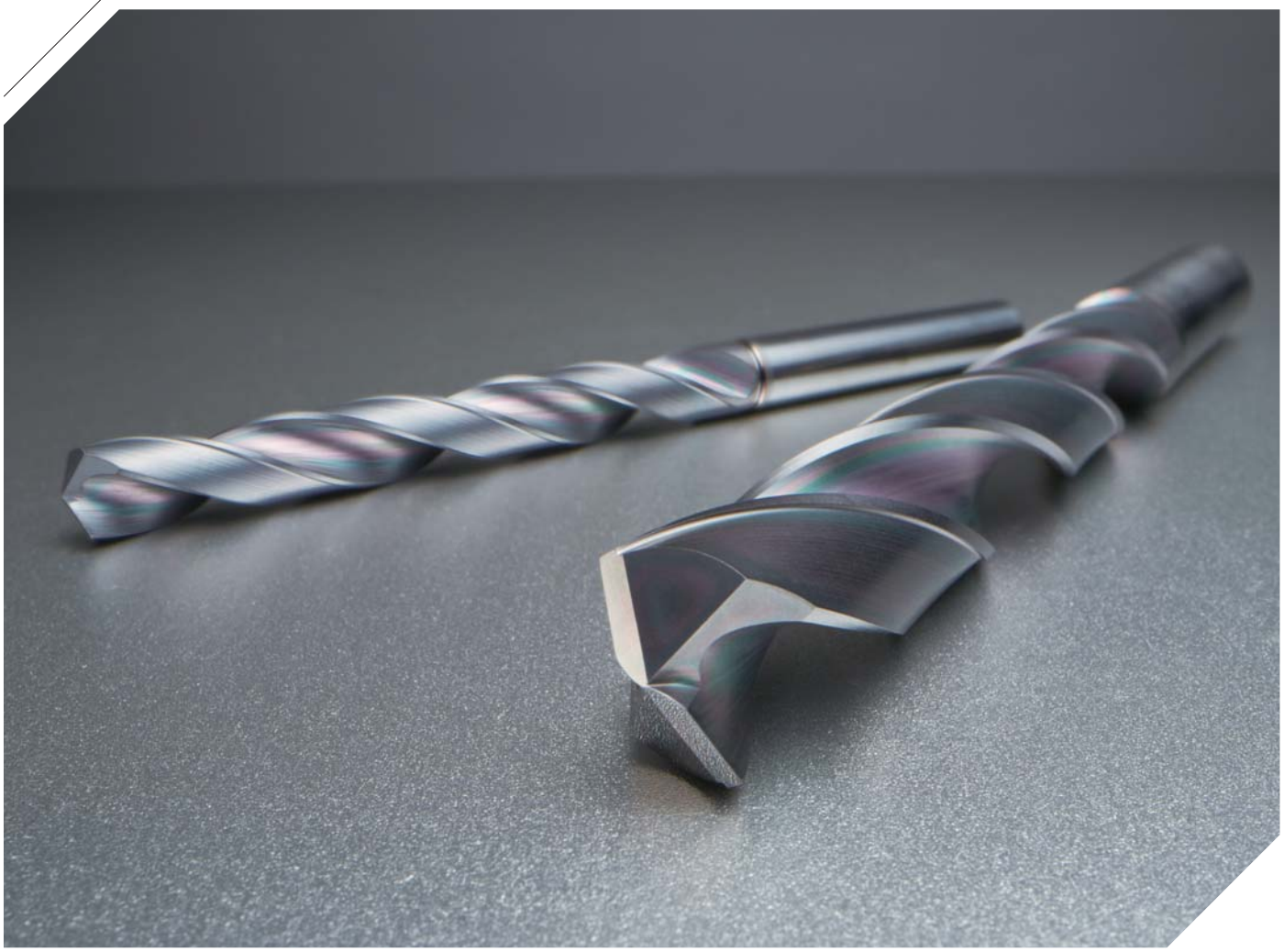
KORLOY
TECH-NEWS

W-Star Drill

Economical carbide coated solid drill

- Better cutting performance with an improved thinning shape which lessens cutting load
- High rigidity and good chip evacuation from the optimal designed flute



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Economical carbide coated solid drill

W-Star Drill

Drilling is applied to various industries in numerous ways. In addition, various workpieces including Carbon steel, Cast iron, Alloy steel, Stainless steel etc. are applied in drilling. Higher cutting performance and reduced machining time are required for efficient cutting.

