WSDP, WSDPH (Oil hole type)
General carbide coated Solid Drill

W-Star Drill series

KORLOY
TECH-NEWS

- New tip groove geometry prevents chip clogging and maximizes cooling efficiency
- Improved XR thinning structure disperses cutting force, resulting in excellent tool life

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General carbide coated Solid Drill

W-Star Drill series

Drilling is used in numerous ways in various industries seeking better efficiency. Industries require improved cutting performance and reduced machining time for various workpieces, including Carbon steel, Cast iron, Alloy steel, Stainless steel, etc.

W-Star Drill (WSDP) is designed for general use with enhanced stability and efficiency, and it is designed with reduced flute radius for a good chip control. Also, the drill has been improved to produce an optimal surface finish, resulting in better chip evacuation.

W-Star Drill (WSDPH) minimizes chip clogging with its pocket design optimized for drilling depth. A newly designed tip groove geometry increases coolant flow rate and velocity, effectively controlling cutting heat. The improved XR thinning structure ensures smooth chip evacuation and evenly distributes cutting forces to prevent localized stress, which extends tool life. The drill also complies with DIN standard specifications.

The exclusive AlCrN based coating PC320W 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.

Minimized Chip Packing

- Prevents chip blocking in deep drilling and reduces internal hole damage

Smooth chip evacuation & reduced Cutting load

- Excellent chip evacuation efficiency and tool life achieved with XR thinning

Enhanced Cooling Efficiency

- Improved coolant flow and reduced cutting edge temperature through a new tip groove

Versatile Workpiece Compatibility

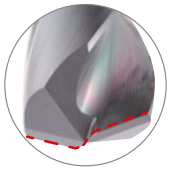
- Stable machining across a wide range of materials and conditions thanks to its universal design

WSDP - Code system

Special type

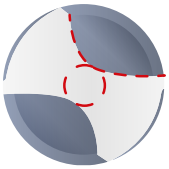
WSDP	040	-	5D	100L	-	5S
W-Star Drill Plus	**Drill diameter (DC)** 040 = Ø4.0mm		**Aspect ratio (L/D)** 3D, 5D, 7D **Special type** Flute length 100 : 100 mm	**Overall length** 100L: 100mm		**Shank diameter** 5S: Ø5.0mm

Features



XR Thinning shape

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

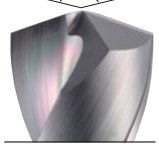


Section A-A'

Optimal flute

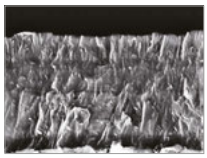
- Good chip evacuation due to applying the larger chip pocket

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

WSDP - 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)		
◎	◎	○	–	–	◎	○

WSDP - Recommended cutting conditions

Workpiece	P						M		K			
	Carbon Steels, Alloy Steels SS400, SM50C, SCM, SCr ~900N/mm² / ~HRC 28		Alloy Steel SCM, SCr -1,100N/mm² HRC 28-35		Alloy Steel Hardened Steels -HRC40		Acier inoxydable SUS300, SUS400		Cast iron -350N/mm²		Ductile Iron 400-600N/mm²	
cutting conditions	70-120 m/min		50-90 m/min		25-60 m/min		35-70 m/min		70-120 m/min		55-100 m/min	
DC (Ø)	RPM n (min⁻¹)	fn (mm/rev)	RPM n (min⁻¹)	fn (mm/rev)	RPM n (min⁻¹)	fn (mm/rev)	RPM n (min⁻¹)	fn (mm/rev)	RPM n (min⁻¹)	fn (mm/rev)	RPM n (min⁻¹)	fn (mm/rev)
2	11,100	0.06	8,000	0.06	4,000	0.06	8,400	0.06	11,100	0.06	10,400	0.06
4	7,600	0.14	5,600	0.14	3,400	0.1	4,200	0.14	7,600	0.14	6,200	0.14
6	5,000	0.17	3,700	0.17	2,300	0.14	2,800	0.17	5,000	0.17	4,100	0.21
8	3,800	0.21	2,800	0.21	1,700	0.18	2,100	0.21	3,800	0.21	3,100	0.24
10	3,000	0.25	2,200	0.25	1,400	0.22	1,700	0.25	3,000	0.25	2,500	0.26
12	2,500	0.27	1,900	0.27	1,100	0.24	1,400	0.27	2,500	0.27	2,100	0.28
14	2,200	0.29	1,600	0.29	1,000	0.26	1,200	0.29	2,200	0.29	1,800	0.31
16	1,900	0.31	1,400	0.31	800	0.29	1,000	0.31	1,900	0.31	1,500	0.33
18	1,700	0.33	1,200	0.33	800	0.32	900	0.33	1,700	0.33	1,400	0.35
20	1,500	0.35	1,100	0.35	700	0.34	800	0.35	1,500	0.35	1,200	0.37

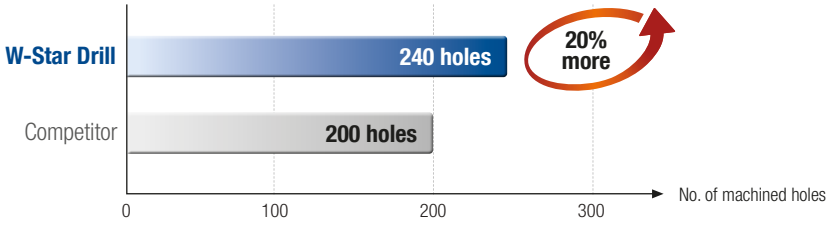
※ In actual machinning, the condition should be adjusted according to the machining shape, purpose and machine type.

* **7D** : apply 75 % of above cutting condition.

Application Examples

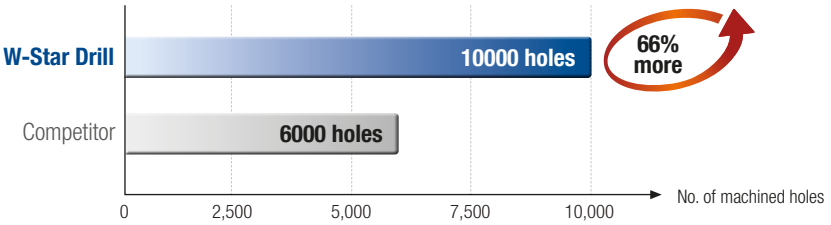
Automotive engine components

Workpiece	Heat-resisting stainless steel 1.4848 (DIN)
Cutting conditions	vc = 27,3 m/min · fn = 0,13 mm/rev · ap = 15 mm · wet
Tools	**Insert** WSDP130-5D (PC320W)



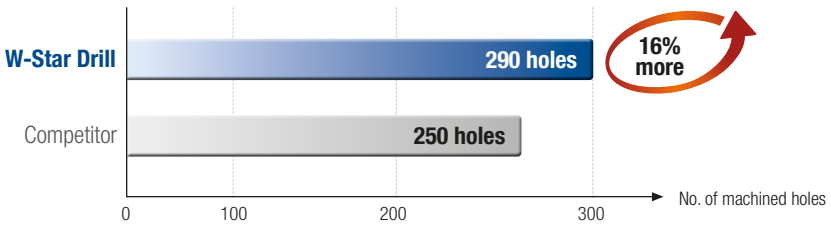
Bed plate

Workpiece	Ductile cast iron 400-18
Cutting conditions	vc = 84,0 m/min · fn = 0,15 mm/rev · ap = 26 mm · wet
Tools	**Insert** WSDP121-7D (PC320W)

