Highly efficient hole making for various workpieces including components

MSD Plus new

Mach Solid Drill Plus

Code system

MSDP(H) 040 – 5 P – 100L – 5S

Special type

Oil hole
None: MSDP
With oil hole: MSDPH

Drill dia. (ØD)
040: Ø4.0
(One decimal place marked)

Standard type
Aspect ratio (L/D)
3D, 5D, 7D

Special type
Flute length
100: 100 mm

Machining area
P: Carbon steel, alloy steel
M: Stainless steel
K: Cast iron
N: Aluminum, copper alloy

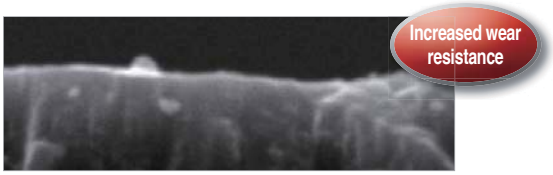
Overall length
100L: 100 mm

Shank dia.
5S: Ø5

Features

New grade (PC325U)

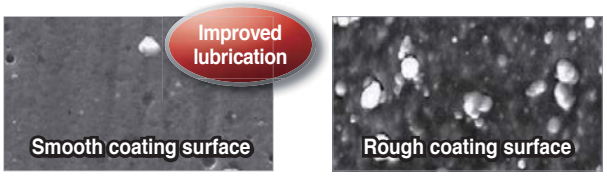
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



PC325U Competitor

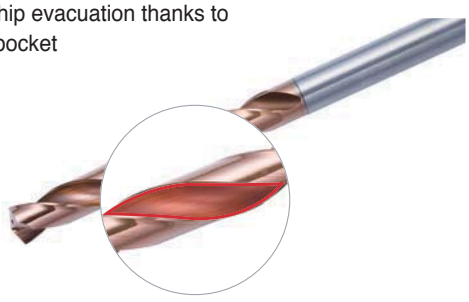
Chip control

- **Workpiece** SCM440
- **Cutting conditions** vc (m/min) = 90, fn (mm/rev) = 0.2, ap (mm) = 30, wet
- **Tools** MSDPH060-5P (PC325U)

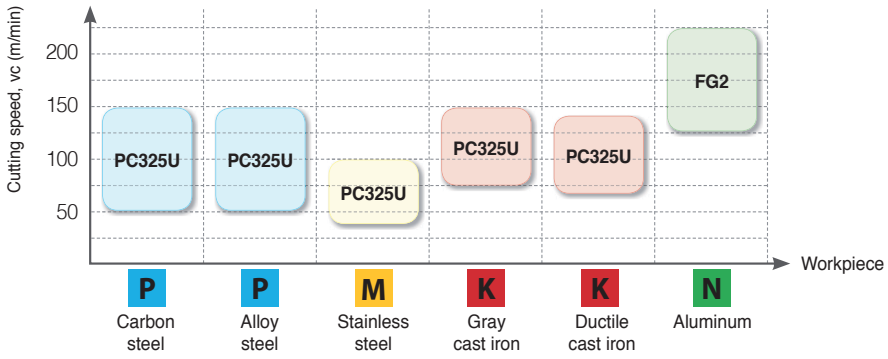
MSD Plus Competitor

Flute shape

- Improved chip evacuation thanks to wider chip pocket

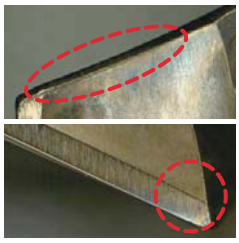


Application area

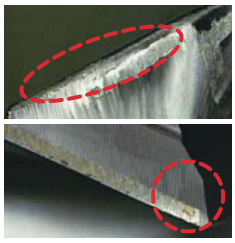


Application examples

- **Use** Part of Automobile
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 124, fn (mm/rev) = 0.15, ap (mm) = 30, Through coolant
- **Tools** MSDP120-5P (PC325U)

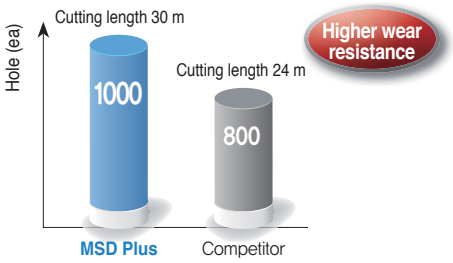


MSD Plus



Competitor

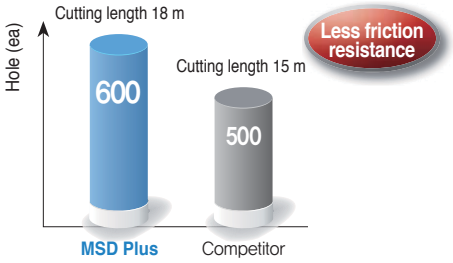
Test result



Lubricative coating layer of the new grade PC325U maximizes wear resistance.

- **Use** Part of Automobile
- **Workpiece** SM53C
- **Cutting conditions** vc (m/min) = 60, fn (mm/rev) = 0.25, ap (mm) = 30, External coolant
- **Tools** MSDP120-5P (PC325U)

Test result



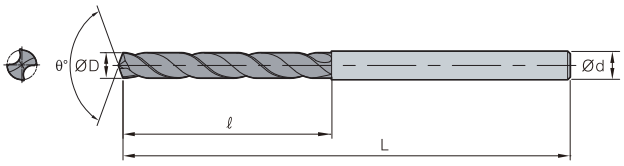
Special treatment on coating surface minimized frictional resistance.

Recommended cutting conditions

Workpiece				Grade	vc (m/min)	Feed				
						Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	HB			Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High carbon steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	Alloy steel	Low alloy steel	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Hardened low alloy steel	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High alloy steel	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		Hardened high alloy steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	Stainless steel	Austenite series	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		Ferrite series Martensite series	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	Cast iron	Gray cast iron	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Ductile cast iron	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	Aluminum	Aluminum alloy	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	Copper alloy	Copper alloy	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied
• In case of external coolant system, reduce the above feed values by 20%

MSDP-□(P/M/K/N)



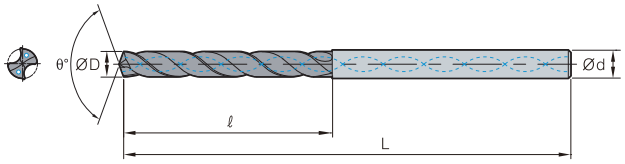
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N	
				ℓ	L	ℓ	L
MSDP	010 - □ P,M,K,N	1.0	3.0	6	45	12	66
	011 - □ P,M,K,N	1.1	3.0	7	45	12	66
	012 - □ P,M,K,N	1.2	3.0	8	45	12	66
	013 - □ P,M,K,N	1.3	3.0	8	45	12	66
	014 - □ P,M,K,N	1.4	3.0	9	45	12	66
	015 - □ P,M,K,N	1.5	3.0	9	45	12	66
	016 - □ P,M,K,N	1.6	3.0	10	45	15	66
	017 - □ P,M,K,N	1.7	3.0	10	45	15	66
	018 - □ P,M,K,N	1.8	3.0	11	45	15	66
	019 - □ P,M,K,N	1.9	3.0	11	45	15	66
	020 - □ P,M,K,N	2.0	3.0	14	53	20	66
	021 - □ P,M,K,N	2.1	3.0	14	53	20	66
	022 - □ P,M,K,N	2.2	3.0	14	53	20	66
	023 - □ P,M,K,N	2.3	3.0	14	53	20	66
	024 - □ P,M,K,N	2.4	3.0	14	53	20	66

MSDP(H)-□(P/M/K/N)



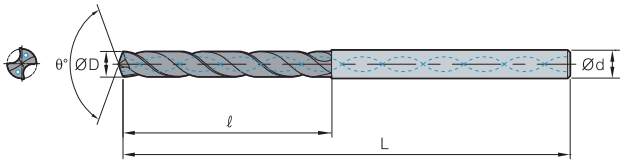
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	025 - □ P,M,K,N	2.5	3.0	14	53	20	66	30	70
	026 - □ P,M,K,N	2.6	3.0	17	53	20	66	30	70
	027 - □ P,M,K,N	2.7	3.0	17	53	20	66	30	70
	028 - □ P,M,K,N	2.8	3.0	17	53	20	66	30	70
	029 - □ P,M,K,N	2.9	3.0	17	53	20	66	30	70
	030 - □ P,M,K,N	3.0	3.0	17	53	20	66	30	70
	031 - □ P,M,K,N	3.1	4.0	20	58	28	74	30	70
	032 - □ P,M,K,N	3.2	4.0	20	58	28	74	30	70
	033 - □ P,M,K,N	3.3	4.0	20	58	28	74	30	70
	034 - □ P,M,K,N	3.4	4.0	20	58	28	74	37.5	75
	035 - □ P,M,K,N	3.5	4.0	20	58	28	74	37.5	75
	036 - □ P,M,K,N	3.6	4.0	22	58	32	74	37.5	75
	037 - □ P,M,K,N	3.7	4.0	22	58	32	74	37.5	75
	038 - □ P,M,K,N	3.8	4.0	22	58	32	74	37.5	75
	039 - □ P,M,K,N	3.9	4.0	22	58	32	74	37.5	75
	040 - □ P,M,K,N	4.0	4.0	22	58	32	74	37.5	75
	041 - □ P,M,K,N	4.1	5.0	24	62	36	82	37.5	75
	042 - □ P,M,K,N	4.2	5.0	24	62	36	82	37.5	75
	043 - □ P,M,K,N	4.3	5.0	24	62	36	82	45	85
	044 - □ P,M,K,N	4.4	5.0	24	62	36	82	45	85
	045 - □ P,M,K,N	4.5	5.0	24	62	36	82	45	85
	046 - □ P,M,K,N	4.6	5.0	26	62	38	82	45	85
	047 - □ P,M,K,N	4.7	5.0	26	62	38	82	45	85
	048 - □ P,M,K,N	4.8	5.0	26	62	38	82	50	90
	049 - □ P,M,K,N	4.9	5.0	26	62	38	82	50	90
	050 - □ P,M,K,N	5.0	5.0	26	62	38	82	50	90
	051 - □ P,M,K,N	5.1	6.0	28	66	44	82	50	90
	052 - □ P,M,K,N	5.2	6.0	28	66	44	82	50	90
	053 - □ P,M,K,N	5.3	6.0	28	66	44	82	50	90
	054 - □ P,M,K,N	5.4	6.0	28	66	44	82	50	90
	055 - □ P,M,K,N	5.5	6.0	28	66	44	82	57	97
	056 - □ P,M,K,N	5.6	6.0	28	66	44	82	57	97
	057 - □ P,M,K,N	5.7	6.0	28	66	44	82	57	97
	058 - □ P,M,K,N	5.8	6.0	28	66	44	82	57	97
	059 - □ P,M,K,N	5.9	6.0	28	66	44	82	57	97
	060 - □ P,M,K,N	6.0	6.0	28	66	44	82	57	97
	061 - □ P,M,K,N	6.1	7.0	34	74	50	91	66	106
	062 - □ P,M,K,N	6.2	7.0	34	74	50	91	66	106
	063 - □ P,M,K,N	6.3	7.0	34	74	50	91	66	106
	064 - □ P,M,K,N	6.4	7.0	34	74	50	91	66	106
	065 - □ P,M,K,N	6.5	7.0	34	74	50	91	66	106
	066 - □ P,M,K,N	6.6	7.0	34	74	50	91	66	106
	067 - □ P,M,K,N	6.7	7.0	34	74	50	91	66	106
	068 - □ P,M,K,N	6.8	7.0	34	74	50	91	66	106
	069 - □ P,M,K,N	6.9	7.0	34	74	50	91	76	116
	070 - □ P,M,K,N	7.0	7.0	34	74	50	91	76	116
	071 - □ P,M,K,N	7.1	8.0	41	79	53	91	76	116
	072 - □ P,M,K,N	7.2	8.0	41	79	53	91	76	116