W-Star Drill is designed for general use with enhanced stability and efficiency, and it has been designed for good chip control with reduced flute radius. Also the Drill's improved surface finish shows better chip evacuation.

The exclusive coating, PC320W based on AlCrN coating increases tool life by higher wear resistance and lubrication with higher welding resistance.

W-Star Drill is used for various types of cutting due to stable and excellent performance in wide cutting range, from low to high conditions.

» **Stable tool life**
- For automotive line, enhanced productivity

» **Various standard line-up**
- Provided customized service

» **Increased cutting performance, stable chip evacuation**
- Reduced cutting load on the cutting edge and better surface finish

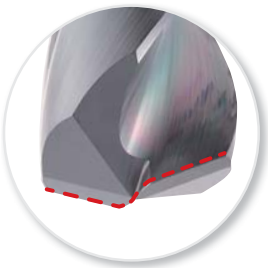
» **Applied to various workpieces**
- P, M, K

Code system

Special type

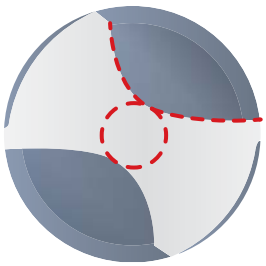
WSDP	040	-	5D	-	100L	-	5S
W-Star Drill Plus	Drill dia. 040 : Ø4.0 mm		Aspect ratio (L/D) 3D, 5D, 7D Special type Flute length 100 : 100 mm		Overall length 100L : 100 mm		Shank dia. 5S : Ø5 mm

Features



XR Thinning shape

- Reduced cutting load on the cutting edge with a streamlined thinning
- Improved chip breaking

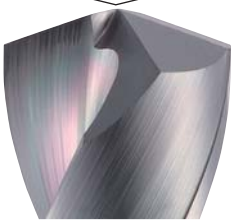


SECTION A-A'

Optimal flute

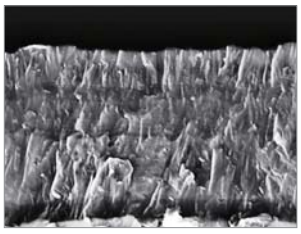
- Good chip evacuation due to applying the larger chip pocket

Multi point angle



Multi point angle

- Separated cutting load by optimal point angle
- Streamlined 1st point angle



New AlCrN coating

- Improved chip evacuation with enhanced flute lubrication
- Enhanced wear resistance and oxidation resistance by multi-layer coating

Application range

◎: 1st recommendation ○: 2nd recommendation

P					M	K
Carbon steel	Alloy steel	Pre-hardened steel	Heat-treated steel		Stainless steel	Cast iron
			STD61(~HRC55)	STD11(HRC55~63)		
◎	◎	○	-	-	◎	○