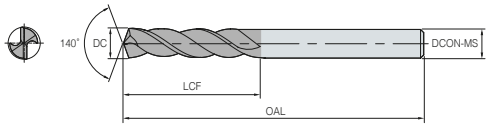


Automotive engine components

Workpiece	Ductile cast iron (HiSiMo)
Cutting conditions	vc = 57,0 m/min · fn = 0,12 mm/rev · ap = 15 mm · wet
Tools	**Insert** WSDP114-5D (PC320W)



WSDP- X D



DC		DCON-MS
D1 - D3	0 - -0.010 mm	h6
D3.1 - D6	0 - -0.012 mm	
D6.1 - D10	0 - -0.015 mm	
D10.1 - D18	0 - -0.018 mm	
D18.1 -	0 - -0.021 mm	

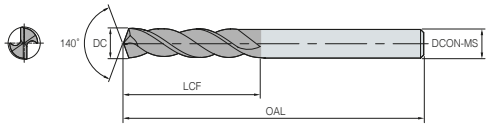
Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Extern		

(mm)

Designation		3D			5D			7D			DC	DCON-MS
		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL		
WSDP	010 - X D	▲	5	38	▲	8	38	○	-	-	1	3
	011 - X D	▲	6	42	▲	9	42	○	-	-	1,1	3
	012 - X D	▲	6	42	▲	10	42	○	-	-	1,2	3
	013 - X D	▲	6	42	▲	10	42	○	-	-	1,3	3
	014 - X D	▲	7	42	▲	11	42	○	-	-	1,4	3
	015 - X D	▲	7	42	▲	11	42	○	-	-	1,5	3
	016 - X D	▲	8	42	▲	12	42	○	-	-	1,6	3
	017 - X D	▲	8	42	▲	12	42	○	-	-	1,7	3
	018 - X D	▲	9	42	▲	13	42	○	-	-	1,8	3
	019 - X D	▲	9	42	▲	13	42	○	-	-	1,9	3
	020 - X D	▲	10	50	▲	18	50	○	-	-	2	3
	021 - X D	▲	10	50	▲	18	50	○	-	-	2,1	3
	022 - X D	▲	11	50	▲	18	50	○	-	-	2,2	3
	023 - X D	▲	11	50	▲	18	50	○	-	-	2,3	3
	024 - X D	▲	12	50	▲	18	50	○	-	-	2,4	3
	025 - X D	▲	12	50	▲	18	50	○	-	-	2,5	3
	026 - X D	▲	12	50	▲	18	50	○	-	-	2,6	3
	027 - X D	▲	14	50	▲	18	50	○	-	-	2,7	3
	028 - X D	▲	14	50	▲	18	50	○	-	-	2,8	3
	029 - X D	▲	14	50	▲	18	50	○	-	-	2,9	3
	030 - X D	▲	14	55	▲	20	55	▲	45	80	3	3
	031 - X D	▲	16	55	▲	20	55	▲	45	80	3,1	4
	032 - X D	▲	16	55	▲	20	55	▲	45	80	3,2	4
	033 - X D	▲	16	55	▲	20	55	▲	45	80	3,3	4
	034 - X D	▲	16	55	▲	20	55	▲	45	80	3,4	4
	035 - X D	▲	16	55	▲	20	55	▲	45	80	3,5	4
	036 - X D	▲	18	55	▲	25	55	▲	45	80	3,6	4
	037 - X D	▲	18	55	▲	25	55	▲	45	80	3,7	4
	038 - X D	▲	20	55	▲	25	55	▲	45	80	3,8	4
	039 - X D	▲	20	55	▲	25	55	▲	45	80	3,9	4
	040 - X D	▲	20	55	▲	25	55	▲	45	80	4	4
	041 - X D	▲	20	55	▲	25	55	▲	45	80	4,1	5
	042 - X D	▲	20	62	▲	33	63	▲	45	80	4,2	5
	043 - X D	▲	22	62	▲	33	63	▲	45	80	4,3	5
	044 - X D	▲	22	62	▲	33	63	▲	45	80	4,4	5
	045 - X D	▲	22	62	▲	33	63	▲	45	80	4,5	5
	046 - X D	▲	22	62	▲	33	63	▲	45	80	4,6	5
	047 - X D	▲	22	62	▲	33	63	▲	45	80	4,7	5
	048 - X D	▲	24	62	▲	33	63	▲	45	80	4,8	5
	049 - X D	▲	24	62	▲	33	63	▲	45	80	4,9	5
	050 - X D	▲	24	62	▲	33	63	▲	45	80	5	5
	051 - X D	▲	24	62	▲	33	63	▲	45	80	5,1	6
	052 - X D	▲	28	66	▲	36	66	▲	50	83	5,2	6
	053 - X D	▲	28	66	▲	36	66	▲	50	83	5,3	6
	054 - X D	▲	28	66	▲	36	66	▲	50	83	5,4	6
	055 - X D	▲	28	66	▲	36	66	▲	50	83	5,5	6
	056 - X D	▲	28	66	▲	36	66	▲	50	83	5,6	6
	057 - X D	▲	28	66	▲	36	66	▲	50	83	5,7	6

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDP- X D



DC		DCON-MS
D1 - D3	0 - -0.010 mm	h6
D3.1 - D6	0 - -0.012 mm	
D6.1 - D10	0 - -0.015 mm	
D10.1 - D18	0 - -0.018 mm	
D18.1 -	0 - -0.021 mm	

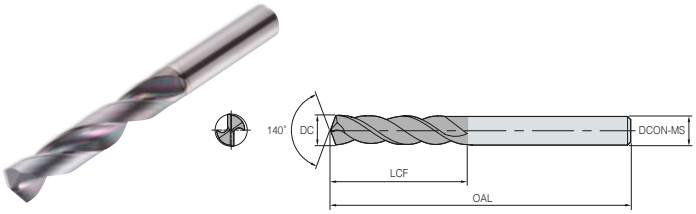
Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Extern		

(mm)