MSDP(H)-□(P/M/K/N)



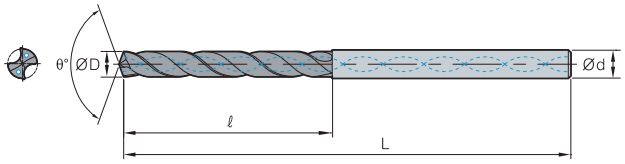
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	073 - □ P,M,K,N	7.3	8.0	41	79	53	91	76	116
	074 - □ P,M,K,N	7.4	8.0	41	79	53	91	76	116
	075 - □ P,M,K,N	7.5	8.0	41	79	53	91	76	116
	076 - □ P,M,K,N	7.6	8.0	41	79	53	91	76	116
	077 - □ P,M,K,N	7.7	8.0	41	79	53	91	76	116
	078 - □ P,M,K,N	7.8	8.0	41	79	53	91	76	116
	079 - □ P,M,K,N	7.9	8.0	41	79	53	91	76	116
	080 - □ P,M,K,N	8.0	8.0	43	84	58	98	87	131
	081 - □ P,M,K,N	8.1	9.0	43	84	58	98	87	131
	082 - □ P,M,K,N	8.2	9.0	43	84	58	98	87	131
	083 - □ P,M,K,N	8.3	9.0	43	84	58	98	87	131
	084 - □ P,M,K,N	8.4	9.0	43	84	58	98	87	131
	085 - □ P,M,K,N	8.5	9.0	43	84	58	98	87	131
	086 - □ P,M,K,N	8.6	9.0	43	84	58	98	87	131
	087 - □ P,M,K,N	8.7	9.0	43	84	58	98	87	131
	088 - □ P,M,K,N	8.8	9.0	43	84	58	98	87	131
	089 - □ P,M,K,N	8.9	9.0	43	84	58	98	87	131
	090 - □ P,M,K,N	9.0	9.0	43	84	58	98	87	131
	091 - □ P,M,K,N	9.1	10.0	47	89	61	105	95	139
	092 - □ P,M,K,N	9.2	10.0	47	89	61	105	95	139
	093 - □ P,M,K,N	9.3	10.0	47	89	61	105	95	139
	094 - □ P,M,K,N	9.4	10.0	47	89	61	105	95	139
	095 - □ P,M,K,N	9.5	10.0	47	89	61	105	95	139
	096 - □ P,M,K,N	9.6	10.0	47	89	61	105	95	139
	097 - □ P,M,K,N	9.7	10.0	47	89	61	105	95	139
	098 - □ P,M,K,N	9.8	10.0	47	89	61	105	95	139
	099 - □ P,M,K,N	9.9	10.0	47	89	61	105	95	139
	100 - □ P,M,K,N	10.0	10.0	47	89	61	105	95	139
	101 - □ P,M,K,N	10.1	11.0	55	95	68	114	106	155
	102 - □ P,M,K,N	10.2	11.0	55	95	68	114	106	155
	103 - □ P,M,K,N	10.3	11.0	55	95	68	114	106	155
	104 - □ P,M,K,N	10.4	11.0	55	95	68	114	106	155
	105 - □ P,M,K,N	10.5	11.0	55	95	68	114	106	155
	106 - □ P,M,K,N	10.6	11.0	55	95	68	114	106	155
	107 - □ P,M,K,N	10.7	11.0	55	95	68	114	106	155
	108 - □ P,M,K,N	10.8	11.0	55	95	68	114	106	155
	109 - □ P,M,K,N	10.9	11.0	55	95	68	114	106	155
	110 - □ P,M,K,N	11.0	11.0	55	95	68	114	106	155
	111 - □ P,M,K,N	11.1	12.0	55	102	71	120	114	163
	112 - □ P,M,K,N	11.2	12.0	55	102	71	120	114	163
	113 - □ P,M,K,N	11.3	12.0	55	102	71	120	114	163
	114 - □ P,M,K,N	11.4	12.0	55	102	71	120	114	163
	115 - □ P,M,K,N	11.5	12.0	55	102	71	120	114	163
	116 - □ P,M,K,N	11.6	12.0	55	102	71	120	114	163
	117 - □ P,M,K,N	11.7	12.0	55	102	71	120	114	163
	118 - □ P,M,K,N	11.8	12.0	55	102	71	120	114	163
	119 - □ P,M,K,N	11.9	12.0	55	102	71	120	114	163
	120 - □ P,M,K,N	12.0	12.0	55	102	71	120	114	163

MSDP(H)-□(P/M/K/N)



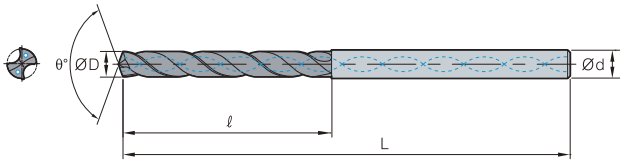
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	121 - □ P,M,K,N	12.1	13.0	60	107	77	124	133	182
	122 - □ P,M,K,N	12.2	13.0	60	107	77	124	133	182
	123 - □ P,M,K,N	12.3	13.0	60	107	77	124	133	182
	124 - □ P,M,K,N	12.4	13.0	60	107	77	124	133	182
	125 - □ P,M,K,N	12.5	13.0	60	107	77	124	133	182
	126 - □ P,M,K,N	12.6	13.0	60	107	77	124	133	182
	127 - □ P,M,K,N	12.7	13.0	60	107	77	124	133	182
	128 - □ P,M,K,N	12.8	13.0	60	107	77	124	133	182
	129 - □ P,M,K,N	12.9	13.0	60	107	77	124	133	182
	130 - □ P,M,K,N	13.0	13.0	60	107	77	124	133	182
	131 - □ P,M,K,N	13.1	14.0	62	107	80	133	133	182
	132 - □ P,M,K,N	13.2	14.0	62	107	80	133	133	182
	133 - □ P,M,K,N	13.3	14.0	62	107	80	133	133	182
	134 - □ P,M,K,N	13.4	14.0	62	107	80	133	133	182
	135 - □ P,M,K,N	13.5	14.0	62	107	80	133	133	182
	136 - □ P,M,K,N	13.6	14.0	62	107	80	133	133	182
	137 - □ P,M,K,N	13.7	14.0	62	107	80	133	133	182
	138 - □ P,M,K,N	13.8	14.0	62	107	80	133	133	182
	139 - □ P,M,K,N	13.9	14.0	62	107	80	133	133	182
	140 - □ P,M,K,N	14.0	14.0	62	107	80	133	133	182
	141 - □ P,M,K,N	14.1	15.0	65	115	85	143	152	204
	142 - □ P,M,K,N	14.2	15.0	65	115	85	143	152	204
	143 - □ P,M,K,N	14.3	15.0	65	115	85	143	152	204
	144 - □ P,M,K,N	14.4	15.0	65	115	85	143	152	204
	145 - □ P,M,K,N	14.5	15.0	65	115	85	143	152	204
	146 - □ P,M,K,N	14.6	15.0	65	115	85	143	152	204
	147 - □ P,M,K,N	14.7	15.0	65	115	85	143	152	204
	148 - □ P,M,K,N	14.8	15.0	65	115	85	143	152	204
	149 - □ P,M,K,N	14.9	15.0	65	115	85	143	152	204
	150 - □ P,M,K,N	15.0	15.0	65	115	85	143	152	204
	151 - □ P,M,K,N	15.1	16.0	68	115	88	143	152	204
	152 - □ P,M,K,N	15.2	16.0	68	115	88	143	152	204
	153 - □ P,M,K,N	15.3	16.0	68	115	88	143	152	204
	154 - □ P,M,K,N	15.4	16.0	68	115	88	143	152	204
	155 - □ P,M,K,N	15.5	16.0	68	115	88	143	152	204
	156 - □ P,M,K,N	15.6	16.0	68	115	88	143	152	204
	157 - □ P,M,K,N	15.7	16.0	68	115	88	143	152	204
	158 - □ P,M,K,N	15.8	16.0	68	115	88	143	152	204
	159 - □ P,M,K,N	15.9	16.0	68	115	88	143	152	204
	160 - □ P,M,K,N	16.0	16.0	68	115	88	143	152	204
	161 - □ P,M,K,N	16.1	17.0	73	123	93	153	171	223
	162 - □ P,M,K,N	16.2	17.0	73	123	93	153	171	223
	163 - □ P,M,K,N	16.3	17.0	73	123	93	153	171	223
	164 - □ P,M,K,N	16.4	17.0	73	123	93	153	171	223
	165 - □ P,M,K,N	16.5	17.0	73	123	93	153	171	223
	166 - □ P,M,K,N	16.6	17.0	73	123	93	153	171	223
	167 - □ P,M,K,N	16.7	17.0	73	123	93	153	171	223
	168 - □ P,M,K,N	16.8	17.0	73	123	93	153	171	223

MSDP(H)-□(P/M/K/N)



Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	169 - □ P,M,K,N	16.9	17.0	73	123	93	153	171	223
	170 - □ P,M,K,N	17.0	17.0	73	123	93	153	171	223
	171 - □ P,M,K,N	17.1	18.0	73	123	98	153	171	223
	172 - □ P,M,K,N	17.2	18.0	73	123	98	153	171	223
	173 - □ P,M,K,N	17.3	18.0	73	123	98	153	171	223
	174 - □ P,M,K,N	17.4	18.0	73	123	98	153	171	223
	175 - □ P,M,K,N	17.5	18.0	73	123	98	153	171	223
	176 - □ P,M,K,N	17.6	18.0	73	123	98	153	171	223
	177 - □ P,M,K,N	17.7	18.0	73	123	98	153	171	223
	178 - □ P,M,K,N	17.8	18.0	73	123	98	153	171	223
	179 - □ P,M,K,N	17.9	18.0	73	123	98	153	171	223
	180 - □ P,M,K,N	18.0	18.0	73	123	98	153	171	223
	181 - □ P,M,K,N	18.1	19.0	79	131	103	153	190	244
	182 - □ P,M,K,N	18.2	19.0	79	131	103	153	190	244
	183 - □ P,M,K,N	18.3	19.0	79	131	103	153	190	244
	184 - □ P,M,K,N	18.4	19.0	79	131	103	153	190	244
	185 - □ P,M,K,N	18.5	19.0	79	131	103	153	190	244
	186 - □ P,M,K,N	18.6	19.0	79	131	103	153	190	244
	187 - □ P,M,K,N	18.7	19.0	79	131	103	153	190	244
	188 - □ P,M,K,N	18.8	19.0	79	131	103	153	190	244
	189 - □ P,M,K,N	18.9	19.0	79	131	103	153	190	244
	190 - □ P,M,K,N	19.0	19.0	79	131	103	153	190	244
	191 - □ P,M,K,N	19.1	20.0	79	131	107	153	190	244
	192 - □ P,M,K,N	19.2	20.0	79	131	107	153	190	244
	193 - □ P,M,K,N	19.3	20.0	79	131	107	153	190	244
	194 - □ P,M,K,N	19.4	20.0	79	131	107	153	190	244
	195 - □ P,M,K,N	19.5	20.0	79	131	107	153	190	244
	196 - □ P,M,K,N	19.6	20.0	79	131	107	153	190	244
	197 - □ P,M,K,N	19.7	20.0	79	131	107	153	190	244
	198 - □ P,M,K,N	19.8	20.0	79	131	107	153	190	244
	199 - □ P,M,K,N	19.9	20.0	79	131	107	153	190	244
	200 - □ P,M,K,N	20.0	20.0	79	131	107	153	190	244

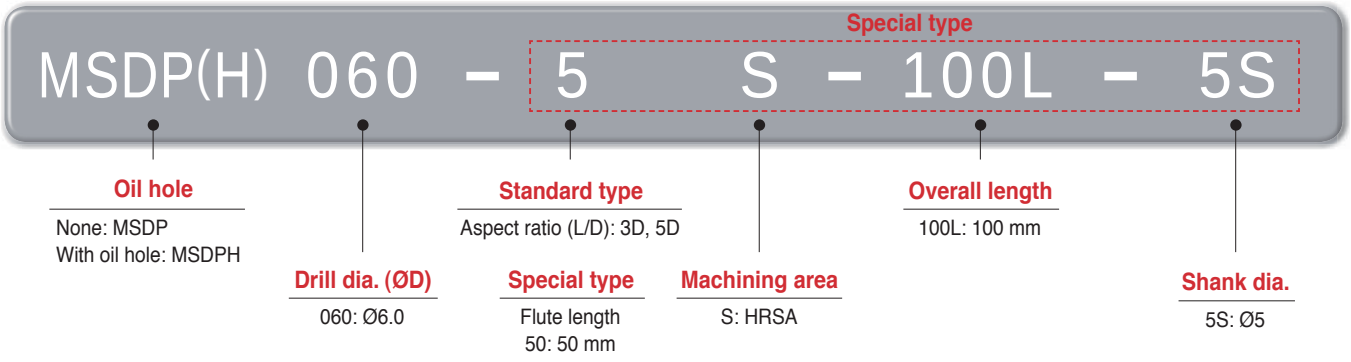
Specialized for heat-resistant alloys used in the aerospace, energy, power generation and automotive industries

MSD Plus-S new

Mach Solid Drill Plus-S

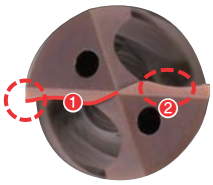
- Improved Productivity and Excellent Machinability
  - Ensuring machinability with optimized blade design and chip pockets
- Stronger wear resistance
  - Provides extended tool life due to its excellent coating with improved high temperature and chipping resistance

Code system



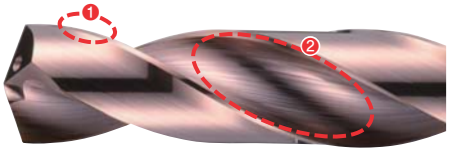
Features

- Notch-controlled blade design and specially treated cutting edges prevent chipping and breakage



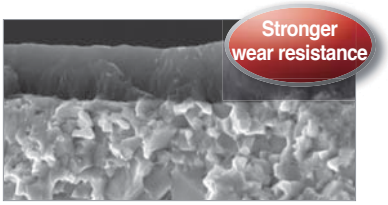
① Cutting edges designed for low cutting resistance
② Tip relief angle and shape optimized for heat evacuation

- Optimized margin and back-tapered design

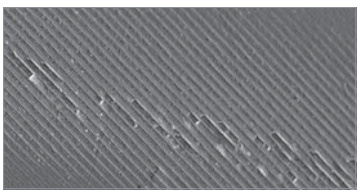


① Reduced friction resistance and cutting temperature
② Wider chip pockets improve chip evacuation

- Improved resistance to heat and oxidation thanks to the newly applied grade, PC325T
- Reduced friction resistance and improved chip evacuation due to excellent surface finish
- Exceptional wear resistance when machining heat-resistant alloys at high temperatures



PC325T



Smooth coating surface

Performance evaluation

- **Workpiece** Inconel718 (HRC40~45)
- **Cutting conditions** Drill dia.(mm) = Ø10, vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 30, wet
- **Tools** MSDPH100-5S (PC325T)

MSD Plus-S

Competitor

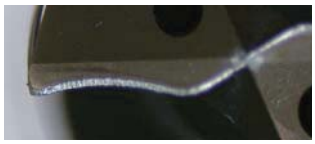
- **Workpiece** Ti-6Al-4V (HRC42~47)
- **Cutting conditions** Drill dia.(mm) = Ø10, vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 30, wet
- **Tools** MSDPH100-5S (PC325T)

MSD Plus-S

Competitor

Application examples

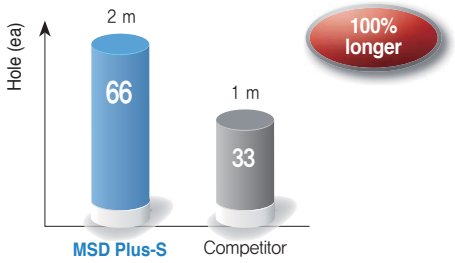
- **Use** Aircraft parts (turbine disks, turbine shafts, etc.) and components used in the power generation industry
- **Workpiece** Inconel718 (HRC40~45)
- **Cutting conditions** Drill dia.(mm) = Ø6.0, vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 30, wet
- **Tools** MSDPH060-5S



MSD Plus-S

Competitor

■ **Test result**

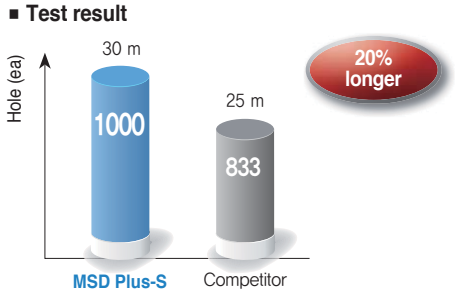


- **Use** Aircraft parts (engines, engine housings and turbine disks) and components used in the power generation industry
- **Workpiece** Ti-6Al-4V (HRC42~47)
- **Cutting conditions** Drill dia.(mm) = Ø6.0, vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 30, wet
- **Tools** MSDPH060-5S

MSD Plus-S

Competitor

■ **Test result**

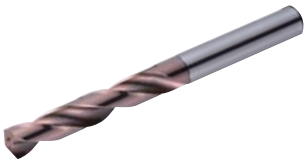


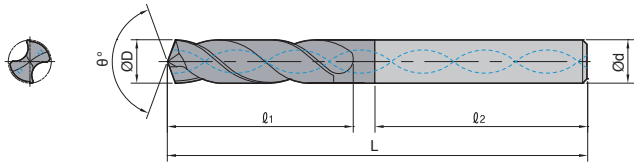
Recommended cutting conditions

Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 3D~5D			
						Feed rate (mm/rev) per drill dia. (mm)			
ISO		Workpiece	HB			Ø2.5~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	HRSA (Inconel 718 and etc.)	Fe-base	25~35	PC325T	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
		Ni or Co base	35~45	PC325T	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
	Titanium alloy (Ti-6Al-4V and etc.)	Pure titanium	10~15	PC325T	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
		α and β alloys	35~45	PC325T	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

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

MSDPH-S





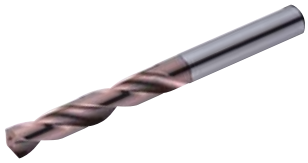
Specification	S
Grade	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
Point angle (θ°)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Internal

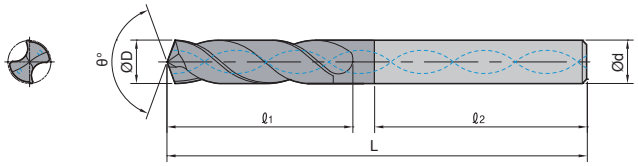
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	030-□S	3.0	6	20	62	28	66	36
	031-□S	3.1	6	20	62	28	66	36
	0318-□S	3.18	6	20	62	28	66	36
	032-□S	3.2	6	20	62	28	66	36
	033-□S	3.3	6	20	62	28	66	36
	034-□S	3.4	6	20	62	28	66	36
	035-□S	3.5	6	20	62	28	66	36
	0357-□S	3.57	6	20	62	28	66	36
	036-□S	3.6	6	20	62	28	66	36
	037-□S	3.7	6	20	62	28	66	36
	038-□S	3.8	6	24	66	36	74	36
	039-□S	3.9	6	24	66	36	74	36
	0397-□S	3.97	6	24	66	36	74	36
	040-□S	4.0	6	24	66	36	74	36
	041-□S	4.1	6	24	66	36	74	36
	042-□S	4.2	6	24	66	36	74	36
	043-□S	4.3	6	24	66	36	74	36
	0437-□S	4.37	6	24	66	36	74	36
	044-□S	4.4	6	24	66	36	74	36
	045-□S	4.5	6	24	66	36	74	36
	046-□S	4.6	6	24	66	36	74	36
	047-□S	4.7	6	24	66	36	74	36
	0476-□S	4.76	6	28	66	44	82	36
	048-□S	4.8	6	28	66	44	82	36
	049-□S	4.9	6	28	66	44	82	36
	050-□S	5.0	6	28	66	44	82	36
	051-□S	5.1	6	28	66	44	82	36
	0516-□S	5.16	6	28	66	44	82	36
	052-□S	5.2	6	28	66	44	82	36
	053-□S	5.3	6	28	66	44	82	36
	054-□S	5.4	6	28	66	44	82	36
	055-□S	5.5	6	28	66	44	82	36
	0556-□S	5.56	6	28	66	44	82	36
	056-□S	5.6	6	28	66	44	82	36
	057-□S	5.7	6	28	66	44	82	36
	058-□S	5.8	6	28	66	44	82	36
	059-□S	5.9	6	28	66	44	82	36
	0595-□S	5.95	6	28	66	44	82	36
	060-□S	6.0	6	28	66	44	82	36
	061-□S	6.1	8	34	79	53	91	36
	062-□S	6.2	8	34	79	53	91	36
	063-□S	6.3	8	34	79	53	91	36
	0635-□S	6.35	8	34	79	53	91	36
	064-□S	6.4	8	34	79	53	91	36
	065-□S	6.5	8	34	79	53	91	36