Recommended cutting conditions

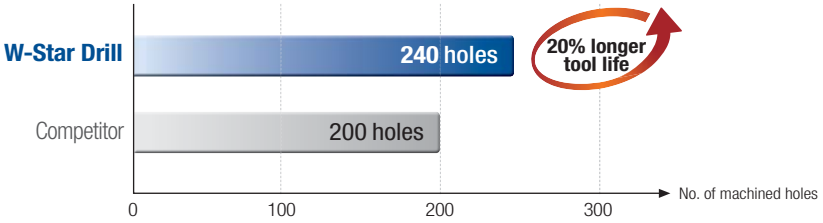
Workpiece			Hardness (HB)	Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)				
ISO	Workpiece material					∅2.5 ~ 4.0	∅4.1 ~ 8.0	∅8.1 ~ 12.0	∅12.1 ~ 16.0	∅16.1 ~ 20.0
P	Carbon steel	Low carbon steel	80 ~ 120	PC320W	72 (64 ~ 120)	0.08 ~ 0.12	0.13 ~ 0.19	0.16 ~ 0.24	0.20 ~ 0.29	0.24 ~ 0.32
		High carbon steel	Over 250	PC320W	40 (32 ~ 64)	0.06 ~ 0.16	0.06 ~ 0.16	0.08 ~ 0.20	0.12 ~ 0.20	0.12 ~ 0.24
	Alloy steel	Low alloy steel	140 ~ 260	PC320W	72 (64 ~ 120)	0.08 ~ 0.12	0.13 ~ 0.19	0.16 ~ 0.24	0.20 ~ 0.29	0.24 ~ 0.32
		Heat-treated low alloy steel	200 ~ 400	PC320W	48 (40 ~ 80)	0.08 ~ 0.12	0.13 ~ 0.19	0.16 ~ 0.24	0.20 ~ 0.29	0.24 ~ 0.32
		High alloy steel	50 ~ 260	PC320W	40 (32 ~ 64)	0.06 ~ 0.16	0.06 ~ 0.16	0.08 ~ 0.20	0.12 ~ 0.20	0.12 ~ 0.24
		Heat-treated high alloy steel	Over 250	PC320W	40 (32 ~ 64)	0.06 ~ 0.16	0.06 ~ 0.16	0.08 ~ 0.20	0.12 ~ 0.20	0.12 ~ 0.24
M	Stainless steel	Austenite series	135 ~ 275	PC320W	36 (20 ~ 64)	0.04 ~ 0.16	0.04 ~ 0.16	0.08 ~ 0.20	0.08 ~ 0.20	0.12 ~ 0.24
		Ferrite series Martensite series	135 ~ 275	PC320W	40 (24 ~ 64)	0.04 ~ 0.16	0.04 ~ 0.16	0.08 ~ 0.20	0.08 ~ 0.20	0.12 ~ 0.24
K	Cast iron	Gray cast iron	150 ~ 230	PC320W	80 (64 ~ 120)	0.08 ~ 0.12	0.13 ~ 0.19	0.16 ~ 0.24	0.20 ~ 0.29	0.24 ~ 0.32
		Ductile cast iron	160 ~ 260	PC320W	72 (56 ~ 112)	0.08 ~ 0.12	0.13 ~ 0.19	0.16 ~ 0.24	0.20 ~ 0.29	0.24 ~ 0.32

※ Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied.

Application examples

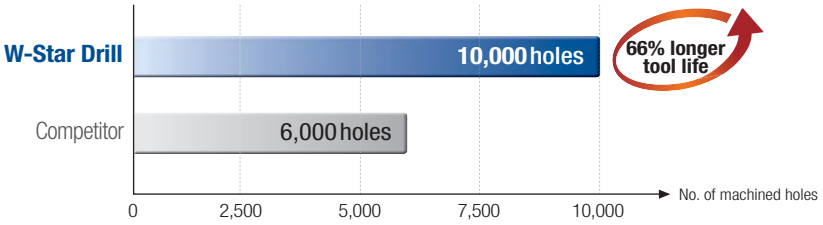
Automotive engine components

Workpiece	Heat-resisting stainless steel [1.4848(DIN)]
Cutting condition	vc (m/min) = 27.3, fn (mm/rev) = 0.13, ap (mm) = 15, wet
Tool	WSDP130-5D (PC320W)