Designation		3D			5D			7D			DC	DCON-MS
		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL		
WSDP	058 - X D	▲	28	66	▲	36	66	▲	50	83	5,8	6
	059 - X D	▲	28	66	▲	36	66	▲	50	83	5,9	6
	060 - X D	▲	28	66	▲	36	66	▲	50	83	6	6
	061 - X D	▲	30	66	▲	36	66	▲	50	83	6,1	7
	062 - X D	▲	34	74	▲	42	75	▲	53	85	6,2	7
	063 - X D	▲	34	74	▲	42	75	▲	53	85	6,3	7
	064 - X D	▲	34	74	▲	42	75	▲	53	85	6,4	7
	065 - X D	▲	34	74	▲	42	75	▲	53	85	6,5	7
	066 - X D	▲	34	74	▲	42	75	▲	53	85	6,6	7
	067 - X D	▲	37	74	▲	42	75	▲	53	85	6,7	7
	068 - X D	▲	37	74	▲	42	75	▲	53	85	6,8	7
	069 - X D	▲	37	74	▲	42	75	▲	53	85	6,9	7
	070 - X D	▲	37	74	▲	42	75	▲	53	85	7	7
	071 - X D	▲	37	74	▲	42	75	▲	53	85	7,1	8
	072 - X D	▲	40	79	▲	46	80	▲	58	90	7,2	8
	073 - X D	▲	40	79	▲	46	80	▲	58	90	7,3	8
	074 - X D	▲	40	79	▲	46	80	▲	58	90	7,4	8
	075 - X D	▲	40	79	▲	46	80	▲	58	90	7,5	8
	076 - X D	▲	40	79	▲	46	80	▲	58	90	7,6	8
	077 - X D	▲	40	79	▲	46	80	▲	58	90	7,7	8
	078 - X D	▲	40	79	▲	46	80	▲	58	90	7,8	8
	079 - X D	▲	40	79	▲	46	80	▲	58	90	7,9	8
	080 - X D	▲	40	79	▲	46	80	▲	58	90	8	8
	081 - X D	▲	40	79	▲	46	80	▲	58	90	8,1	9
	082 - X D	▲	43	84	▲	50	85	▲	64	98	8,2	9
	083 - X D	▲	43	84	▲	50	85	▲	64	98	8,3	9
	084 - X D	▲	43	84	▲	50	85	▲	64	98	8,4	9
	085 - X D	▲	43	84	▲	50	85	▲	64	98	8,5	9
	086 - X D	▲	43	84	▲	50	85	▲	64	98	8,6	9
	087 - X D	▲	43	84	▲	50	85	▲	64	98	8,7	9
	088 - X D	▲	43	84	▲	50	85	▲	64	98	8,8	9
	089 - X D	▲	43	84	▲	50	85	▲	64	98	8,9	9
	090 - X D	▲	43	84	▲	50	85	▲	64	98	9	9
	091 - X D	▲	43	84	▲	50	85	▲	64	98	9,1	10
	092 - X D	▲	47	89	▲	55	90	▲	68	105	9,2	10
	093 - X D	▲	47	89	▲	55	90	▲	68	105	9,3	10
	094 - X D	▲	47	89	▲	55	90	▲	68	105	9,4	10
	095 - X D	▲	47	89	▲	55	90	▲	68	105	9,5	10
	096 - X D	▲	47	89	▲	55	90	▲	68	105	9,6	10
	097 - X D	▲	47	89	▲	55	90	▲	68	105	9,7	10
	098 - X D	▲	47	89	▲	55	90	▲	68	105	9,8	10
	099 - X D	▲	47	89	▲	55	90	▲	68	105	9,9	10
	100 - X D	▲	47	89	▲	55	90	▲	68	105	10	10
	101 - X D	▲	47	89	▲	55	90	▲	68	105	10,1	11
	102 - X D	▲	51	95	▲	57	95	▲	73	110	10,2	11
	103 - X D	▲	51	95	▲	57	95	▲	73	110	10,3	11
	104 - X D	▲	51	95	▲	57	95	▲	73	110	10,4	11
	105 - X D	▲	51	95	▲	57	95	▲	73	110	10,5	11

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDP- X D



DC		DCON-MS
D1 - D3	0 - -0.010 mm	h6
D3.1 - D6	0 - -0.012 mm	
D6.1 - D10	0 - -0.015 mm	
D10.1 - D18	0 - -0.018 mm	
D18.1 -	0 - -0.021 mm	

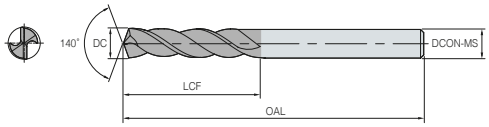
Specification	P M K
Twist angle	Streamlined
Thinning	XR type
Coolant	Extern

(mm)

Designation		3D			5D			7D			DC	DCON-MS
		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL		
WSDP	106 - X D	▲	51	95	▲	57	95	▲	73	110	10,6	11
	107 - X D	▲	51	95	▲	57	95	▲	73	110	10,7	11
	108 - X D	▲	51	95	▲	57	95	▲	73	110	10,8	11
	109 - X D	▲	51	95	▲	57	95	▲	73	110	10,9	11
	110 - X D	▲	51	95	▲	57	95	▲	73	110	11	11
	110 - X D	▲	51	95	▲	57	95	▲	73	110	11,1	12
	112 - X D	▲	54	102	▲	63	102	▲	80	120	11,2	12
	113 - X D	▲	54	102	▲	63	102	▲	80	120	11,3	12
	114 - X D	▲	54	102	▲	63	102	▲	80	120	11,4	12
	115 - X D	▲	54	102	▲	63	102	▲	80	120	11,5	12
	116 - X D	▲	54	102	▲	63	102	▲	80	120	11,6	12
	117 - X D	▲	54	102	▲	63	102	▲	80	120	11,7	12
	118 - X D	▲	54	102	▲	63	102	▲	80	120	11,8	12
	119 - X D	▲	54	102	▲	63	102	▲	80	120	11,9	12
	120 - X D	▲	54	102	▲	63	102	▲	80	120	12	12
	121 - X D	▲	54	102	▲	63	102	▲	80	120	12,1	13
	122 - X D	▲	57	102	▲	63	102	▲	90	137	12,2	13
	123 - X D	▲	57	102	▲	63	102	▲	90	137	12,3	13
	124 - X D	▲	57	102	▲	63	102	▲	90	137	12,4	13
	125 - X D	▲	57	102	▲	63	102	▲	90	137	12,5	13
	126 - X D	▲	57	102	▲	63	102	▲	90	137	12,6	13
	127 - X D	▲	57	102	▲	63	102	▲	90	137	12,7	13
	128 - X D	▲	57	102	▲	63	102	▲	90	137	12,8	13
	129 - X D	▲	57	102	▲	63	102	▲	90	137	12,9	13
	130 - X D	▲	57	102	▲	63	102	▲	90	137	13	13
	131 - X D	○	-	-	▲	63	102	▲	90	137	13,1	14
	132 - X D	○	-	-	▲	65	107	▲	96	147	13,2	14
	133 - X D	○	-	-	▲	65	107	▲	96	147	13,3	14
	134 - X D	○	-	-	▲	65	107	▲	96	147	13,4	14
	135 - X D	○	-	-	▲	65	107	▲	96	147	13,5	14
	136 - X D	○	-	-	▲	65	107	▲	96	147	13,6	14
	137 - X D	○	-	-	▲	65	107	▲	96	147	13,7	14
	138 - X D	○	-	-	▲	65	107	▲	96	147	13,8	14
	139 - X D	○	-	-	▲	65	107	▲	96	147	13,9	14
	140 - X D	○	-	-	▲	65	107	▲	96	147	14	14
	141 - X D	○	-	-	▲	65	107	▲	96	147	14,1	15
	142 - X D	○	-	-	▲	67	111	▲	100	153	14,2	15
	143 - X D	○	-	-	▲	67	111	▲	100	153	14,3	15
	144 - X D	○	-	-	▲	67	111	▲	100	153	14,4	15
	145 - X D	○	-	-	▲	67	111	▲	100	153	14,5	15
	146 - X D	○	-	-	▲	67	111	▲	100	153	14,6	15
	147 - X D	○	-	-	▲	67	111	▲	100	153	14,7	15
	148 - X D	○	-	-	▲	67	111	▲	100	153	14,8	15
	149 - X D	○	-	-	▲	67	111	▲	100	153	14,9	15
	150 - X D	○	-	-	▲	67	111	▲	100	153	15	15
	151 - X D	○	-	-	▲	67	111	▲	100	153	15,1	16
	152 - X D	○	-	-	▲	69	115	▲	112	160	15,2	16

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDP- X D



DC		DCON-MS
D1 - D3	0 - -0.010 mm	h6
D3.1 - D6	0 - -0.012 mm	
D6.1 - D10	0 - -0.015 mm	
D10.1 - D18	0 - -0.018 mm	
D18.1 -	0 - -0.021 mm	

Specification	P M K
Twist angle	Streamlined
Thinning	XR type
Coolant	Extern

(mm)