MSDPH-S





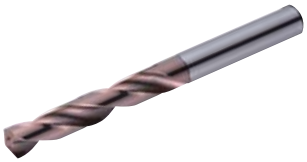
Specification	S
Grade	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
Point angle (θ°)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Internal

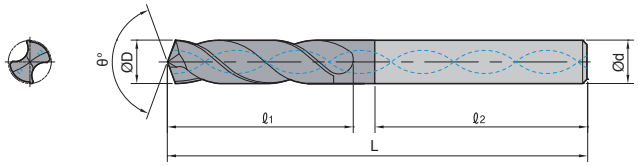
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	066-□S	6.6	8	34	79	53	91	36
	067-□S	6.7	8	34	79	53	91	36
	0675-□S	6.75	8	34	79	53	91	36
	068-□S	6.8	8	34	79	53	91	36
	069-□S	6.9	8	34	79	53	91	36
	070-□S	7.0	8	34	79	53	91	36
	071-□S	7.1	8	41	79	53	91	36
	0714-□S	7.14	8	41	79	53	91	36
	072-□S	7.2	8	41	79	53	91	36
	073-□S	7.3	8	41	79	53	91	36
	074-□S	7.4	8	41	79	53	91	36
	075-□S	7.5	8	41	79	53	91	36
	0754-□S	7.54	8	41	79	53	91	36
	076-□S	7.6	8	41	79	53	91	36
	077-□S	7.7	8	41	79	53	91	36
	078-□S	7.8	8	41	79	53	91	36
	079-□S	7.9	8	41	79	53	91	36
	0794-□S	7.94	8	41	79	53	91	36
	080-□S	8.0	8	41	79	53	91	36
	081-□S	8.1	10	47	89	61	103	40
	082-□S	8.2	10	47	89	61	103	40
	083-□S	8.3	10	47	89	61	103	40
	0833-□S	8.33	10	47	89	61	103	40
	084-□S	8.4	10	47	89	61	103	40
	085-□S	8.5	10	47	89	61	103	40
	086-□S	8.6	10	47	89	61	103	40
	087-□S	8.7	10	47	89	61	103	40
	0873-□S	8.73	10	47	89	61	103	40
	088-□S	8.8	10	47	89	61	103	40
	089-□S	8.9	10	47	89	61	103	40
	090-□S	9.0	10	47	89	61	103	40
	091-□S	9.1	10	47	89	61	103	40
	0913-□S	9.13	10	47	89	61	103	40
	092-□S	9.2	10	47	89	61	103	40
	093-□S	9.3	10	47	89	61	103	40
	094-□S	9.4	10	47	89	61	103	40
	095-□S	9.5	10	47	89	61	103	40
	0953-□S	9.53	10	47	89	61	103	40
	096-□S	9.6	10	47	89	61	103	40
	097-□S	9.7	10	47	89	61	103	40
	098-□S	9.8	10	47	89	61	103	40
	099-□S	9.9	10	47	89	61	103	40
	0992-□S	9.92	10	47	89	61	103	40
	100-□S	10.0	10	47	89	61	103	40

MSDPH-S





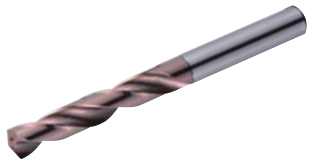
Specification	S
Grade	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
Point angle (θ°)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Internal

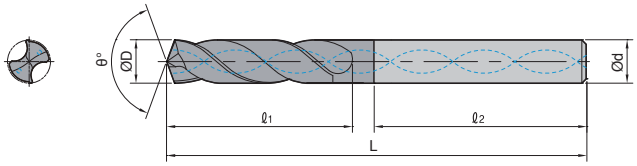
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	101-□S	10.1	12	55	102	71	118	45
	102-□S	10.2	12	55	102	71	118	45
	103-□S	10.3	12	55	102	71	118	45
	1032-□S	10.32	12	55	102	71	118	45
	104-□S	10.4	12	55	102	71	118	45
	105-□S	10.5	12	55	102	71	118	45
	106-□S	10.6	12	55	102	71	118	45
	107-□S	10.7	12	55	102	71	118	45
	1072-□S	10.72	12	55	102	71	118	45
	108-□S	10.8	12	55	102	71	118	45
	109-□S	10.9	12	55	102	71	118	45
	110-□S	11.0	12	55	102	71	118	45
	111-□S	11.1	12	55	102	71	118	45
	1111-□S	11.11	12	55	102	71	118	45
	112-□S	11.2	12	55	102	71	118	45
	113-□S	11.3	12	55	102	71	118	45
	114-□S	11.4	12	55	102	71	118	45
	115-□S	11.5	12	55	102	71	118	45
	1151-□S	11.51	12	55	102	71	118	45
	116-□S	11.6	12	55	102	71	118	45
	117-□S	11.7	12	55	102	71	118	45
	118-□S	11.8	12	55	102	71	118	45
	119-□S	11.9	12	55	102	71	118	45
	1191-□S	11.91	12	55	102	71	118	45
	120-□S	12.0	12	55	102	71	118	45
	121-□S	12.1	14	60	107	77	124	45
	122-□S	12.2	14	60	107	77	124	45
	123-□S	12.3	14	60	107	77	124	45
	124-□S	12.4	14	60	107	77	124	45
	125-□S	12.5	14	60	107	77	124	45
	126-□S	12.6	14	60	107	77	124	45
	127-□S	12.7	14	60	107	77	124	45
	128-□S	12.8	14	60	107	77	124	45
	129-□S	12.9	14	60	107	77	124	45
	130-□S	13.0	14	60	107	77	124	45
	131-□S	13.1	14	60	107	77	124	45
	132-□S	13.2	14	60	107	77	124	45
	133-□S	13.3	14	60	107	77	124	45
	134-□S	13.4	14	60	107	77	124	45
	1349-□S	13.49	14	60	107	77	124	45
	135-□S	13.5	14	60	107	77	124	45

MSDPH-S





Specification	S
Grade	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
Point angle (θ°)	140°
Twist angle	30°
Thinning	X type
International standard	DIN 6537
Shank type	DIN 6535 HA
Coolant	Internal

S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	136-□S	13.6	14	60	107	77	124	45
	137-□S	13.7	14	60	107	77	124	45
	138-□S	13.8	14	60	107	77	124	45
	139-□S	13.9	14	60	107	77	124	45
	140-□S	14.0	14	60	107	77	124	45
	141-□S	14.1	16	65	115	83	133	48
	142-□S	14.2	16	65	115	83	133	48
	1429-□S	14.29	16	65	115	83	133	48
	143-□S	14.3	16	65	115	83	133	48
	144-□S	14.4	16	65	115	83	133	48
	145-□S	14.5	16	65	115	83	133	48
	146-□S	14.6	16	65	115	83	133	48
	147-□S	14.7	16	65	115	83	133	48
	148-□S	14.8	16	65	115	83	133	48
	149-□S	14.9	16	65	115	83	133	48
	150-□S	15.0	16	65	115	83	133	48
	151-□S	15.1	16	65	115	83	133	48
	152-□S	15.2	16	65	115	83	133	48
	153-□S	15.3	16	65	115	83	133	48
	154-□S	15.4	16	65	115	83	133	48
	155-□S	15.5	16	65	115	83	133	48
	156-□S	15.6	16	65	115	83	133	48
	157-□S	15.7	16	65	115	83	133	48
	158-□S	15.8	16	65	115	83	133	48
	1587-□S	15.87	16	65	115	83	133	48
	159-□S	15.9	16	65	115	83	133	48
	160-□S	16.0	16	65	115	83	133	48

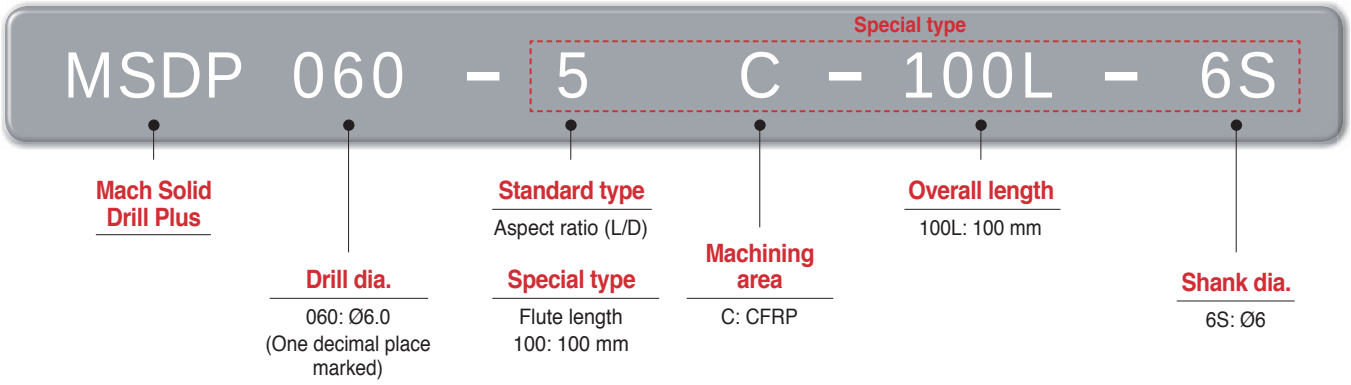
Optimized tool for hole making of CFRP

MSD Plus CFRP new

Mach Solid Drill Plus CFRP

- KORLOY's new diamond coated grade ND2110 offers excellent wear resistance
- The optimal cutting edge reduces burrs.