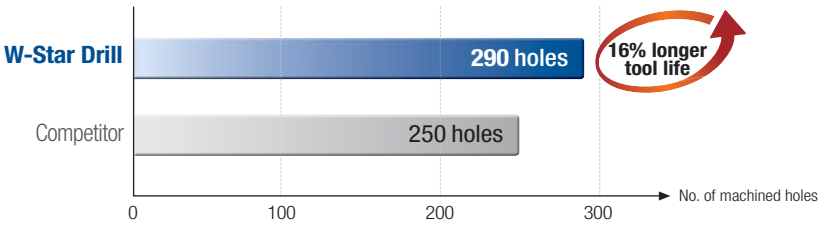
Bed plate

Workpiece	Ductile cast iron (400-18)
Cutting condition	vc (m/min) = 84, fn (mm/rev) = 0.15, ap (mm) = 26, wet
Tool	WSDP121-7D (PC320W)

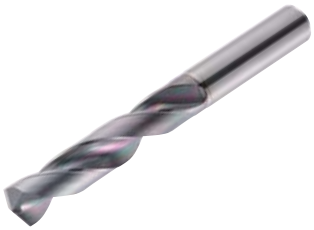


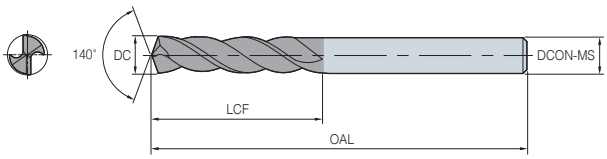
Automotive engine components

Workpiece	Ductile cast iron (HiSiMo)
Cutting condition	vc (m/min) = 57, fn (mm/rev) = 0.12, ap (mm) = 15, wet
Tool	WSDP114-5D (PC320W)



WSDP-□D





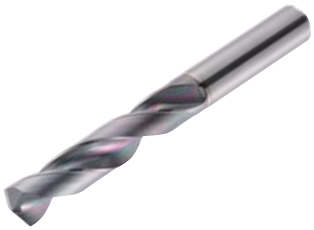
Specification	P	M	K
Grade	PC320W		
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle (SIG)	140°		
Twist angle	Streamlined		
Thinning	XR type		
Coolant	External system		

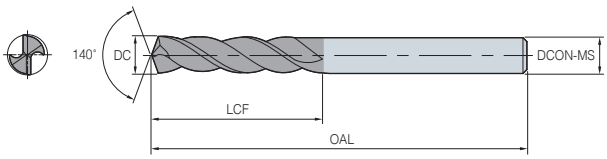
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	3D		5D		7D	
				LCF	OAL	LCF	OAL	LCF	OAL
WSDP	010 - □D	1	3	5	38	8	38	-	-
	011 - □D	1.1	3	6	42	9	42	-	-
	012 - □D	1.2	3	6	42	10	42	-	-
	013 - □D	1.3	3	6	42	10	42	-	-
	014 - □D	1.4	3	7	42	11	42	-	-
	015 - □D	1.5	3	7	42	11	42	-	-
	016 - □D	1.6	3	8	42	12	42	-	-
	017 - □D	1.7	3	8	42	12	42	-	-
	018 - □D	1.8	3	9	42	13	42	-	-
	019 - □D	1.9	3	9	42	13	42	-	-
	020 - □D	2	3	10	50	18	50	-	-
	021 - □D	2.1	3	10	50	18	50	-	-
	022 - □D	2.2	3	11	50	18	50	-	-
	023 - □D	2.3	3	11	50	18	50	-	-
	024 - □D	2.4	3	12	50	18	50	-	-
	025 - □D	2.5	3	12	50	18	50	-	-
	026 - □D	2.6	3	12	50	18	50	-	-
	027 - □D	2.7	3	14	50	18	50	-	-
	028 - □D	2.8	3	14	50	18	50	-	-
	029 - □D	2.9	3	14	50	18	50	-	-
	030 - □D	3	3	14	55	20	55	45	80
	031 - □D	3.1	4	16	55	20	55	45	80
	032 - □D	3.2	4	16	55	20	55	45	80
	033 - □D	3.3	4	16	55	20	55	45	80
	034 - □D	3.4	4	16	55	20	55	45	80
	035 - □D	3.5	4	16	55	20	55	45	80
	036 - □D	3.6	4	18	55	25	55	45	80
	037 - □D	3.7	4	18	55	25	55	45	80
	038 - □D	3.8	4	20	55	25	55	45	80
	039 - □D	3.9	4	20	55	25	55	45	80
	040 - □D	4	4	20	55	25	55	45	80
	041 - □D	4.1	5	20	55	25	55	45	80
	042 - □D	4.2	5	20	62	33	63	45	80
	043 - □D	4.3	5	22	62	33	63	45	80
	044 - □D	4.4	5	22	62	33	63	45	80
	045 - □D	4.5	5	22	62	33	63	45	80
	046 - □D	4.6	5	22	62	33	63	45	80
	047 - □D	4.7	5	22	62	33	63	45	80
	048 - □D	4.8	5	24	62	33	63	45	80
	049 - □D	4.9	5	24	62	33	63	45	80
	050 - □D	5	5	24	62	33	63	45	80
	051 - □D	5.1	6	24	62	33	63	45	80
	052 - □D	5.2	6	28	66	36	66	50	83
	053 - □D	5.3	6	28	66	36	66	50	83
	054 - □D	5.4	6	28	66	36	66	50	83
	055 - □D	5.5	6	28	66	36	66	50	83
	056 - □D	5.6	6	28	66	36	66	50	83
	057 - □D	5.7	6	28	66	36	66	50	83