Designation		3D			5D			7D			DC	DCON-MS
		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL		
WSDP	154 - X D	○	-	-	▲	69	115	▲	112	160	15,4	16
	155 - X D	○	-	-	▲	69	115	▲	112	160	15,5	16
	156 - X D	○	-	-	▲	69	115	▲	112	160	15,6	16
	157 - X D	○	-	-	▲	69	115	▲	112	160	15,7	16
	158 - X D	○	-	-	▲	69	115	▲	112	160	15,8	16
	160 - X D	○	-	-	▲	69	115	▲	112	160	16	16
	161 - X D	○	-	-	▲	69	115	▲	112	160	16,1	17
	163 - X D	○	-	-	▲	71	119	▲	112	160	16,3	17
	165 - X D	○	-	-	▲	71	119	▲	112	160	16,5	17
	170 - X D	○	-	-	▲	71	119	▲	112	160	17	17
	171 - X D	○	-	-	▲	71	119	▲	112	160	17,1	18
	172 - X D	○	-	-	▲	74	123	▲	112	160	17,2	18
	175 - X D	○	-	-	▲	74	123	▲	112	160	17,5	18
	177 - X D	○	-	-	▲	74	123	▲	112	160	17,7	18
	178 - X D	○	-	-	▲	74	123	▲	112	160	17,8	18
	180 - X D	○	-	-	▲	74	123	▲	112	160	18	18
	181 - X D	○	-	-	▲	74	123	▲	112	160	18,1	19
	182 - X D	○	-	-	▲	76	127	▲	112	160	18,2	19
	185 - X D	○	-	-	▲	76	127	▲	112	160	18,5	19
	190 - X D	○	-	-	▲	76	127	▲	112	160	19	19
	191 - X D	○	-	-	▲	76	127	▲	112	160	19,1	20
	195 - X D	○	-	-	▲	80	131	▲	112	160	19,5	20
	197 - X D	○	-	-	▲	80	131	▲	112	160	19,7	20
	200 - X D	○	-	-	▲	80	131	▲	112	160	20	20

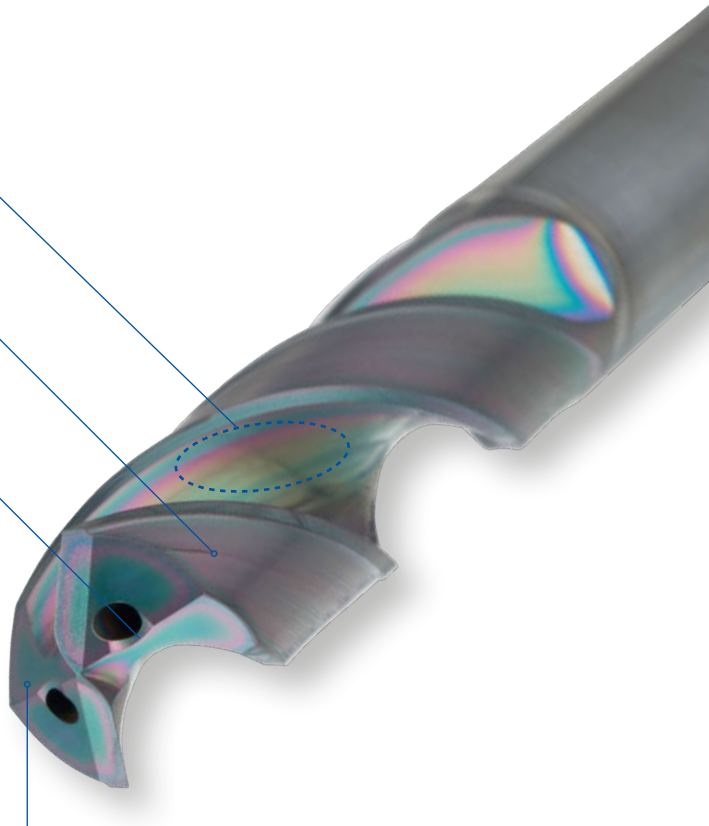
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDPH - Code system

Special type

WSDP	H	040	-	5D	100L	-	5S
W-Star Drill Plus	**Oil hole** H = Oil hole	**Drill diameter (DC)** 040 = Ø4.0mm		**Aspect ratio (L/D)** 3D, 5D, 8D **Special type** Flute length 100 = 100 mm	**Overall length** 100L: 100mm		**Shank diameter** 5S: Ø5.0mm

Features



Minimized chip packing

- Deep chip pockets with 3D to 8D machining depth
- Minimized chip packing reduces scratches inside the hole, thereby enhancing machining quality

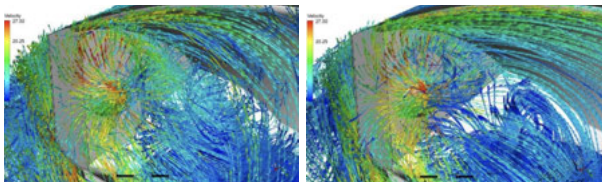
Detailed line up

- 3D : DIN 6537, HB/HE Shank
- 5D : DIN 6537, HB/HE Shank
- 8D : KORLOY Standard

New tip groove geometry

- Enhanced cooling effect due to increased coolant flow rate and volume at the cutting edge and periphery
- Enhanced chip evacuation capability due to increased coolant flow rate in the flute

Improved Cooling



WSDPH Competitor

Improved XR thinning

- Enhanced chip evacuation capability through thinning surface finishing
- Improved surface integrity of the cutting edge enhances resistance to catastrophic failure and chipping
- Applying streamlined thinning disperses the cutting force at the machining tip, which reduces the cutting load

WSDPH - Application range

◎: 1st recommendation ○: 2nd recommendation

P			M	K	N	H	
Carbon steel	Alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Non-ferrous & Aluminum	Hardened steel	
-HB225	HB225-325	HRC30-50				SKD61 -HRC55	SKD11 HRC55-
◎	◎	◎	◎	○	○	○	–

WSDPH - Recommended cutting conditions

Pièce	P						M		K			
	Carbon Steel, Alloy Steel SS400, SM50C, SCM, SCr -900N/mm² /-HRC 28		Alloy Steel SCM, SCr -1,100N/mm² HRC 28-35		Alloy Steel Hardened Steel -HRC40		Stainless Steel SUS300, SUS400		Cast iron -350N/mm²		Ductile Iron 400-600N/mm²	
cutting conditions	80-120 m/min		60-90 m/min		30-60 m/min		40-70 m/min		80-120 m/min		60-100 m/min	
DC (Ø)	RPM n (min $^{-1}$)	fn (mm/rev)	RPM n (min $^{-1}$)	fn (mm/rev)	RPM n (min $^{-1}$)	fn (mm/rev)	RPM n (min $^{-1}$)	fn (mm/rev)	RPM n (min $^{-1}$)	fn (mm/rev)	RPM n (min $^{-1}$)	fn (mm/rev)
2	10,600	0.09	8,000	0.09	4,800	0.08	5,800	0.09	10,600	0.09	8,500	0.09
4	8,000	0.14	6,000	0.14	3,600	0.1	4,400	0.14	8,000	0.14	6,400	0.14
6	5,300	0.17	4,000	0.17	2,400	0.14	2,900	0.17	5,300	0.17	4,200	0.21
8	4,000	0.21	3,000	0.21	1,800	0.18	2,200	0.21	4,000	0.21	3,200	0.24
10	3,200	0.25	2,400	0.25	1,400	0.22	1,800	0.25	3,200	0.25	2,500	0.26
12	2,700	0.27	2,000	0.27	1,200	0.24	1,500	0.27	2,700	0.27	2,100	0.28
14	2,300	0.29	1,700	0.29	1,000	0.26	1,300	0.29	2,300	0.29	1,800	0.31
16	2,000	0.31	1,500	0.31	900	0.29	1,100	0.31	2,000	0.31	1,600	0.33
18	1,800	0.33	1,300	0.33	800	0.32	1,000	0.33	1,800	0.33	1,400	0.35
20	1,600	0.35	1,200	0.35	700	0.34	900	0.35	1,600	0.35	1,300	0.37

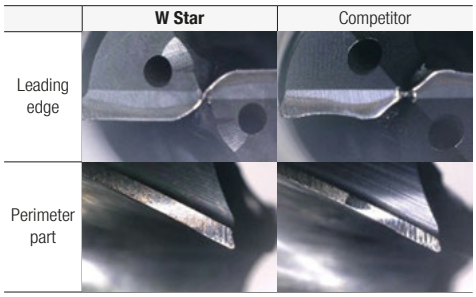
※ In actual machinning, the condition should be adjusted according to the machining shape, purpose and machine type.