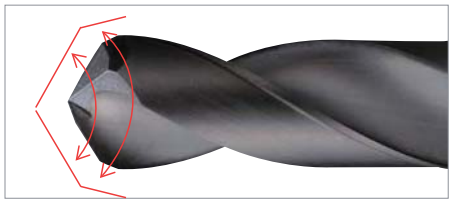
Code system



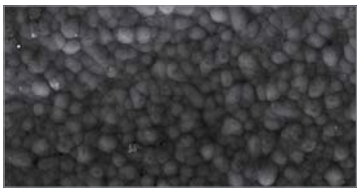
Features

- The cutting edge with a 2 step shape reduces the cutting load
- The optimal point angle of cutting edge reduces burrs
- Higher hardness of cutting edge increases wear resistance

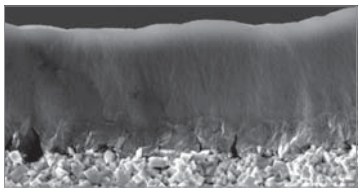
ND2110



- Diamond coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting

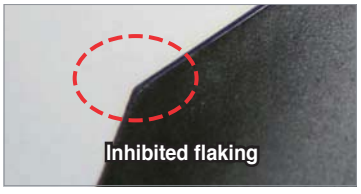


High hardness diamond coating maintains well-cut shapes



Diamond coating's strong grip to the substrate

- Inhibited burr creation by keeping cutting edges in good shape



Less wear and flaking on the rake surface

Fewer burrs on workpieces

Performance evaluation

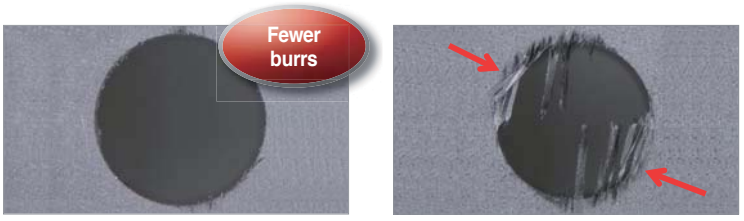
- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05, ap (mm) = 10, Air
- **Cutting length** 7.2 m (720 holes)
- **Tools** MSDP060-5C (ND2110)

Improved performance quality

MSDP-C Competitor

- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05, ap (mm) = 10, Air
- **Cutting length** 7.2 m (720 holes)
- **Tools** MSDP060-5C (ND2110)

Machinability in high quality hole making

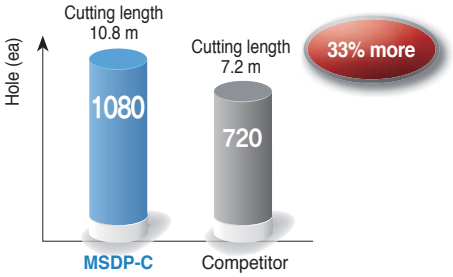


MSDP-C Competitor

Application examples

- **Use** Wing Tail
- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05 ap (mm) = 10, Air
- **Tools** MSDP060-5C (ND2110)

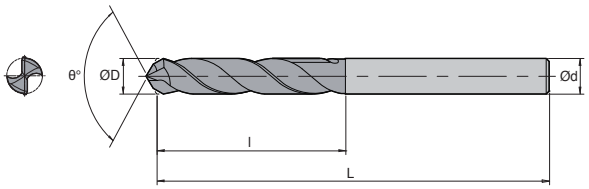
■ **Test result**



Recommended cutting conditions

Workpiece	Grade	vc (m/min)	Aspect ratio (L/D) = 5D		
			Feed rate (mm/rev) per drill dia. (mm)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2110	100 (100~150)	0.03~0.07	0.03~0.07	0.03~0.07

MSDP (5C)



Specification	C
Grade	ND2110
Tolerance (drill Dia.)	m7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

(mm)

Designation		ØD		Ød	5C	
		mm	inch		ℓ	L
MSDP	030-5C	3	-	6	28	66
	040-5C	4	-	6	36	74
	0476-5C	4.76	3/16	6	44	82
	050-5C	5	-	6	44	82
	060-5C	6	-	6	44	82
	0635-5C	6.35	1/4	8	53	91
	070-5C	7	-	8	53	91
	0794-5C	7.94	5/16	8	53	91
	080-5C	8	-	8	53	91
	090-5C	9	-	10	61	103
	0952-5C	9.52	3/8	10	61	103
	100-5C	10	-	10	61	103
	110-5C	11	-	12	71	118
	1111-5C	11.11	7/16	12	71	118
	120-5C	12	-	12	71	118
	127-5C	12.7	1/2	14	71	124

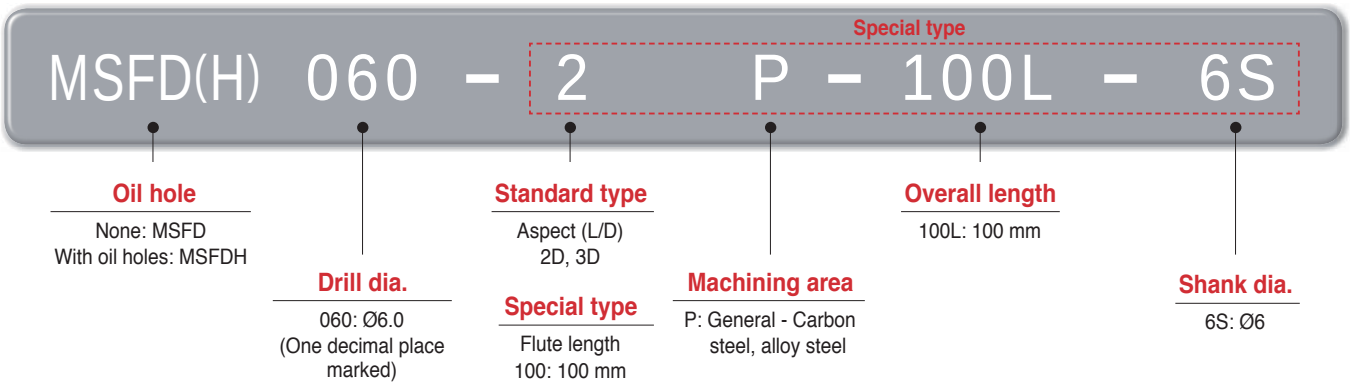
The best tool for ramped, curved or flat workpieces

MSFD new

Mach Solid Flat Drill

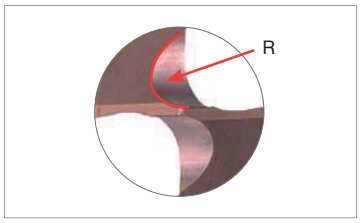
- High quality hole making capability with 180°-point angle
- Improved anti chipping and welding resistance by edge honing and chamfering
  Minimized creation of burrs compared to general drills

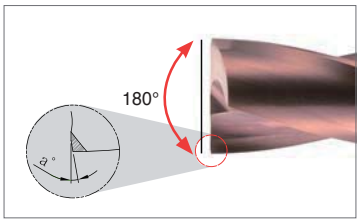
Code system



Features

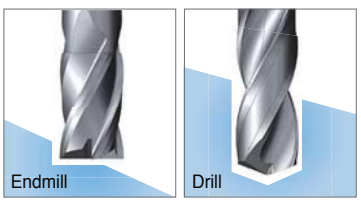
- Excellent straightness with its 180°-point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part





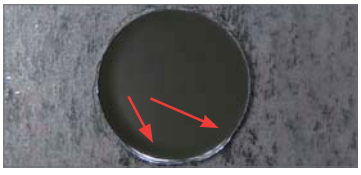
- Multi-functional capability - end milling and drilling using a single MSFD

MSFD



Conventional tools used and their application

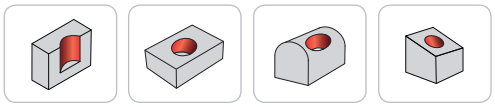
MSFD



Competitor

Wide applications

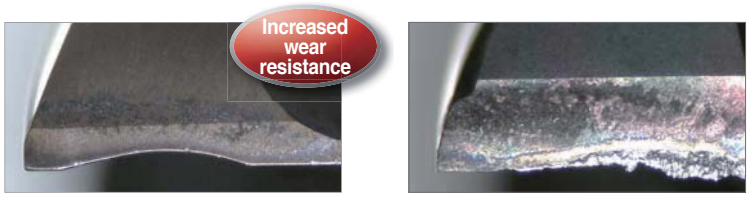
• A wide range of applications and improved cutting performance



Vertical Flat surface Curved surface Ramped

Performance evaluation

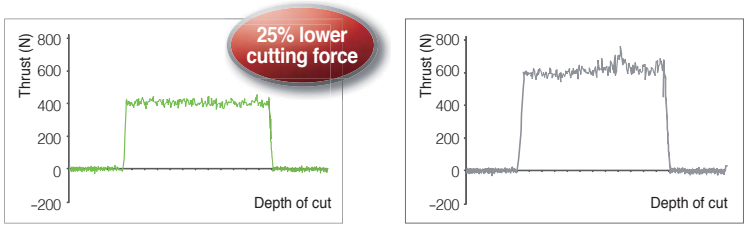
- **Workpiece** SM48C
- **Cutting conditions** vc (m/min) = 80, fn (mm/min) = 0.10, ap (mm) = 15, wet
- **Cutting length** 7.2 m (600 holes)
- **Tools** MSFD060-2P (PC325U)



MSFD
Prolongs tool life

Competitor

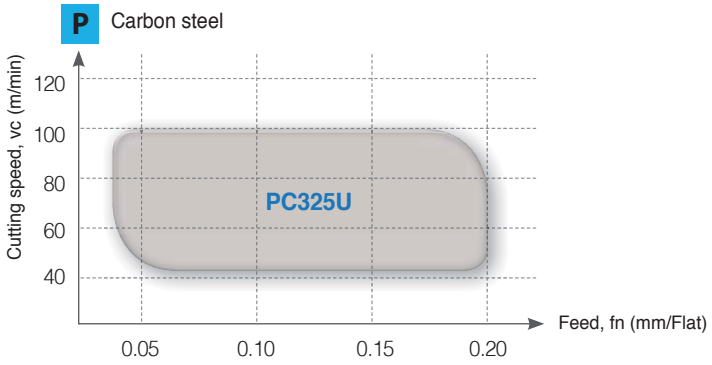
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 70, fn (mm/min) = 0.10, ap (mm) = 15, wet
- **Tools** MSFDH060-3P (PC325U)



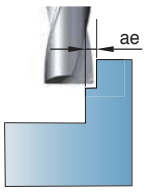
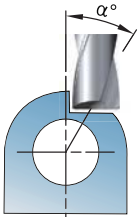
MSFD (Average thrust of 160N)
Stable hole size consistency and better surface finish

