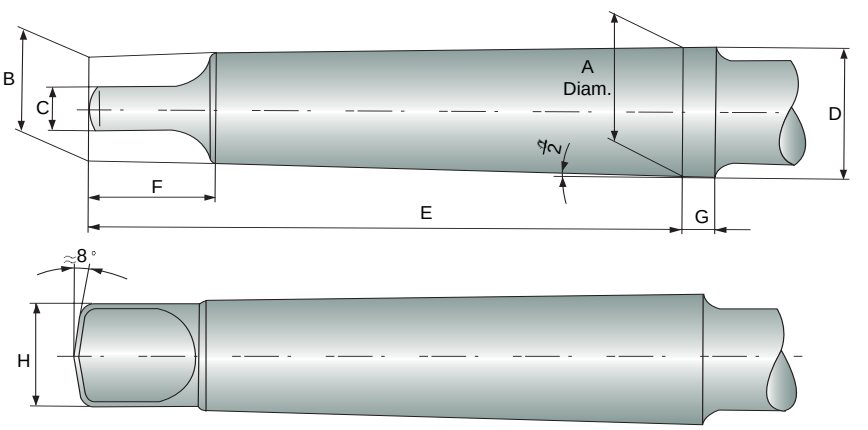
1 Twist Drill with parallel shank



2 Twist Drill with taper shank

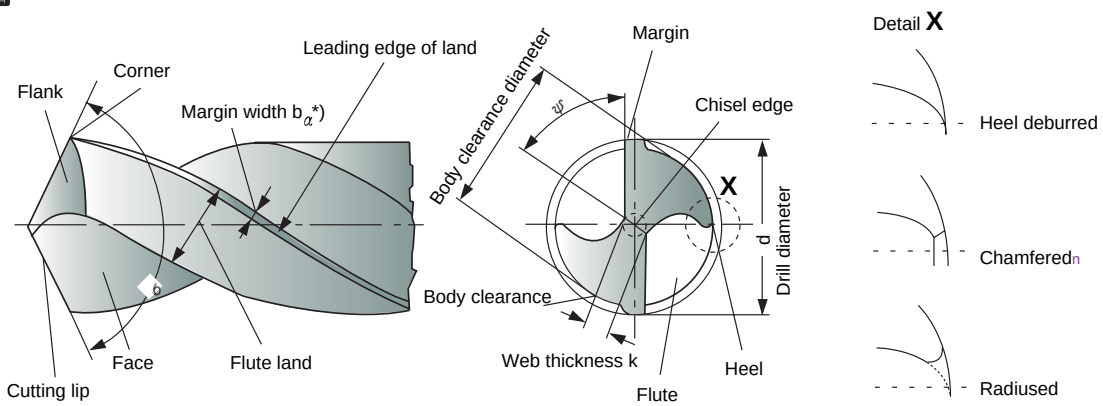


3 General dimensions of morse taper shanks



Morse Taper Shank	A mm	B mm	C(h13) mm	D mm	E mm	F(max.) mm	G mm	H(max.) mm	α/2
No.1	12.065	9	5.2	12.2	62	13.5	3.5	8.7	1°25′43″
No.2	17.780	14	6.3	18.0	75	16	5	13.5	1°25′50″
No.3	23.825	19.1	7.9	24.1	94	20	5	18.5	1°26′16″
No.4	31.267	25.2	11.9	31.6	117.5	24	6.5	24.5	1°29′15″
No.5	44.399	36.5	15.9	44.7	149.5	29	6.5	35.7	1°30′26″
No.6	63.348	52.4	19	63.8	210	40	8	51	1°29′36″