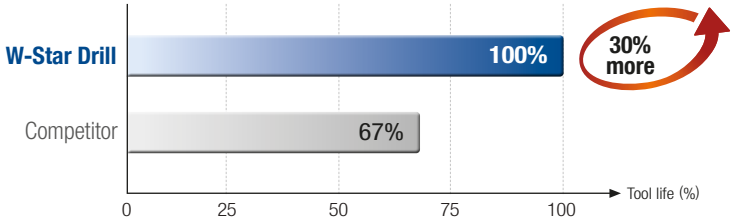
* **7D** : apply 75 % of above cutting condition

Application examples

Carbon steel - C45

Cutting condition	vc = 100 m/min · fn = 0,24 mm/rev · ap = 30 mm · wet
Tool	WSDPH060-5D (Tool diameter = Ø6 mm)

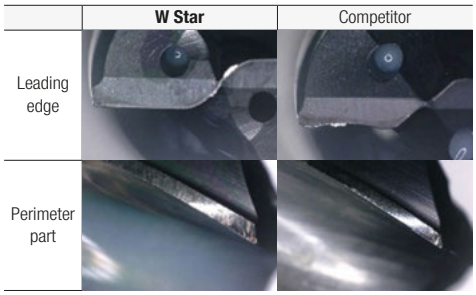


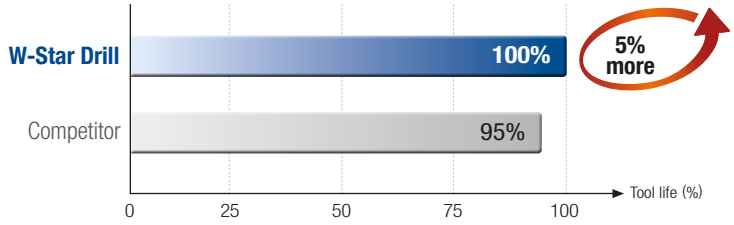


30% longer tool life compared to the competitor

Alloy Steel - 42CrMo4

Cutting condition	vc = 80,0 m/min · fn = 0,20 mm/rev · ap = 30 mm · wet
Tool	WSDPH060-5D (Tool diameter = Ø6 mm)

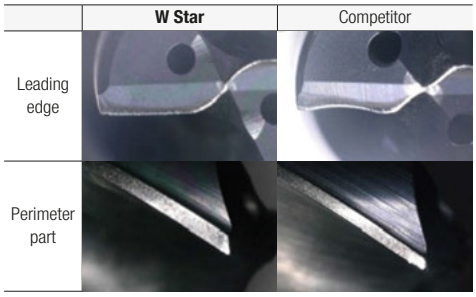


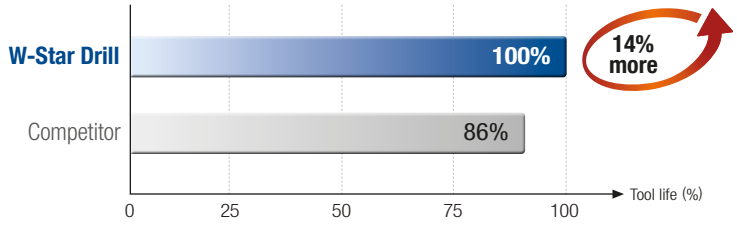


5% longer tool life compared to the competitor

Stainless Steel - X5CrNi18-9

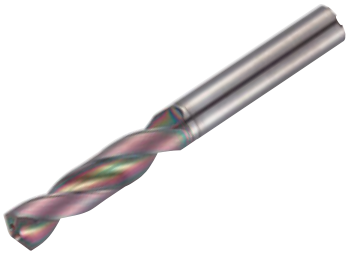
Cutting condition	vc = 60,0 m/min · fn = 0,14 mm/rev · ap = 19 mm · wet
Tool	WSDPH060-5D (Tool diameter = Ø6 mm)





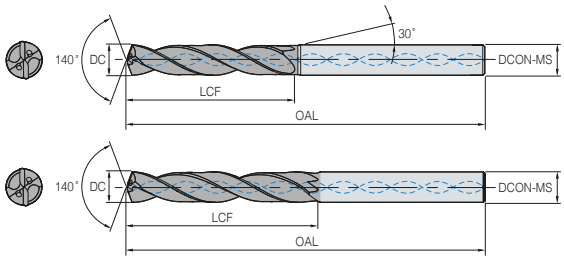
14% longer tool life compared to the competitor

WSDPH-XD



DC		DCON-MS
D3	+0.002 - - 0.012 mm	h6
D3.1 - D6	+0.004 - - 0.016 mm	
D6.1 - D10	+0.006 - - 0.021 mm	
D10.1 - D13	+0.007 - - 0.025 mm	
D18.1 - D20	+0.008 - - 0.029 mm	

Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Intern		

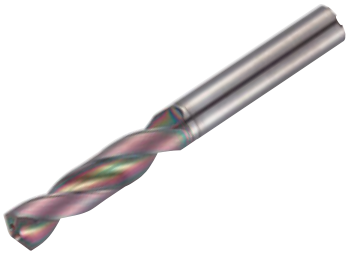


(mm)

Designation		DC		DCON-MS	3D			5D			8D			Applicable Tap
		metric	inch		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL	TDZ × TP
WSDPH	030-XD	3		6	▲	20	62	▲	28	66	▲	31	74	
	031-XD	3.1		6	▲	20	62	▲	28	66	▲	36	81	
	03175-XD	3.175	1/8	6	▲	20	62	▲	28	66	▲	36	81	
	032-XD	3.2		6	▲	20	62	▲	28	66	▲	36	81	
	033-XD	3.3		6	▲	20	62	▲	28	66	▲	36	81	M4x0.7
	034-XD	3.4		6	▲	20	62	▲	28	66	▲	36	81	M4x0.7
	035-XD	3.5		6	▲	20	62	▲	28	66	▲	36	81	
	03572-XD	3.572	9/64	6	▲	20	62	▲	28	66	▲	41	86	
	036-XD	3.6		6	▲	20	62	▲	28	66	▲	41	86	
	037-XD	3.7		6	▲	20	62	▲	28	66	▲	41	86	
	038-XD	3.8		6	▲	24	66	▲	36	74	▲	41	86	
	039-XD	3.9		6	▲	24	66	▲	36	74	▲	41	86	
	03969-XD	3.969	5/32	6	▲	24	66	▲	36	74	▲	41	86	
	040-XD	4		6	▲	24	66	▲	36	74	▲	41	86	
	04039-XD	4.039	7/44	6	▲	24	66	▲	36	74	▲	46	91	
	041-XD	4.1		6	▲	24	66	▲	36	74	▲	46	91	
	042-XD	4.2		6	▲	24	66	▲	36	74	▲	46	91	M5x0.8
	043-XD	4.3		6	▲	24	66	▲	36	74	▲	46	91	M5x0.8
	04366-XD	4.366	11/64	6	▲	24	66	▲	36	74	▲	46	91	
	044-XD	4.4		6	▲	24	66	▲	36	74	▲	46	91	
	045-XD	4.5		6	▲	24	66	▲	36	74	▲	46	91	
	046-XD	4.6		6	▲	24	66	▲	36	74	▲	51	96	
	047-XD	4.7		6	▲	24	66	▲	36	74	▲	51	96	
	04763-XD	4.763	3/16	6	▲	28	66	▲	36	74	▲	51	96	
	048-XD	4.8		6	▲	28	66	▲	44	82	▲	51	96	
	049-XD	4.9		6	▲	28	66	▲	44	82	▲	51	96	
	050-XD	5		6	▲	28	66	▲	44	82	▲	51	96	M6x1.0
	051-XD	5.1		6	▲	28	66	▲	44	82	▲	57	102	M6x1.0
	05159-XD	5.159	13/64	6	▲	28	66	▲	44	82	▲	57	102	
	052-XD	5.2		6	▲	28	66	▲	44	82	▲	57	102	
	053-XD	5.3		6	▲	28	66	▲	44	82	▲	57	102	
	054-XD	5.4		6	▲	28	66	▲	44	82	▲	57	102	
	055-XD	5.5		6	▲	28	66	▲	44	82	▲	57	102	
	05556-XD	5.556	7/32	6	▲	28	66	▲	44	82	▲	62	107	
	056-XD	5.6		6	▲	28	66	▲	44	82	▲	62	107	
	057-XD	5.7		6	▲	28	66	▲	44	82	▲	62	107	
	058-XD	5.8		6	▲	28	66	▲	44	82	▲	62	107	
	059-XD	5.9		6	▲	28	66	▲	44	82	▲	62	107	