Competitor (Average thrust of 214N)

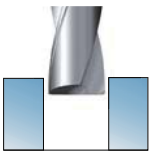
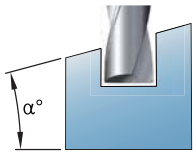
Application range



Application methods

Application type	Recommended machining conditions
	• Radial depth of cuts should be less than half the drill radius • In case of increasing depth of cuts, divide the machining process into two passes
	• Use the tool within 30° from the center of the curve • Reduce the feed rate when the tool penetrates the workpiece to the end part

Workpiece (Ø)	Slope angle (α°)	Performance	Applied (fn)
≤ Ø100	≤ 20°	◎	100%
	20°< ~40°	○	80%
	≥ 40°	△	60%

Application type	Recommended machining conditions
	• Reduce the feed rate by half the recommended condition when the tool enters the workpiece • Reduce the feed rate by half the recommended condition when the tool penetrates the workpiece to the end part • Recommended depth of cut is under 2D
	• Recommended slope angle range is under 30° • In case of machining at slope angle over 30°, reduce the feed rate when the tool enters the workpiece

Slope angle (α°)	Performance	Applied (fn)
≤ 20°	◎	100%
20°< ~40°	○	80%
≥ 40°	△	60%

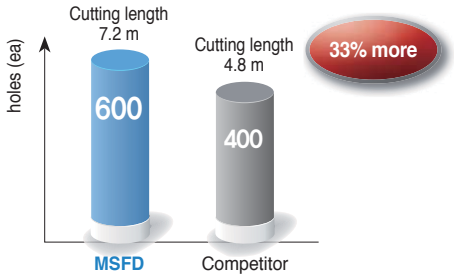
Recommended cutting conditions

Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 2D~3D Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P	Carbon steel	Low carbon steel	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
		High carbon steel	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
	Alloy steel	Low alloy steel	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
		High alloy steel	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

Application examples

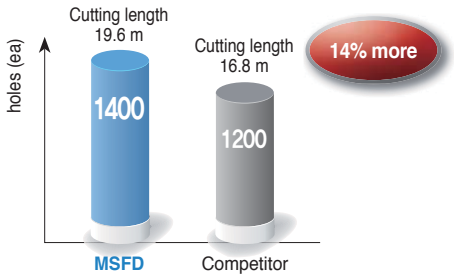
- **Workpiece** Carbon steel (SM45C)
- **Cutting conditions** vc (m/min) = 80
fn (mm/min) = 0.1
ap (mm) = 12, wet
- **Tools** MSFD060-2P (PC325U)

■ **Test result**

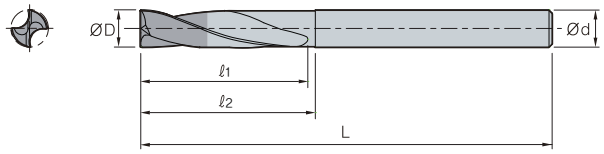


- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** vc (m/min) = 100
fn (mm/min) = 0.1
ap (mm) = 14, wet
- **Tools** MSFDH060-3P (PC325U)

■ **Test result**



MSFD (2P)



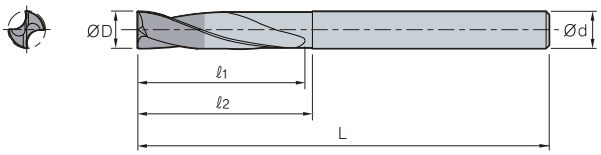
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	025-2P	2.5	4.0	10.5	11.5	50
	026-2P	2.6	4.0	10.9	11.9	50
	027-2P	2.7	4.0	11.3	12.3	50
	028-2P	2.8	4.0	11.8	12.8	50
	029-2P	2.9	4.0	12.2	13.2	50
	030-2P	3.0	6.0	12.6	13.6	50
	031-2P	3.1	6.0	13.0	14.0	50
	032-2P	3.2	6.0	13.4	14.4	50
	033-2P	3.3	6.0	13.9	14.9	50
	034-2P	3.4	6.0	14.3	15.3	50
	035-2P	3.5	6.0	14.7	15.7	50
	036-2P	3.6	6.0	15.1	16.1	50
	037-2P	3.7	6.0	15.5	16.5	50
	038-2P	3.8	6.0	16.0	17.0	50
	039-2P	3.9	6.0	16.4	17.4	50
	040-2P	4.0	6.0	16.8	17.8	50
	041-2P	4.1	6.0	17.2	18.2	60
	042-2P	4.2	6.0	17.6	18.6	60
	043-2P	4.3	6.0	18.1	19.1	60
	044-2P	4.4	6.0	18.5	19.5	60
	045-2P	4.5	6.0	18.9	19.9	60
	046-2P	4.6	6.0	19.3	20.3	60
	047-2P	4.7	6.0	19.7	20.7	60
	048-2P	4.8	6.0	20.2	21.2	60
	049-2P	4.9	6.0	20.6	21.6	60
	050-2P	5.0	6.0	21.0	22.0	60
	051-2P	5.1	6.0	21.4	22.4	60
	052-2P	5.2	6.0	21.8	22.8	60
	053-2P	5.3	6.0	22.3	23.3	60
	054-2P	5.4	6.0	22.7	23.7	60
	055-2P	5.5	6.0	23.1	24.1	60
	056-2P	5.6	6.0	23.5	24.5	60
	057-2P	5.7	6.0	23.9	24.9	60
	058-2P	5.8	6.0	24.4	25.4	60
	059-2P	5.9	6.0	24.8	25.8	60
	060-2P	6.0	6.0	25.2	26.2	60
	061-2P	6.1	8.0	25.6	26.6	70
	062-2P	6.2	8.0	26.0	27.0	70
	063-2P	6.3	8.0	26.5	27.5	70
	064-2P	6.4	8.0	26.9	27.9	70
	065-2P	6.5	8.0	27.3	28.3	70
	066-2P	6.6	8.0	27.7	28.7	70
	067-2P	6.7	8.0	28.1	29.1	70
	068-2P	6.8	8.0	28.6	29.6	70
	069-2P	6.9	8.0	29.0	30.0	70
	070-2P	7.0	8.0	29.4	30.4	70

MSFD (2P)



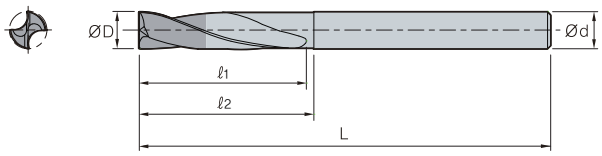
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	071-2P	7.1	8.0	29.8	30.8	70
	072-2P	7.2	8.0	30.2	31.2	70
	073-2P	7.3	8.0	30.7	31.7	70
	074-2P	7.4	8.0	31.1	32.1	70
	075-2P	7.5	8.0	31.5	32.5	70
	076-2P	7.6	8.0	31.9	32.9	70
	077-2P	7.7	8.0	32.3	33.3	70
	078-2P	7.8	8.0	32.8	33.8	70
	079-2P	7.9	8.0	33.2	34.2	70
	080-2P	8.0	8.0	33.6	34.6	70
	081-2P	8.1	10.0	34.0	35.0	80
	082-2P	8.2	10.0	34.4	35.4	80
	083-2P	8.3	10.0	34.9	35.9	80
	084-2P	8.4	10.0	35.3	36.3	80
	085-2P	8.5	10.0	35.7	36.7	80
	086-2P	8.6	10.0	36.1	37.1	80
	087-2P	8.7	10.0	36.5	37.5	80
	088-2P	8.8	10.0	37.0	38.0	80
	089-2P	8.9	10.0	37.4	38.4	80
	090-2P	9.0	10.0	37.8	38.8	80
	091-2P	9.1	10.0	38.2	39.2	80
	092-2P	9.2	10.0	38.6	39.6	80
	093-2P	9.3	10.0	39.1	40.1	80
	094-2P	9.4	10.0	39.5	40.5	80
	095-2P	9.5	10.0	39.9	40.9	80
	096-2P	9.6	10.0	40.3	41.3	80
	097-2P	9.7	10.0	40.7	41.7	80
	098-2P	9.8	10.0	41.2	42.2	80
	099-2P	9.9	10.0	41.6	42.6	80
	100-2P	10.0	10.0	42.0	43	80
	101-2P	10.1	12.0	42.4	43.4	90
	102-2P	10.2	12.0	42.8	43.8	90
	103-2P	10.3	12.0	43.3	44.3	90
	104-2P	10.4	12.0	43.7	44.7	90
	105-2P	10.5	12.0	44.1	45.1	90
	106-2P	10.6	12.0	44.5	45.5	90
	107-2P	10.7	12.0	44.9	45.9	90
	108-2P	10.8	12.0	45.4	46.4	90
	109-2P	10.9	12.0	45.8	46.8	90
	110-2P	11.0	12.0	46.2	47.2	90
	111-2P	11.1	12.0	46.6	47.6	90
	112-2P	11.2	12.0	47.0	48.0	90
	113-2P	11.3	12.0	47.5	48.5	90
	114-2P	11.4	12.0	47.9	48.9	90
	115-2P	11.5	12.0	48.3	49.3	90
	116-2P	11.6	12.0	48.7	49.7	90
	117-2P	11.7	12.0	49.1	50.1	90
	118-2P	11.8	12.0	49.6	50.6	90
	119-2P	11.9	12.0	50.0	51.0	90
	120-2P	12.0	12.0	50.4	51.4	90

MSFD (2P)