4 Cutting portion



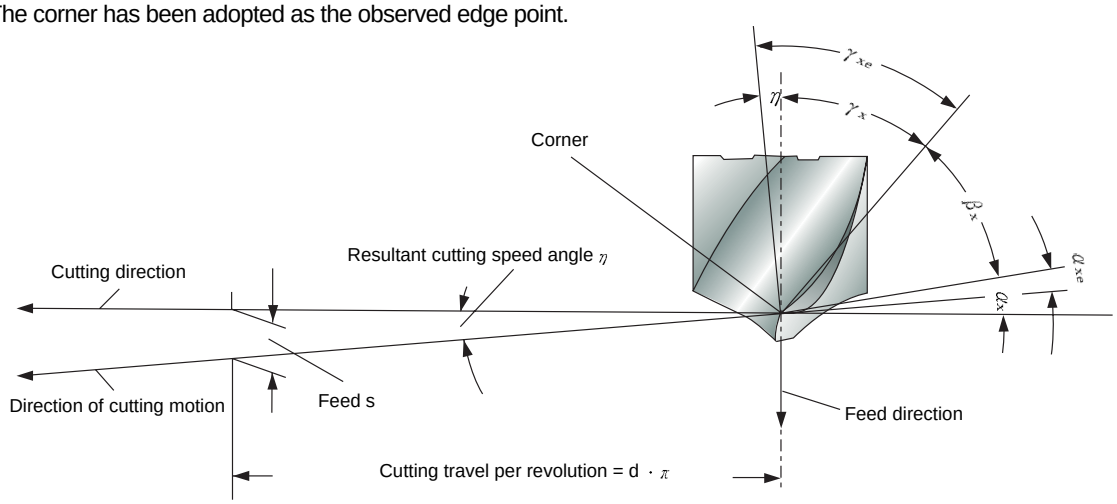
σ = Point angle (sigma)

ψ = Chisel edge angle (psi)

* In the context of cutting technology, land width b_α is the body clearance land width which is to be by $b_{f\alpha}$n, see DIN 6581.

5 Angle at the cutting edges

The corner has been adopted as the observed edge point.



α_x = Side clearance angle (alpha)

α_{xe} = Effective side clearance angle

β_x = Side wedge angle (beta)

γ_x = Front rake angle (gamma)

γ_{xe} = Working front rake angle

η = Resultant cutting speed angle (eta)

Clearance angle α, wedge angle β and rake angle γ are measured in the tool orthogonal plane. For details, see DIN 6581, definitions of metal-cutting technology; geometry at the tool edge.

Web thickness k

Test values : The web thickness according to Fig. 1 shall not be less than the minimum value k_{min} indicated in Fig. 2.
Test point : At the point of the drill.
Testing equipment : Slide gauge with measuring points.

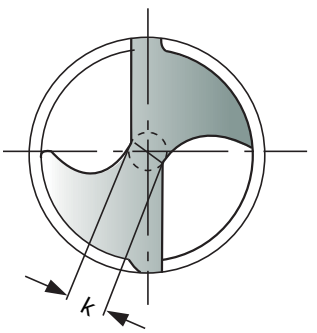


Figure 1. Web thickness k

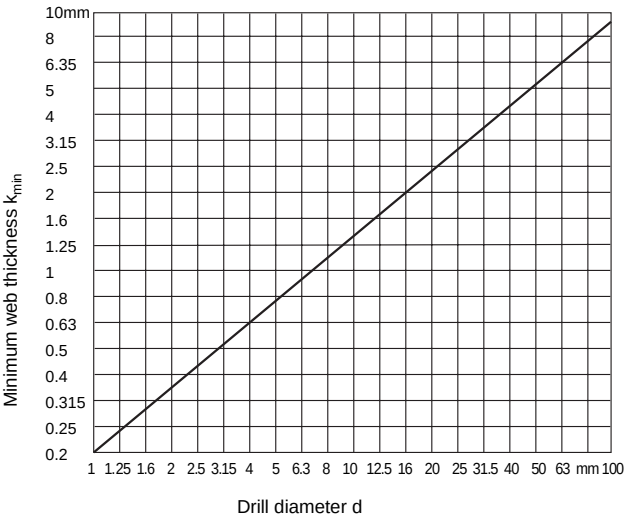


Figure 2. Web thickness k_{min}

Margin width b_α

Test values : The land width as in Fig. 3 shall lie within the limited values indicated in Fig. 4.
Test point : 5mm behind the corner
Testing equipment : Slide gauge