WSDP-□D





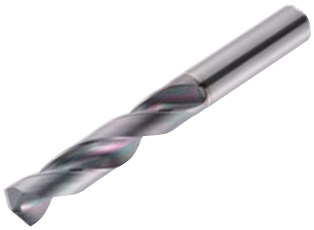
Specification	P	M	K
Grade	PC320W		
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle (SIG)	140°		
Twist angle	Streamlined		
Thinning	XR type		
Coolant	External system		

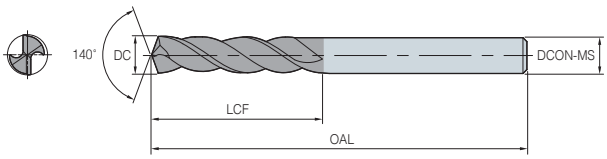
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	3D		5D		7D	
				LCF	OAL	LCF	OAL	LCF	OAL
WSDP	058 - □D	5.8	6	28	66	36	66	50	83
	059 - □D	5.9	6	28	66	36	66	50	83
	060 - □D	6	6	28	66	36	66	50	83
	061 - □D	6.1	7	30	66	36	66	50	83
	062 - □D	6.2	7	34	74	42	75	53	85
	063 - □D	6.3	7	34	74	42	75	53	85
	064 - □D	6.4	7	34	74	42	75	53	85
	065 - □D	6.5	7	34	74	42	75	53	85
	066 - □D	6.6	7	34	74	42	75	53	85
	067 - □D	6.7	7	37	74	42	75	53	85
	068 - □D	6.8	7	37	74	42	75	53	85
	069 - □D	6.9	7	37	74	42	75	53	85
	070 - □D	7	7	37	74	42	75	53	85
	071 - □D	7.1	8	37	74	42	75	53	85
	072 - □D	7.2	8	40	79	46	80	58	90
	073 - □D	7.3	8	40	79	46	80	58	90
	074 - □D	7.4	8	40	79	46	80	58	90
	075 - □D	7.5	8	40	79	46	80	58	90
	076 - □D	7.6	8	40	79	46	80	58	90
	077 - □D	7.7	8	40	79	46	80	58	90
	078 - □D	7.8	8	40	79	46	80	58	90
	079 - □D	7.9	8	40	79	46	80	58	90
	080 - □D	8	8	40	79	46	80	58	90
	081 - □D	8.1	9	40	79	46	80	58	90
	082 - □D	8.2	9	43	84	50	85	64	98
	083 - □D	8.3	9	43	84	50	85	64	98
	084 - □D	8.4	9	43	84	50	85	64	98
	085 - □D	8.5	9	43	84	50	85	64	98
	086 - □D	8.6	9	43	84	50	85	64	98
	087 - □D	8.7	9	43	84	50	85	64	98
	088 - □D	8.8	9	43	84	50	85	64	98
	089 - □D	8.9	9	43	84	50	85	64	98
	090 - □D	9	9	43	84	50	85	64	98
	091 - □D	9.1	10	43	84	50	85	64	98
	092 - □D	9.2	10	47	89	55	90	68	105
	093 - □D	9.3	10	47	89	55	90	68	105
	094 - □D	9.4	10	47	89	55	90	68	105
	095 - □D	9.5	10	47	89	55	90	68	105
	096 - □D	9.6	10	47	89	55	90	68	105
	097 - □D	9.7	10	47	89	55	90	68	105
	098 - □D	9.8	10	47	89	55	90	68	105
	099 - □D	9.9	10	47	89	55	90	68	105
	100 - □D	10	10	47	89	55	90	68	105
	101 - □D	10.1	11	47	89	55	90	68	105
	102 - □D	10.2	11	51	95	57	95	73	110
	103 - □D	10.3	11	51	95	57	95	73	110
	104 - □D	10.4	11	51	95	57	95	73	110
	105 - □D	10.5	11	51	95	57	95	73	110