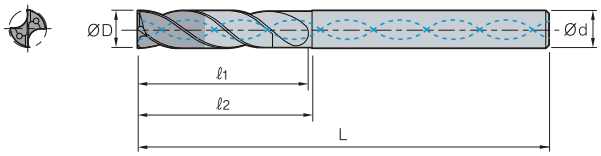
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	121-2P	12.1	14.0	50.8	51.8	100
	122-2P	12.2	14.0	51.2	52.2	100
	123-2P	12.3	14.0	51.7	52.7	100
	124-2P	12.4	14.0	52.1	53.1	100
	125-2P	12.5	14.0	52.5	53.5	100
	126-2P	12.6	14.0	52.9	53.9	100
	127-2P	12.7	14.0	53.3	54.3	100
	128-2P	12.8	14.0	53.8	54.8	100
	129-2P	12.9	14.0	54.2	55.2	100
	130-2P	13.0	14.0	54.6	55.6	100
	131-2P	13.1	14.0	55.0	56.0	100
	132-2P	13.2	14.0	55.4	56.4	100
	133-2P	13.3	14.0	55.9	56.9	100
	134-2P	13.4	14.0	56.3	57.3	100
	135-2P	13.5	14.0	56.7	57.7	110
	136-2P	13.6	14.0	57.1	58.1	110
	137-2P	13.7	14.0	57.5	58.5	110
	138-2P	13.8	14.0	58.0	59.0	110
	139-2P	13.9	14.0	58.4	59.4	110
	140-2P	14.0	14.0	58.8	59.8	110
	141-2P	14.1	16.0	59.2	60.2	110
	142-2P	14.2	16.0	59.6	60.6	110
	143-2P	14.3	16.0	60.1	61.1	110
	144-2P	14.4	16.0	60.5	61.5	110
	145-2P	14.5	16.0	60.9	61.9	110
	146-2P	14.6	16.0	61.3	62.3	110
	147-2P	14.7	16.0	61.7	62.7	110
	148-2P	14.8	16.0	62.2	63.2	110
	149-2P	14.9	16.0	62.6	63.6	110
	150-2P	15.0	16.0	63.0	64.0	110
	151-2P	15.1	16.0	65.0	66.0	115
	152-2P	15.2	16.0	65.0	66.0	115
	153-2P	15.3	16.0	65.1	66.1	115
	154-2P	15.4	16.0	65.1	66.1	115
	155-2P	15.5	16.0	65.1	66.1	115
	156-2P	15.6	16.0	67.1	68.1	115
	157-2P	15.7	16.0	67.1	68.1	115
	158-2P	15.8	16.0	67.2	68.2	115
	159-2P	15.9	16.0	67.2	68.2	115
	160-2P	16.0	16.0	67.2	68.2	115

MSFDH (3P)



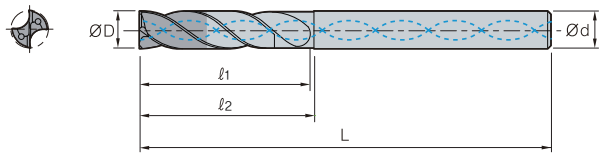
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	025-3P	2.5	3.0	17	18	58
	026-3P	2.6	3.0	17	18	58
	027-3P	2.7	3.0	17	18	58
	028-3P	2.8	3.0	17	18	58
	029-3P	2.9	3.0	17	18	58
	030-3P	3.0	6.0	20	21	62
	031-3P	3.1	6.0	20	21	62
	032-3P	3.2	6.0	20	21	62
	033-3P	3.3	6.0	20	21	62
	034-3P	3.4	6.0	20	21	62
	035-3P	3.5	6.0	20	21	62
	036-3P	3.6	6.0	20	21	62
	037-3P	3.7	6.0	20	21	62
	038-3P	3.8	6.0	24	25	66
	039-3P	3.9	6.0	24	25	66
	040-3P	4.0	6.0	24	25	66
	041-3P	4.1	6.0	24	25	66
	042-3P	4.2	6.0	24	25	66
	043-3P	4.3	6.0	24	25	66
	044-3P	4.4	6.0	24	25	66
	045-3P	4.5	6.0	24	25	66
	046-3P	4.6	6.0	24	25	66
	047-3P	4.7	6.0	24	25	66
	048-3P	4.8	6.0	28	29	66
	049-3P	4.9	6.0	28	29	66
	050-3P	5.0	6.0	28	29	66
	051-3P	5.1	6.0	28	29	66
	052-3P	5.2	6.0	28	29	66
	053-3P	5.3	6.0	28	29	66
	054-3P	5.4	6.0	28	29	66
	055-3P	5.5	6.0	28	29	66
	056-3P	5.6	6.0	28	29	66
	057-3P	5.7	6.0	28	29	66
	058-3P	5.8	6.0	28	29	66
	059-3P	5.9	6.0	28	29	66
	060-3P	6.0	6.0	28	29	66
	061-3P	6.1	8.0	34	35	79
	062-3P	6.2	8.0	34	35	79
	063-3P	6.3	8.0	34	35	79
	064-3P	6.4	8.0	34	35	79
	065-3P	6.5	8.0	34	35	79
	066-3P	6.6	8.0	34	35	79
	067-3P	6.7	8.0	34	35	79
	068-3P	6.8	8.0	34	35	79
	069-3P	6.9	8.0	34	35	79
	070-3P	7.0	8.0	34	35	79

MSFDH (3P)



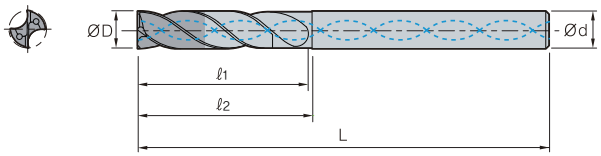
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	071-3P	7.1	8.0	41	42	79
	072-3P	7.2	8.0	41	42	79
	073-3P	7.3	8.0	41	42	79
	074-3P	7.4	8.0	41	42	79
	075-3P	7.5	8.0	41	42	79
	076-3P	7.6	8.0	41	42	79
	077-3P	7.7	8.0	41	42	79
	078-3P	7.8	8.0	41	42	79
	079-3P	7.9	8.0	41	42	79
	080-3P	8.0	8.0	41	42	79
	081-3P	8.1	10.0	47	48	89
	082-3P	8.2	10.0	47	48	89
	083-3P	8.3	10.0	47	48	89
	084-3P	8.4	10.0	47	48	89
	085-3P	8.5	10.0	47	48	89
	086-3P	8.6	10.0	47	48	89
	087-3P	8.7	10.0	47	48	89
	088-3P	8.8	10.0	47	48	89
	089-3P	8.9	10.0	47	48	89
	090-3P	9.0	10.0	47	48	89
	091-3P	9.1	10.0	47	48	89
	092-3P	9.2	10.0	47	48	89
	093-3P	9.3	10.0	47	48	89
	094-3P	9.4	10.0	47	48	89
	095-3P	9.5	10.0	47	48	89
	096-3P	9.6	10.0	47	48	89
	097-3P	9.7	10.0	47	48	89
	098-3P	9.8	10.0	47	48	89
	099-3P	9.9	10.0	47	48	89
	100-3P	10.0	10.0	47	48	89
	101-3P	10.1	12.0	55	56	102
	102-3P	10.2	12.0	55	56	102
	103-3P	10.3	12.0	55	56	102
	104-3P	10.4	12.0	55	56	102
	105-3P	10.5	12.0	55	56	102
	106-3P	10.6	12.0	55	56	102
	107-3P	10.7	12.0	55	56	102
	108-3P	10.8	12.0	55	56	102
	109-3P	10.9	12.0	55	56	102
	110-3P	11.0	12.0	55	56	102
	111-3P	11.1	12.0	55	56	102
	112-3P	11.2	12.0	55	56	102
	113-3P	11.3	12.0	55	56	102
	114-3P	11.4	12.0	55	56	102
	115-3P	11.5	12.0	55	56	102
	116-3P	11.6	12.0	55	56	102
	117-3P	11.7	12.0	55	56	102
	118-3P	11.8	12.0	55	56	102
	119-3P	11.9	12.0	55	56	102
	120-3P	12.0	12.0	55	56	102

MSFDH (3P)



Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

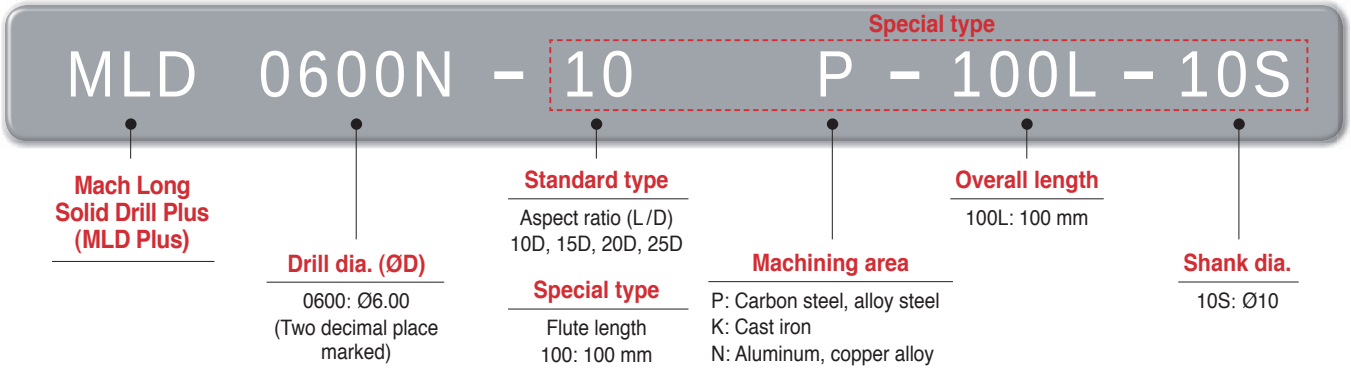
Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	121-3P	12.1	14.0	60	61	107
	122-3P	12.2	14.0	60	61	107
	123-3P	12.3	14.0	60	61	107
	124-3P	12.4	14.0	60	61	107
	125-3P	12.5	14.0	60	61	107
	126-3P	12.6	14.0	60	61	107
	127-3P	12.7	14.0	60	61	107
	128-3P	12.8	14.0	60	61	107
	129-3P	12.9	14.0	60	61	107
	130-3P	13.0	14.0	60	61	107
	131-3P	13.1	14.0	60	61	107
	132-3P	13.2	14.0	60	61	107
	133-3P	13.3	14.0	60	61	107
	134-3P	13.4	14.0	60	61	107
	135-3P	13.5	14.0	60	61	107
	136-3P	13.6	14.0	60	61	107
	137-3P	13.7	14.0	60	61	107
	138-3P	13.8	14.0	60	61	107
	139-3P	13.9	14.0	60	61	107
	140-3P	14.0	14.0	60	61	107
	141-3P	14.1	16.0	65	66	115
	142-3P	14.2	16.0	65	66	115
	143-3P	14.3	16.0	65	66	115
	144-3P	14.4	16.0	65	66	115
	145-3P	14.5	16.0	65	66	115
	146-3P	14.6	16.0	65	66	115
	147-3P	14.7	16.0	65	66	115
	148-3P	14.8	16.0	65	66	115
	149-3P	14.9	16.0	65	66	115
	150-3P	15.0	16.0	65	66	115
	151-3P	15.1	16.0	65	66	115
	152-3P	15.2	16.0	65	66	115
	153-3P	15.3	16.0	65	66	115
	154-3P	15.4	16.0	65	66	115
	155-3P	15.5	16.0	65	66	115
	156-3P	15.6	16.0	65	66	115
	157-3P	15.7	16.0	65	66	115
	158-3P	15.8	16.0	65	66	115
	159-3P	15.9	16.0	65	66	115
	160-3P	16.0	16.0	65	66	115