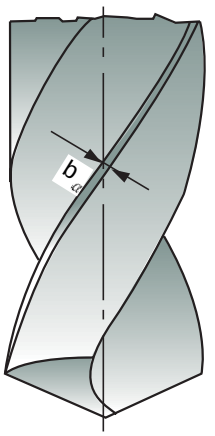


Figure 3. Margin width b_α

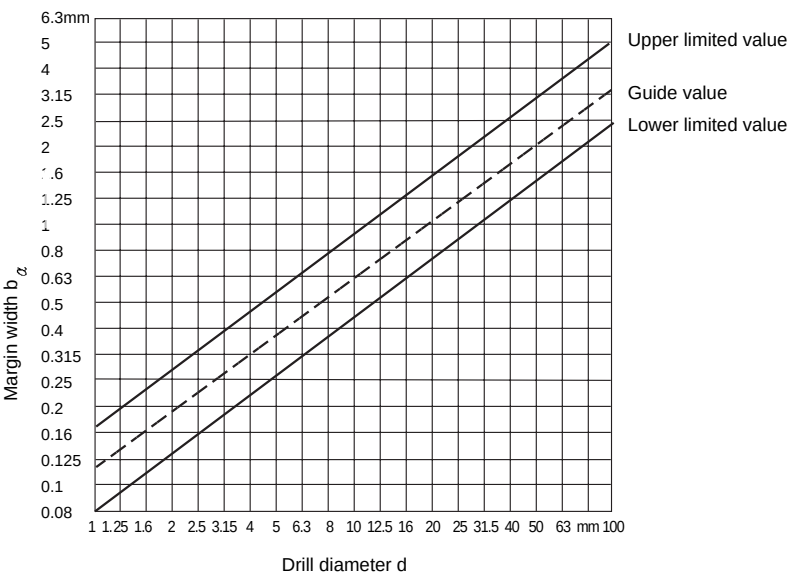


Figure 4. Margin width b_α

Angle on Twist Drills

(1) Side rake angle γ_f (Helix angle)

Recommended test value : Recommended ranges depending on the tool types N,H and W according to DIN 1836 and the diameter of the drill included in Fig. 5.

Test point : At the corner, see Fig. 6.

Testing equipment : According to VDI Guideline 3331 Part 1, Section Margin width b_α

Note : The side rake angle γ_f is measured in place of the orthogonal rake angle γ_O found in the wedge measuring plane (see DIN 6581), as this changes along the cutting edge (becoming smaller towards the point of the drill).

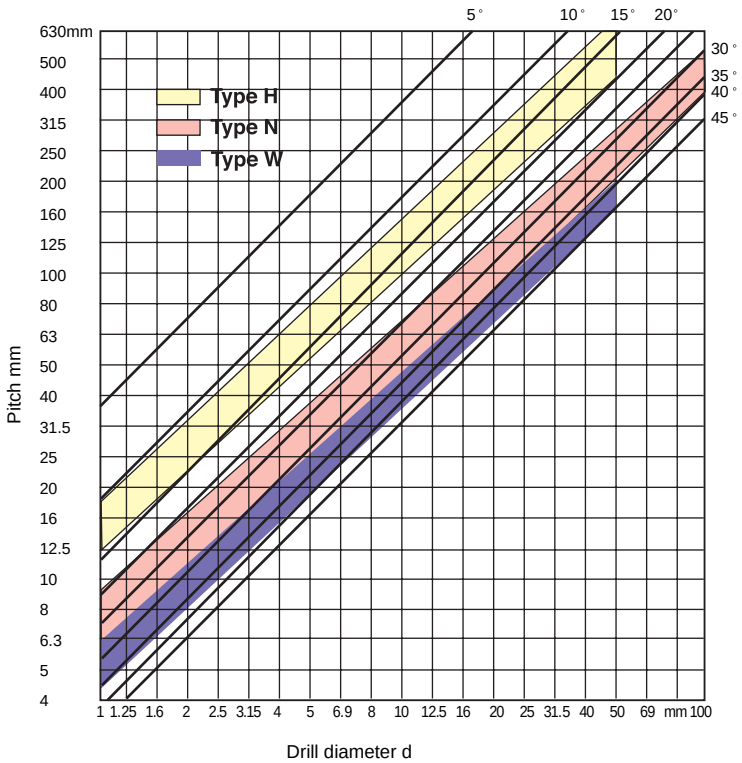


Figure 6. Side rake angle γ_f

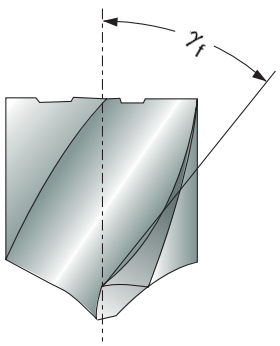


Figure 5. Side rake angle γ_f

(2) Point angle σ

Test value : Usual executin for tool types N and H : σ=118°, for tool type W : σ=130°

Test point : At the cutting, see Fig. 7.

Testing equipment : According to VDI Guideline 3331 Part 1, Section Margin width b_α.