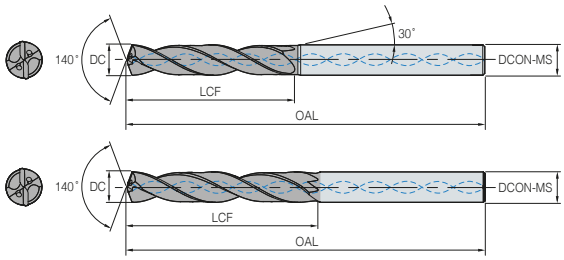
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDPH-XD



DC		DCON-MS
D3	+0.002 - - 0.012 mm	h6
D3.1 - D6	+0.004 - - 0.016 mm	
D6.1 - D10	+0.006 - - 0.021 mm	
D10.1 - D13	+0.007 - - 0.025 mm	
D18.1 - D20	+0.008 - - 0.029 mm	

Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Intern		

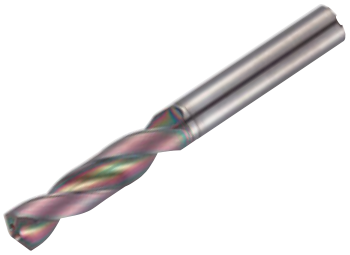


(mm)

Designation		DC		DCON-MS	3D			5D			8D			Applicable Tap
		metric	inch		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL	TDZ × TP
WSDPH	05953-XD	5.953	15/64	6	▲	28	66	▲	44	82	▲	62	107	
	060-XD	6		6	▲	28	66	▲	44	82	▲	62	107	
	061-XD	6.1		8	▲	34	79	▲	53	91	▲	71	116	
	062-XD	6.2		8	▲	34	79	▲	53	91	▲	71	116	
	063-XD	6.3		8	▲	34	79	▲	53	91	▲	71	116	
	0635-XD	6.35	1/4	8	▲	34	79	▲	53	91	▲	71	116	
	064-XD	6.4		8	▲	34	79	▲	53	91	▲	71	116	
	065-XD	6.5		8	▲	34	79	▲	53	91	▲	71	116	
	06528-XD	6.528	9/35	8	▲	34	79	▲	53	91	▲	71	116	
	066-XD	6.6		8	▲	34	79	▲	53	91	▲	71	116	
	067-XD	6.7		8	▲	34	79	▲	53	91	▲	71	116	
	06747-XD	6.747	17/64	8	▲	34	79	▲	53	91	▲	71	116	
	068-XD	6.8		8	▲	34	79	▲	53	91	▲	71	116	M8x1.25
	069-XD	6.9		8	▲	34	79	▲	53	91	▲	71	116	M8x1.25
	070-XD	7		8	▲	34	79	▲	53	91	▲	71	116	M8x1.0
	071-XD	7.1		8	▲	41	79	▲	53	91	▲	81	126	M8x1.0
	07144-XD	7.144	9/32	8	▲	41	79	▲	53	91	▲	81	126	
	072-XD	7.2		8	▲	41	79	▲	53	91	▲	81	126	
	073-XD	7.3		8	▲	41	79	▲	53	91	▲	81	126	
	074-XD	7.4		8	▲	41	79	▲	53	91	▲	81	126	
	075-XD	7.5		8	▲	41	79	▲	53	91	▲	81	126	
	07541-XD	7.541	19/64	8	▲	41	79	▲	53	91	▲	81	126	
	076-XD	7.6		8	▲	41	79	▲	53	91	▲	81	126	
	077-XD	7.7		8	▲	41	79	▲	53	91	▲	81	126	
	078-XD	7.8		8	▲	41	79	▲	53	91	▲	81	126	
	079-XD	7.9		8	▲	41	79	▲	53	91	▲	81	126	
	07938-XD	7.938	5/16	8	▲	41	79	▲	53	91	▲	81	126	
	080-XD	8		8	▲	41	79	▲	53	91	▲	81	126	
	081-XD	8.1		10	▲	47	89	▲	61	103	▲	92	137	
	082-XD	8.2		10	▲	47	89	▲	61	103	▲	92	137	
	083-XD	8.3		10	▲	47	89	▲	61	103	▲	92	137	
	08334-XD	8.334	21/64	10	▲	47	89	▲	61	103	▲	92	137	
	084-XD	8.4		10	▲	47	89	▲	61	103	▲	92	137	
	08433-XD	8.433		10	▲	47	89	▲	61	103	▲	92	137	
	085-XD	8.5		10	▲	47	89	▲	61	103	▲	92	137	M10x1.5
	086-XD	8.6		10	▲	47	89	▲	61	103	▲	92	137	M10x1.5
	087-XD	8.7		10	▲	47	89	▲	61	103	▲	92	137	
	08731-XD	8.731	11/32	10	▲	47	89	▲	61	103	▲	92	137	

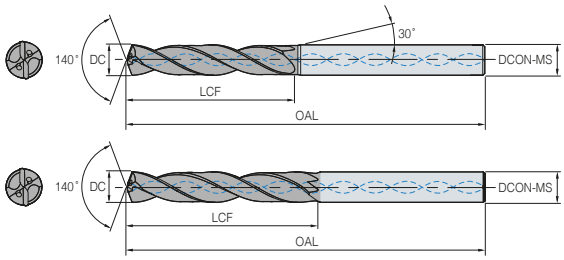
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDPH-XD



DC		DCON-MS
D3	+0.002 - - 0.012 mm	h6
D3.1 - D6	+0.004 - - 0.016 mm	
D6.1 - D10	+0.006 - - 0.021 mm	
D10.1 - D13	+0.007 - - 0.025 mm	
D18.1 - D20	+0.008 - - 0.029 mm	

Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Intern		

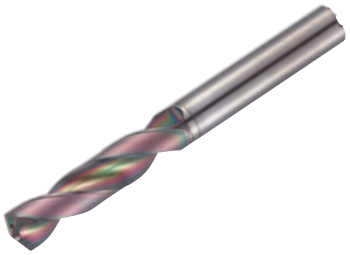


(mm)