WSDP-□D





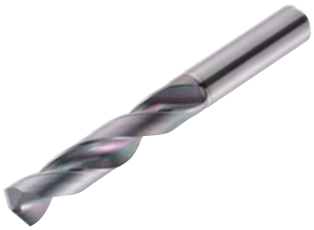
Specification	P	M	K
Grade	PC320W		
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle (SIG)	140°		
Twist angle	Streamlined		
Thinning	XR type		
Coolant	External system		

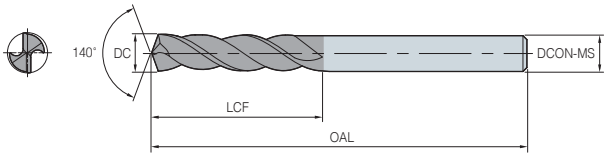
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	3D		5D		7D	
				LCF	OAL	LCF	OAL	LCF	OAL
WSDP	106 - □D	10.6	11	51	95	57	95	73	110
	107 - □D	10.7	11	51	95	57	95	73	110
	108 - □D	10.8	11	51	95	57	95	73	110
	109 - □D	10.9	11	51	95	57	95	73	110
	110 - □D	11	11	51	95	57	95	73	110
	111 - □D	11.1	12	51	95	57	95	73	110
	112 - □D	11.2	12	54	102	63	102	80	120
	113 - □D	11.3	12	54	102	63	102	80	120
	114 - □D	11.4	12	54	102	63	102	80	120
	115 - □D	11.5	12	54	102	63	102	80	120
	116 - □D	11.6	12	54	102	63	102	80	120
	117 - □D	11.7	12	54	102	63	102	80	120
	118 - □D	11.8	12	54	102	63	102	80	120
	119 - □D	11.9	12	54	102	63	102	80	120
	120 - □D	12	12	54	102	63	102	80	120
	121 - □D	12.1	13	54	102	63	102	80	120
	122 - □D	12.2	13	57	102	63	102	90	137
	123 - □D	12.3	13	57	102	63	102	90	137
	124 - □D	12.4	13	57	102	63	102	90	137
	125 - □D	12.5	13	57	102	63	102	90	137
	126 - □D	12.6	13	57	102	63	102	90	137
	127 - □D	12.7	13	57	102	63	102	90	137
	128 - □D	12.8	13	57	102	63	102	90	137
	129 - □D	12.9	13	57	102	63	102	90	137
	130 - □D	13	13	57	102	63	102	90	137
	131 - □D	13.1	14	-	-	63	102	90	137
	132 - □D	13.2	14	-	-	65	107	96	147
	133 - □D	13.3	14	-	-	65	107	96	147
	134 - □D	13.4	14	-	-	65	107	96	147
	135 - □D	13.5	14	-	-	65	107	96	147
	136 - □D	13.6	14	-	-	65	107	96	147
	137 - □D	13.7	14	-	-	65	107	96	147
	138 - □D	13.8	14	-	-	65	107	96	147
	139 - □D	13.9	14	-	-	65	107	96	147
	140 - □D	14	14	-	-	65	107	96	147
	141 - □D	14.1	15	-	-	65	107	96	147
	142 - □D	14.2	15	-	-	67	111	100	153
	143 - □D	14.3	15	-	-	67	111	100	153
	144 - □D	14.4	15	-	-	67	111	100	153
	145 - □D	14.5	15	-	-	67	111	100	153
	146 - □D	14.6	15	-	-	67	111	100	153
	147 - □D	14.7	15	-	-	67	111	100	153
	148 - □D	14.8	15	-	-	67	111	100	153
	149 - □D	14.9	15	-	-	67	111	100	153
	150 - □D	15	15	-	-	67	111	100	153
	151 - □D	15.1	16	-	-	67	111	100	153
	152 - □D	15.2	16	-	-	69	115	112	160