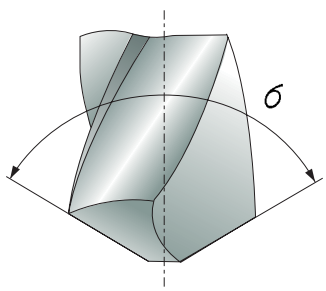


Figure 7. Point angle σ

9 Resharpening Twist Drills

(1) Drills are worn off irregularly. It should be sharpened prior to developing into excessive wear.

(2) Resharpening

① Grind the correct point angle to suit your application.(figure 8)
② Check that both cutting lips have the same angle. On a 130° point, each lip should be 65° toward the axis. The point must be on center, i.e., the chisel edge must produce cutting lips of equal length.(figure 8)
③ Grind Primary relief and Secondary clearance.(figure 9)
④ Grind web thinning. (figure 10)

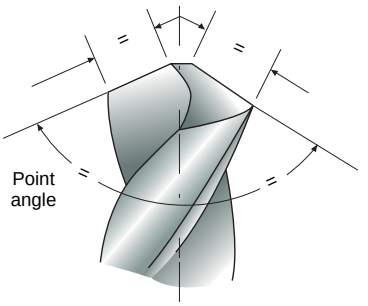


Figure 8

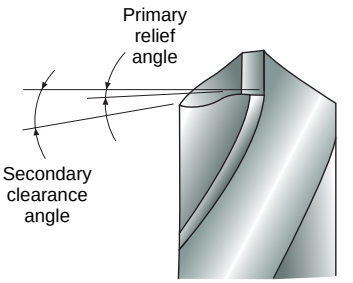


Figure 9

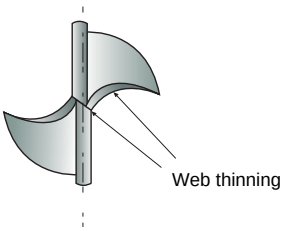
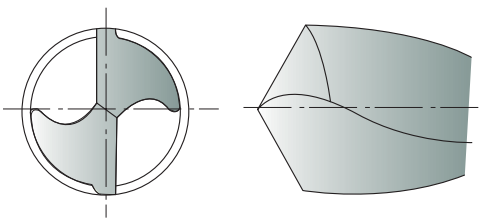


Figure 10

10 Web thinning

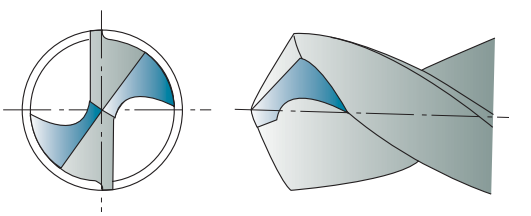
(1) Without thinning

Suitable for drill of general purpose.
Thanks to thin web thickness, web thinning is not needed.
This without web thinning type is applied to design of drills for mild steels, alloy steels, cast iron, stainless steels, titanium, inconel, etc. and conventional cutting conditons.



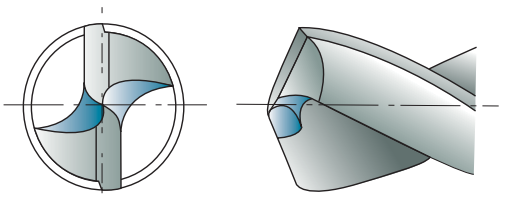
(2) Type C thinning (DIN1412 FORM C, SPLIT POINT)

Because Split point enables good centering when drilling and breaks the chips, chip removals are easy.
Suitable for drill design in high hardened tough materials, i.e, heat treated steels, titanium alloys, stainless steels, incoroy inconel, nimonic, etc.



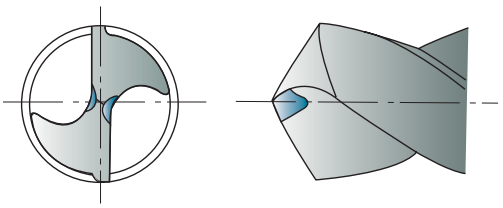
(3) Type R thinning (HELICAL THINNING)

Helical thinning ensures to frequent chip breaking and removal. The different direction force of cutting edges and helical thinning parts enable that chips curl, break and remove through the flutes. In addition, helical thinning makes the chip room up to center, remove the chisel and enables good centering



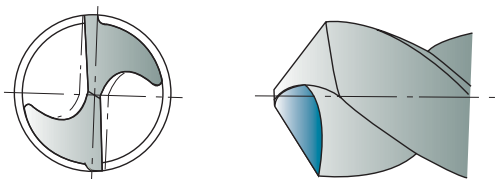
(4) Type A thinning (DIN1412 FORM A)

A type thinnings makes thin chisel, good chip removal and favorable centering.
This type is the easiest type to grind the thinning. In narrow web and wide fluted drills, keeping of the rigidity and smooth chip removal are possible.