Designation		DC		DCON-MS	3D			5D			8D			Applicable Tap
		metric	inch		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL	TDZ × TP
WSDPH	088-XD	8.8		10	▲	47	89	▲	61	103	▲	92	137	M10x1.25
	089-XD	8.9		10	▲	47	89	▲	61	103	▲	92	137	M10x1.25
	090-XD	9		10	▲	47	89	▲	61	103	▲	92	137	M10x1.0
	091-XD	9.1		10	▲	47	89	▲	61	103	▲	102	147	M10x1.0
	09128-XD	9.128	23/64	10	▲	47	89	▲	61	103	▲	102	147	
	092-XD	9.2		10	▲	47	89	▲	61	103	▲	102	147	
	093-XD	9.3		10	▲	47	89	▲	61	103	▲	102	147	
	09347-XD	9.347		10	▲	47	89	▲	61	103	▲	102	147	
	094-XD	9.4		10	▲	47	89	▲	61	103	▲	102	147	
	095-XD	9.5		10	▲	47	89	▲	61	103	▲	102	147	
	09525-XD	9.525	3/8	10	▲	47	89	▲	61	103	▲	102	147	
	096-XD	9.6		10	▲	47	89	▲	61	103	▲	102	147	
	097-XD	9.7		10	▲	47	89	▲	61	103	▲	102	147	
	098-XD	9.8		10	▲	47	89	▲	61	103	▲	102	147	
	099-XD	9.9		10	▲	47	89	▲	61	103	▲	102	147	
	09922-XD	9.922	25/64	10	▲	47	89	▲	61	103	▲	102	147	
	100-XD	10		10	▲	47	89	▲	61	103	▲	102	147	
	101-XD	10.1		12	▲	55	102	▲	71	118	▲	113	158	
	102-XD	10.2		12	▲	55	102	▲	71	118	▲	113	158	
	103-XD	10.3		12	▲	55	102	▲	71	118	▲	113	158	M12x1.75
	10319-XD	10.319	13/32	12	▲	55	102	▲	71	118	▲	113	158	M12x1.75
	104-XD	10.4		12	▲	55	102	▲	71	118	▲	113	158	M12x1.75
	105-XD	10.5		12	▲	55	102	▲	71	118	▲	113	158	M12x1.5
	106-XD	10.6		12	▲	55	102	▲	71	118	▲	113	158	M12x1.5
	107-XD	10.7		12	▲	55	102	▲	71	118	▲	113	158	
	10716-XD	10.716	27/64	12	▲	55	102	▲	71	118	▲	113	158	
	108-XD	10.8		12	▲	55	102	▲	71	118	▲	113	158	M12x1.25
	109-XD	10.9		12	▲	55	102	▲	71	118	▲	113	158	M12x1.25
	110-XD	11		12	▲	55	102	▲	71	118	▲	113	158	M12x1.0
	111-XD	11.1		12	▲	55	102	▲	71	118	▲	123	168	M12x1.0
	11113-XD	11.113	7/16	12	▲	55	102	▲	71	118	▲	123	168	
	112-XD	11.2		12	▲	55	102	▲	71	118	▲	123	168	
	113-XD	11.3		12	▲	55	102	▲	71	118	▲	123	168	
	114-XD	11.4		12	▲	55	102	▲	71	118	▲	123	168	
	115-XD	11.5		12	▲	55	102	▲	71	118	▲	123	168	
	11509-XD	11.509	29/64	12	▲	55	102	▲	71	118	▲	123	168	
	116-XD	11.6		12	▲	55	102	▲	71	118	▲	123	168	
	117-XD	11.7		12	▲	55	102	▲	71	118	▲	123	168	

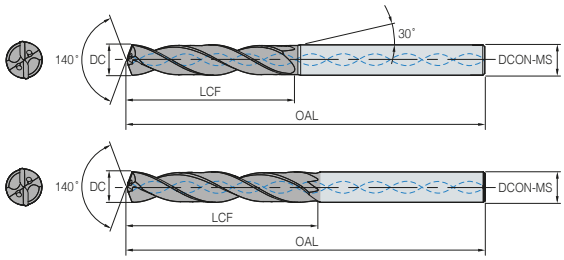
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDPH-XD



DC		DCON-MS
D3	+0.002 - - 0.012 mm	h6
D3.1 - D6	+0.004 - - 0.016 mm	
D6.1 - D10	+0.006 - - 0.021 mm	
D10.1 - D13	+0.007 - - 0.025 mm	
D18.1 - D20	+0.008 - - 0.029 mm	

Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Intern		

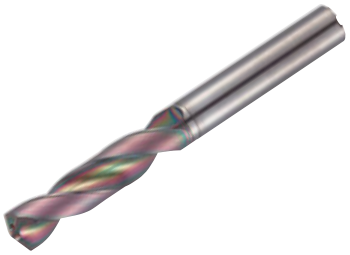


(mm)

Designation		DC		DCON-MS	3D			5D			8D			Applicable Tap
		metric	inch		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL	TDZ × TP
WSDPH	118-XD	11.8		12	▲	55	102	▲	71	118	▲	123	168	
	119-XD	11.9		12	▲	55	102	▲	71	118	▲	123	168	
	11906-XD	11.906	15/32	12	▲	55	102	▲	71	118	▲	123	168	
	120-XD	12		12	▲	55	102	▲	71	118	▲	123	168	M14x2.0
	121-XD	12.1		14	▲	60	107	▲	77	124	▲	134	179	M14x2.0
	122-XD	12.2		14	▲	60	107	▲	77	124	▲	134	179	
	123-XD	12.3		14	▲	60	107	▲	77	124	▲	134	179	
	12303-XD	12.303	31/64	14	▲	60	107	▲	77	124	▲	134	179	
	124-XD	12.4		14	▲	60	107	▲	77	124	▲	134	179	
	125-XD	12.5		14	▲	60	107	▲	77	124	▲	134	179	M14x1.5
	126-XD	12.6		14	▲	60	107	▲	77	124	▲	134	179	M14x1.5
	127-XD	12.7		14	▲	60	107	▲	77	124	▲	134	179	
	128-XD	12.8		14	▲	60	107	▲	77	124	▲	134	179	
	129-XD	12.9		14	▲	60	107	▲	77	124	▲	134	179	
	130-XD	13		14	▲	60	107	▲	77	124	▲	134	179	
	131-XD	13.1		14	▲	60	107	▲	77	124	▲	144	189	
	132-XD	13.2		14	▲	60	107	▲	77	124	▲	144	189	
	133-XD	13.3		14	▲	60	107	▲	77	124	▲	144	189	
	134-XD	13.4		14	▲	60	107	▲	77	124	▲	144	189	
	135-XD	13.5		14	▲	60	107	▲	77	124	▲	144	189	
	136-XD	13.6		14	▲	60	107	▲	77	124	▲	144	189	
	137-XD	13.7		14	▲	60	107	▲	77	124	▲	144	189	
	138-XD	13.8		14	▲	60	107	▲	77	124	▲	144	189	
	13891-XD	13.891	35/64	14	▲	60	107	▲	77	124	▲	144	189	
	139-XD	13.9		14	▲	60	107	▲	77	124	▲	144	189	
	140-XD	14		14	▲	60	107	▲	77	124	▲	144	189	M16x2.0
	141-XD	14.1		16	▲	65	115	▲	83	133	▲	155	200	M16x2.0
	142-XD	14.2		16	▲	65	115	▲	83	133	▲	155	200	
	14288-XD	14.288	9/16	16	▲	65	115	▲	83	133	▲	155	200	
	143-XD	14.3		16	▲	65	115	▲	83	133	▲	155	200	
	144-XD	14.4		16	▲	65	115	▲	83	133	▲	155	200	
	145-XD	14.5		16	▲	65	115	▲	83	133	▲	155	200	M16x1.5
	146-XD	14.6		16	▲	65	115	▲	83	133	▲	155	200	M16x1.5
	14684-XD	14.684	37/64	16	▲	65	115	▲	83	133	▲	155	200	
	147-XD	14.7		16	▲	65	115	▲	83	133	▲	155	200	
	148-XD	14.8		16	▲	65	115	▲	83	133	▲	155	200	
	149-XD	14.9		16	▲	65	115	▲	83	133	▲	155	200	
	150-XD	15		16	▲	65	115	▲	83	133	▲	155	200	