WSDP-□D





Specification	P	M	K
Grade	PC320W		
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle (SIG)	140°		
Twist angle	Streamlined		
Thinning	XR type		
Coolant	External system		

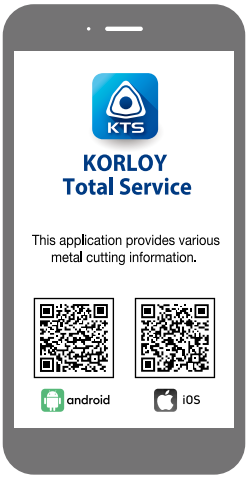
P Steel M Stainless steel K Cast iron

(mm)

Designation		DC	DCON-MS	3D		5D		7D	
				LCF	OAL	LCF	OAL	LCF	OAL
WSDP	154 - □D	15.4	16	-	-	69	115	112	160
	155 - □D	15.5	16	-	-	69	115	112	160
	156 - □D	15.6	16	-	-	69	115	112	160
	157 - □D	15.7	16	-	-	69	115	112	160
	158 - □D	15.8	16	-	-	69	115	112	160
	160 - □D	16	16	-	-	69	115	112	160
	161 - □D	16.1	17	-	-	69	115	112	160
	163 - □D	16.3	17	-	-	71	119	112	160
	165 - □D	16.5	17	-	-	71	119	112	160
	170 - □D	17	17	-	-	71	119	112	160
	171 - □D	17.1	18	-	-	71	119	112	160
	172 - □D	17.2	18	-	-	74	123	112	160
	175 - □D	17.5	18	-	-	74	123	112	160
	177 - □D	17.7	18	-	-	74	123	112	160
	178 - □D	17.8	18	-	-	74	123	112	160
	180 - □D	18	18	-	-	74	123	112	160
	181 - □D	18.1	19	-	-	74	123	112	160
	182 - □D	18.2	19	-	-	76	127	112	160
	185 - □D	18.5	19	-	-	76	127	112	160
	190 - □D	19	19	-	-	76	127	112	160
	191 - □D	19.1	20	-	-	76	127	112	160
	195 - □D	19.5	20	-	-	80	131	112	160
	197 - □D	19.7	20	-	-	80	131	112	160
	200 - □D	20	20	-	-	80	131	112	160

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasses or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.
- Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.
- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.



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