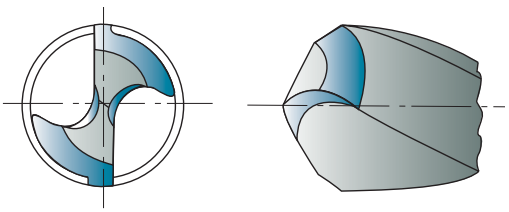
(5) Type B thinning (DIN1412 FORM B)

In case of work materials with low cutting resistance and good chip removal, i.e., cast iron, aluminum, plastic etc., B type thinning is suitable.
Especially when drills for high hardened steels are designed, this type is applied to decrease rake angle and avoid chipping of cutting lips.



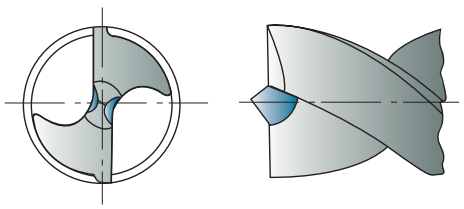
(6) Type D thinning (DIN1412 FORM D)

Grey cast iron thinning; bevelling of external edges strengthens the cutting edge.
Used for medium to high grey cast iron hardness and for abrasives.



(7) Type E thinning (DIN1412 FORM E)

Center drill bit thinning; ensures optimal center drilling and does not leave burs in through holes.
As the bit and cutting edges are delicate, this bit should be used for drilling thin sheet metal.



Surface Finishes for high speed steels Twist Drills

(1) Bright Finish

Drills with a bright finish are without surface treatment and ground condition.
Especially bright finished drills are used in machining of non ferrous materials.

(2) Coloring (Gold color)

The coloring is a thin oxide layer formed on the tool surfaces.
This is often applied to cobalt high speed steels twist drills.

(3) Steam Tempered (black oxide finish)

This is a black oxide layer 1-2㎛ formed on the tool surfaces.
Steam Tempered treated drill is the result of a steam tempering operation. Because the oxide layer retains some coolant on the tool surface, and aids chip flow, helps to dissipate heat, steam homo treated drills are recommended for ferrous applications.

12 Coating

The use of coated cutting tools reduce production costs.
For example

- Avoidance of machine downtime due to premature tool wear.
- Higher cutting capabilities to reduce actual machining times.
- Reproducible tool life.
- Improvement of component surface quality.

(1) TiN (Titanium Nitride) coating

Titanium Nitride gives the tool a higher performance in comparison to traditional non-coated drills.
TiN coating, with good all-around properties, is recommended for the general application, i.e., attack by abrasive, adhesive and chemical wear in equal proportions.

(2) TiCN (Titanium Carbon Nitride) coating

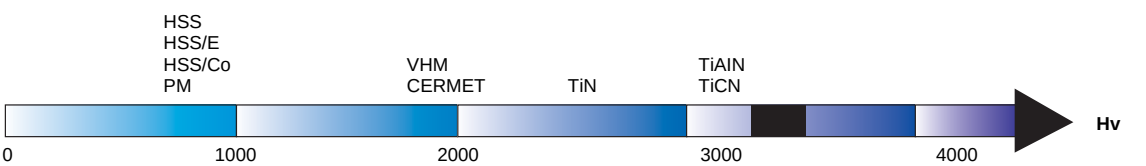
TiCN coating should be employed when severe thermodynamic stress is expected, for example when drilling in high hardened steels or in mild steels with high speed and feed.

(3) TiAlN (Titanium Alumium Nitride) coating

The addition of Aluminum to the Titanium Nitride produces an increase in hardness and an exceptional increase in resistance to oxidation at high temperature.
TiAlN coating is applied to drilling with severe thermal stress on cutting edges when continuous non-step feed, dry cutting or high speed cutting.