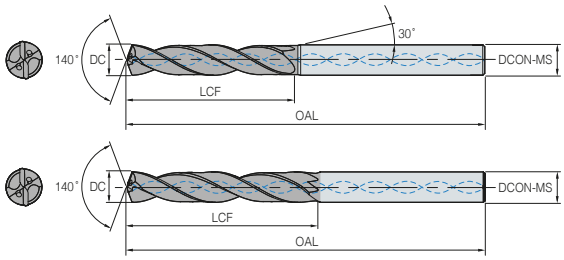
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

WSDPH-XD



DC		DCON-MS
D3	+0.002 - - 0.012 mm	h6
D3.1 - D6	+0.004 - - 0.016 mm	
D6.1 - D10	+0.006 - - 0.021 mm	
D10.1 - D13	+0.007 - - 0.025 mm	
D18.1 - D20	+0.008 - - 0.029 mm	

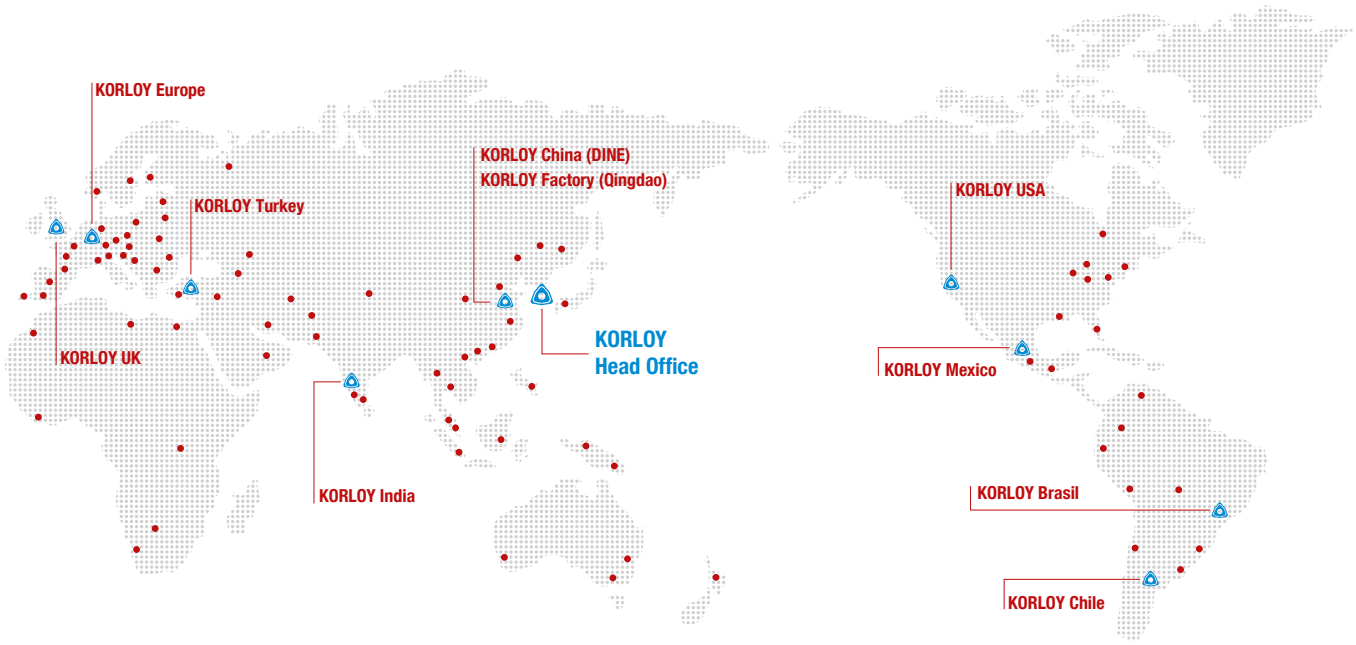
Specification	P	M	K
Twist angle	Streamlined		
Thinning	XR type		
Coolant	Intern		



(mm)

Designation		DC		DCON-MS	3D			5D			8D			Applicable Tap
		metric	inch		Stock	LCF	OAL	Stock	LCF	OAL	Stock	LCF	OAL	TDZ × TP
WSDPH	15081-XD	15.081	19/32	16	▲	65	115	▲	83	133	▲	165	210	
	151-XD	15.1		16	▲	65	115	▲	83	133	▲	165	210	
	152-XD	15.2		16	▲	65	115	▲	83	133	▲	165	210	
	153-XD	15.3		16	▲	65	115	▲	83	133	▲	165	210	
	154-XD	15.4		16	▲	65	115	▲	83	133	▲	165	210	
	15478-XD	15.478	39/64	16	▲	65	115	▲	83	133	▲	165	210	
	155-XD	15.5		16	▲	65	115	▲	83	133	▲	165	210	M18x2.5
	156-XD	15.6		16	▲	65	115	▲	83	133	▲	165	210	M18x2.5
	157-XD	15.7		16	▲	65	115	▲	83	133	▲	165	210	
	158-XD	15.8		16	▲	65	115	▲	83	133	▲	165	210	
	15875-XD	15.875	5/8	16	▲	65	115	▲	83	133	▲	165	210	
	159-XD	15.9		16	▲	65	115	▲	83	133	▲	165	210	
	160-XD	16		16	▲	65	115	▲	83	133	▲	165	210	
	16272-XD	16.272	41/64	18	▲	73	123	▲	93	143		-	-	
	165-XD	16.5		18	▲	73	123	▲	93	143		-	-	M18x1.5
	16669-XD	16.669	21/32	18	▲	73	123	▲	93	143		-	-	
	170-XD	17		18	▲	73	123	▲	93	143		-	-	
	17066-XD	17.066	43/64	18	▲	73	123	▲	93	143		-	-	
	17463-XD	17.463	11/16	18	▲	73	123	▲	93	143		-	-	
	175-XD	17.5		18	▲	73	123	▲	93	143		-	-	M20x2.5
	17859-XD	17.859	45/64	18	▲	73	123	▲	93	143		-	-	
	180-XD	18		18	▲	73	123	▲	93	143		-	-	
	18256-XD	18.256	23/32	20	▲	79	131	▲	101	153		-	-	
	185-XD	18.5		20	▲	79	131	▲	101	153		-	-	M20x1.5
	18654-XD	18.654	47/64	20	▲	79	131	▲	101	153		-	-	
	190-XD	19		20	▲	79	131	▲	101	153		-	-	
	1905-XD	19.05	3/4	20	▲	79	131	▲	101	153		-	-	
	1925-XD	19.25	72/95	20	▲	79	131	▲	101	153		-	-	
	19447-XD	19.447	49/64	20	▲	79	131	▲	101	153		-	-	
	195-XD	19.5		20	▲	79	131	▲	101	153		-	-	M22x2.5
	19844-XD	19.844	25/32	20	▲	79	131	▲	101	153		-	-	
	200-XD	20		20	▲	79	131	▲	101	153		-	-	

▲: Stock item Europe ●: Stock item Korea ○: Production on demand



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