(4) Properties of coating

Properties	TiN	TiCN	TiAlN
Coating color	gold - yellow	blue - grey	violet - grey
Hardness (Hv 0.05)	2300	3000	3000
Coating thickness(㎛)	1 ~ 4	1 ~ 4	1 ~ 5
Max. working temperature (°C)	600	400	800
Coefficient of friction against steels(dry)	0.4	0.4	0.4



(5) Selection of coating

Work-material	HSS TWIST DRILLS	CARBIDE DRILLS
Unalloyed steels	TiCN, TiAlN	TiCN, TiAlN
Steels < 1000 N/mm²	TiCN, TiAlN	TiCN, TiAlN
Steels > 1000 N/mm²	TiCN, TiAlN	TiCN, TiAlN
Stainless steels	TiCN, TiAlN	TiCN, TiAlN
Cast iron	TiCN, TiAlN	TiAlN
Al-wrought alloys	TiN	TiN
Al-cast alloys	TiCN	TiCN
Copper (pure)	CrN	CrN
Brass	TiCN	TiCN
Bronze	TiCN	TiCN

Drill sizes before Tapping

(1) Metric - ISO threads coarse pitch

Nominal diameter	Drill diameter	Nominal diameter	Drill diameter	Nominal diameter	Drill diameter	Nominal diameter	Drill diameter
		M3	2.5	M11	9.5	M30	26.5
M1	0.75	M3.5	2.9	M12	10.2	M33	29.5
M1.2	0.95	M4	3.3	M14	12.0	M36	32.0
M1.4	1.1	M5	4.2	M16	14.0	M39	35.0
M1.6	1.25	M6	5.0	M18	15.5	M42	37.5
M1.8	1.45	M7	6.0	M20	17.5	M45	40.5
M2	1.6	M8	6.8	M22	19.5	M48	43.0
M2.2	1.75	M9	7.8	M24	21.0	M52	47.0
M2.5	2.05	M10	8.5	M27	24.0	M56	50.5

(2) Metric ISO threads fine pitch

Nominal diameter	Tap Pitch	Drill diameter	Nominal diameter	Tap Pitch	Drill diameter	Nominal diameter	Tap Pitch	Drill diameter
2.5	0.35	2.15	17	1.5	15.5	33	1.5	31.5
3	0.35	2.65	18	1	17	33	2	31
3.5	0.35	3.15	18	1.5	16.5	33	3	30
4	0.5	3.5	18	2	16	35	1.5	33.5
4.5	0.5	4	20	1	19	36	1.5	34.5
5	0.5	4.5	20	1.5	18.5	36	2	34
5.5	0.5	5	20	2	18	36	3	33
6	0.75	5.2	22	1	21	38	1.5	36.5
7	0.75	6.2	22	1.5	20.5	39	1.5	37.5
8	0.75	7.2	22	2	20	39	2	37
8	1	7	24	1	23	39	3	36
9	0.75	8.2	24	1.5	22.5	40	1.5	38.5
9	1	8	24	2	22	40	2	38
10	0.75	9.2	25	1	24	40	3	37
10	1	9	25	1.5	23.5	42	1.5	40.5
10	1.25	8.8	25	2	23	42	2	40
11	0.75	10.2	26	1.5	24.5	42	3	39
11	1	10	27	1	26	45	1.5	43.5
12	1	11	27	1.5	25.5	45	2	43
12	1.25	10.8	27	2	25	45	3	42
12	1.5	10.5	28	1	27	48	1.5	46.5
14	1	13	28	1.5	26.5	48	2	46
14	1.25	12.8	28	2	26	48	3	45
14	1.5	12.5	30	1	29	50	1.5	48.5
15	1	14	30	1.5	28.5	50	2	48
15	1.5	13.5	30	2	28	50	3	47
16	1	15	30	3	27	52	1.5	50.5
16	1.5	14.5	32	1.5	30.5	52	2	50
17	1	16	32	2	30	52	3	49

(3) WITHWORTH pipe threads (BSP)

Nominal size	Drill diameter	Nominal size	Drill diameter
inches	mm	inches	mm
G1 / 8	8.8	G1 ∗ 1 / 4	39.5
G1 / 4	11.8	G1 ∗ 3 / 8	42.0
G3 / 8	15.25	G1 ∗ 1 / 2	45.0
G1 / 2	19.0	G1 ∗ 3 / 4	51.0
G5 / 8	21.0	G2	57.0
G3 / 4	24.5	G2 ∗ 1 / 4	63.0
G7 / 8	28.25	G2 ∗ 1 / 2	73.0
G1	30.75	G2 ∗ 3 / 4	79.0
G11 / 8	35.5	G3	85.0

(4) American unified coarse threads

UNC	Drill diameter		UNC	Drill diameter	
	inches	mm		inches	mm
No. 1	53	1.51	**7 / 16**	U	9.35
No. 2	50	1.78	**1 / 2**	27 / 64	10.71
No. 3	47	1.99	**9 / 16**	31 / 64	12.30
No. 4	43	2.26	**5 / 8**	17 / 32	13.49
No. 5	38	2.58	**3 / 4**	21 / 32	16.67
No. 6	36	2.71	**7 / 8**	49 / 64	19.44
No. 8	29	3.45	**1**	7 / 8	22.22
No. 10	25	3.8	**1 ∗ 1 / 8**	63 / 64	25.00
No. 12	16	4.5	**1 ∗ 1 / 4**	1 ∗ 7 / 64	28.18
1 / 4	7	5.11	**1 ∗ 3 / 8**	1 ∗ 7 / 32	30.95
5 / 16	F	6.53	**1 ∗ 1 / 2**	1 ∗ 11 / 32	34.13
3 / 8	5 / 16	7.94			

(5) American unified fine threads

NF	Drill diameter		NF	Drill diameter	
	inches	mm		inches	mm
No. 0	3 / 64	1.19	**3 / 8**	Q	8.43
No. 1	53	1.51	**7 / 16**	25 / 64	9.92
No. 2	50	1.78	**1 / 2**	29 / 64	11.51
No. 3	45	2.08	**9 / 16**	33 / 64	13.10
No. 4	42	2.37	**5 / 8**	37 / 64	14.86
No. 5	37	2.64	**3 / 4**	11 / 16	17.46
No. 6	33	2.87	**7 / 8**	13 / 16	20.64
No. 8	29	3.45	**1**	59 / 64	23.42
No. 10	21	4.04	**1 ∗ 1 / 8**	1 ∗ 3 / 64	26.59
No. 12	14	4.62	**1 ∗ 1 / 4**	1 ∗ 11 / 32	29.76
1 / 4	3	5.41	**1 ∗ 3 / 8**	1 ∗ 19 / 32	32.94
5 / 16	1	6.91	**1 ∗ 1 / 2**	1 ∗ 27 / 64	36.11

ISO Tolerance

Drill Diameter Tolerance Inch

up to .118	over .118 up to .236	over .236 up to .394	over .394 up to .709
+0 -.00055	+0 -.00071	+0 -.00087	+0 -.00106

Drill Diameter Tolerance Metric

Diameter (mm)	1 - 3 from to	3 - 6 over to	6 - 10 over to	10 - 18 over to	18 - 30 over to
h6	0 –.00024	0 –.00032	0 –.00036	0 –.00044	0 –.00052
h7	0 –.0004	0 –.00048	0 –.00059	0 –.00071	0 –.00083
h8	0 –.00056	0 –.00071	0 –.00087	0 –.00107	0 –.00130
m7	+.00048 +.00007	+.00063 +.00015	+.00083 +.00023	+.00099 +.00027	+.00114 +.00031

Trouble Shooting in Drilling

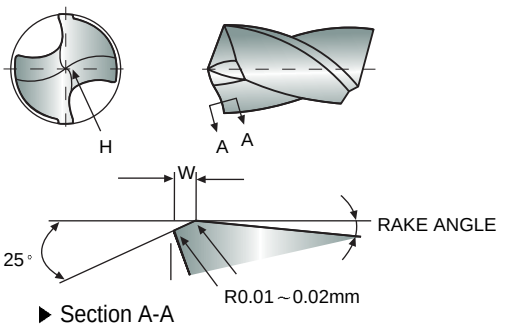
Occurrence of trouble	Cause of trouble	Countermeasures
Drill will not enter work	1. Drill is dull. 2. Lip relief too small. 3. Too thick a web.	1. Grind lip relief sufficiently. 2. Grind web thinning. 3. Choose a drill with narrow web.
Margin chipping	1.Oversized jig bushing.	1. Choose the suitable jig bushing for drill diameter
Cutting lip breaks	1. Lip relief too much. 2. Feed too heavy.	1. Grind lip relief sufficiently. 2. Decrease feed rate.
Tang breaks Bruch der	1. Imperfect fit between taper shank and socket. 2. Burred or Badly worn sockets.	1. Clean the dirt or chips in sockets. 2. Change the worn sockets to new ones.
Drill breaks in brass	1. Unsuitable drill 2. Flutes clogged with chips	1. Choose the suitable drill for work material.
Chipping of drill center	1. Lip relief too much. 2. Feed too heavy.	1. Grind lip relief sufficiently. 2. Decrease feed rate.
Hole oversize	1. Unequal angle or length of cutting edges. 2. Loosen spindle.	1. Resharpening point, choose correct drills. 2. Tighten spindle sufficiently.
Outer corners broken down	1. Cutting speed too high. 2. Hard spots in work material. 3. Flutes clogged with chips. 4. Too wear of drills.	1. Grind point to suit work material. 2. Decrease the feed rates. 3. Resharpening early beforce too wear.
Large chip of one flute and small chip of other flute	1. Improperly ground point. 2. Only one lip doing all the cutting	1. Properly grind point. 2. Grind point with same point angle and length of lip 3. Grind with small lip height.
Hole rough	1. Improperly ground point. 2. Unenough coolant supply 3. Too much feed. 4. Fixture not rigid.	1. Properly grind point. 2. Supply coolant enough. 3. Decrease the feed rate. 4. Tighten the fixture or replace.

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.
- 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

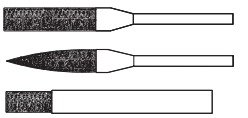
17 Honing Guide of DREAM DRILLS

■ **Dimension of Honing**



▶ Section A-A

■ **Scraper**



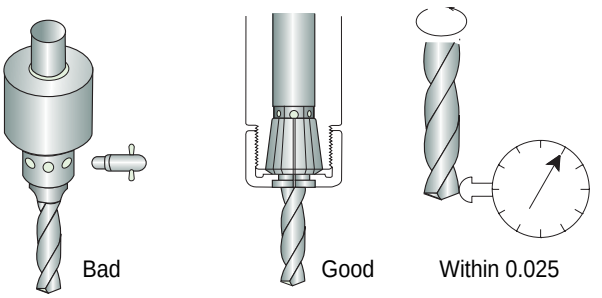
for Roughing (#140)

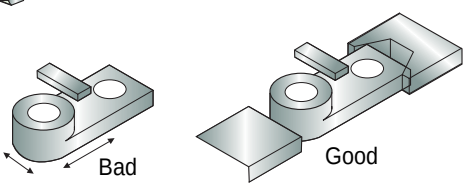
for Finishing (#230～#400)

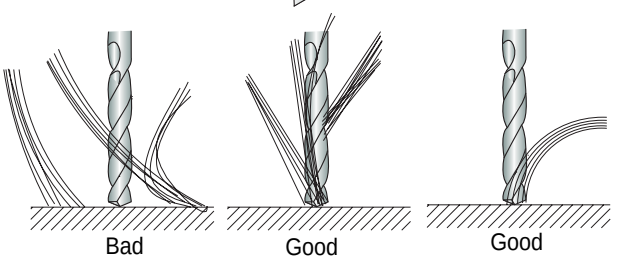
Work Material	Alloy Steels	Mild Steels	Cast Iron
W(mm)	0.15～0.2	0.1～0.15	0.03

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

18 Use of DREAM DRILLS







▶ Chucking with spring collet correctly.

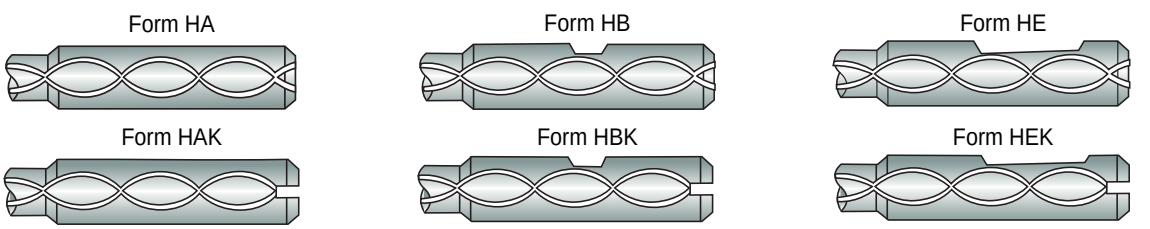
▶ Radial run out at cutting lip must not exceed 0.025 mm.

▶ Tighten clamp of work piece.

▶ Supply coolant enough to the entrance of hole.

▶ When using Dream Drills with Coolant holes, Supply high pressure coolant.

19 Shank Type DREAM DRILLS with Coolant Holes



▶ Shank Type of stocked products is Form HA.

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