The most optimized tool for high precision and quality on hole making process

MLD Plus new

Mach Long Solid Drill Plus

Code system

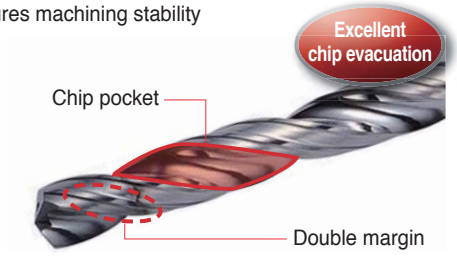


Features

Cutting edge and flute shape

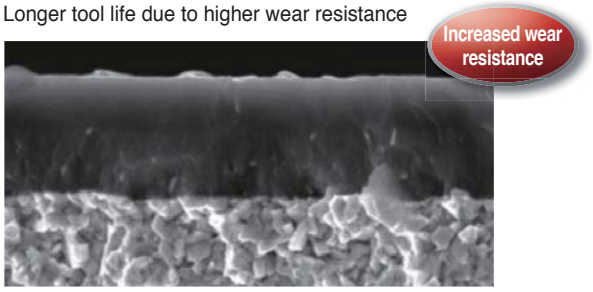
- Straight cutting edge provides better rigidity
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability

Cutting edge shape



New grade (PC315G)

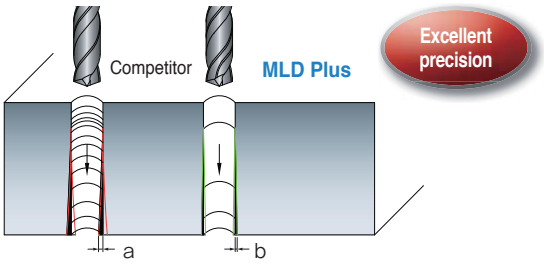
- Ultra-fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance
- Longer tool life due to higher wear resistance



PC315G

Machining accuracy

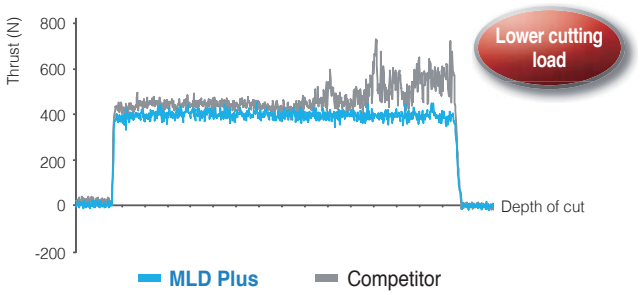
- Improved machining precision
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- Improved point shape
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

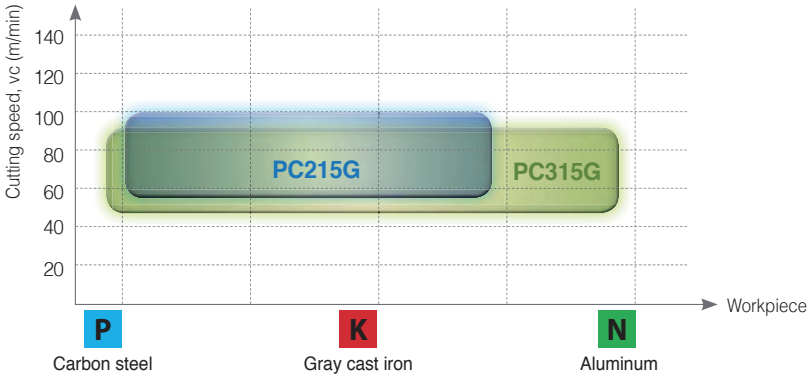
Cutting load

- **Workpiece** SM45C
- **Cutting conditions** Drill Dia.(m) = Ø6.0, vc (m/min) = 70
  fn (mm/rev) = 0.12, ap (mm) = 60, wet
- **Tools** MLD0600N-20P



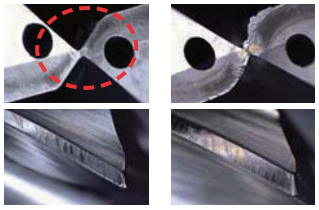
Application area

- **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed

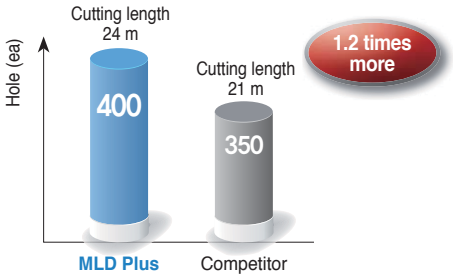


Application examples

- **Use** Part of Automobile
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 70, fn (mm/rev) = 0.12, ap (mm) = 60, Through coolant
- **Tools** MLD0400N-20P (PC315G)



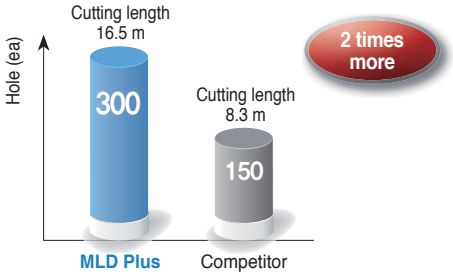
Test result



New grade PC315G's coating layer has been applied to improve wear resistance when machining carbon steel materials

- **Use** Part of Automobile
- **Workpiece** SCM440H
- **Cutting conditions** vc (m/min) = 70, fn (mm/rev) = 0.12, ap (mm) = 55, Through coolant
- **Tools** MLD0507N-15P (PC315G)

Test result

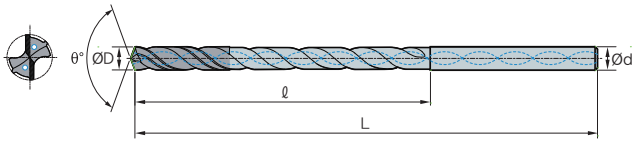


Double margin has been applied to improve stability and machining precision

Recommended cutting condition

Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 10D~25D		
						Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB	Recommended		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P	Carbon steel	Low carbon steel	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
		High carbon steel	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
	Alloy steel	Low alloy steel	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
		Low carbon steel	50~260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K	Cast iron	Gray cast iron	150~230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
		Ductile cast iron	160~260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N	Aluminum	Aluminum alloy	30~150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
	Copper alloy	Copper alloy	150~160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

MLD-□□(P/K/N)



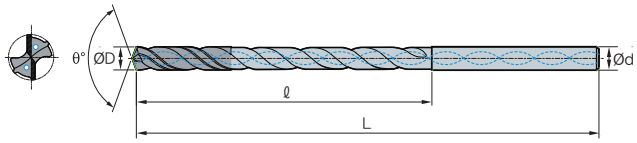
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0300N-□□P,K,N	3.0	3.0	40	90	55	105	70	120	-	-
	0310N-□□P,K,N	3.1	4.0	45	100	60	125	80	140	-	-
	0320N-□□P,K,N	3.2	4.0	45	100	60	125	80	140	-	-
	0330N-□□P,K,N	3.3	4.0	45	100	60	125	80	140	-	-
	0340N-□□P,K,N	3.4	4.0	50	100	65	125	85	140	-	-
	0350N-□□P,K,N	3.5	4.0	50	100	65	125	85	140	-	-
	0360N-□□P,K,N	3.6	4.0	50	100	65	125	85	140	-	-
	0370N-□□P,K,N	3.7	4.0	50	100	65	125	85	140	-	-
	0380N-□□P,K,N	3.8	4.0	50	100	75	125	90	140	-	-
	0390N-□□P,K,N	3.9	4.0	50	100	75	125	90	140	-	-
	0400N-□□P,K,N	4.0	4.0	50	100	75	125	90	140	115	165
	0410N-□□P,K,N	4.1	5.0	55	115	75	140	100	165	120	190
	0420N-□□P,K,N	4.2	5.0	55	115	75	140	100	165	120	190
	0430N-□□P,K,N	4.3	5.0	60	115	85	140	110	165	135	190
	0440N-□□P,K,N	4.4	5.0	60	115	85	140	110	165	135	190
	0450N-□□P,K,N	4.5	5.0	60	115	85	140	110	165	135	190
	0460N-□□P,K,N	4.6	5.0	60	115	85	140	110	165	135	190
	0470N-□□P,K,N	4.7	5.0	60	115	85	140	110	165	135	190
	0480N-□□P,K,N	4.8	5.0	65	115	90	140	115	165	140	190
	0490N-□□P,K,N	4.9	5.0	65	115	90	140	115	165	140	190

MLD-□□(P/K/N)



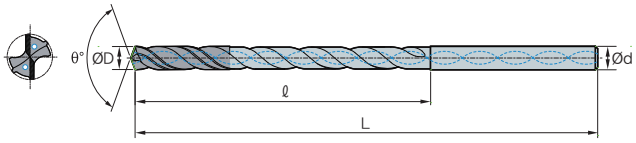
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0500N-□□P,K,N	5.0	5.0	65	115	90	140	115	165	140	190
	0510N-□□P,K,N	5.1	6.0	70	128	95	160	120	190	150	220
	0520N-□□P,K,N	5.2	6.0	70	128	95	160	120	190	150	220
	0530N-□□P,K,N	5.3	6.0	70	128	95	160	120	190	150	220
	0540N-□□P,K,N	5.4	6.0	78	128	110	160	140	190	170	220
	0550N-□□P,K,N	5.5	6.0	78	128	110	160	140	190	170	220
	0560N-□□P,K,N	5.6	6.0	78	128	110	160	140	190	170	220
	0570N-□□P,K,N	5.7	6.0	78	128	110	160	140	190	170	220
	0580N-□□P,K,N	5.8	6.0	78	128	110	160	140	190	170	220
	0590N-□□P,K,N	5.9	6.0	78	128	110	160	140	190	170	220
	0600N-□□P,K,N	6.0	6.0	78	128	110	160	140	190	170	220
	0610N-□□P,K,N	6.1	7.0	87	140	120	175	155	210	190	250
	0620N-□□P,K,N	6.2	7.0	87	140	120	175	155	210	190	250
	0630N-□□P,K,N	6.3	7.0	87	140	120	175	155	210	190	250
	0640N-□□P,K,N	6.4	7.0	87	140	120	175	155	210	190	250
	0650N-□□P,K,N	6.5	7.0	87	140	120	175	155	210	190	250
	0660N-□□P,K,N	6.6	7.0	87	140	120	175	155	210	190	250
	0670N-□□P,K,N	6.7	7.0	87	140	120	175	155	210	190	250
	0680N-□□P,K,N	6.8	7.0	90	140	125	175	160	210	200	250
	0690N-□□P,K,N	6.9	7.0	90	140	125	175	160	210	200	250

MLD-□□(P/K/N)



Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

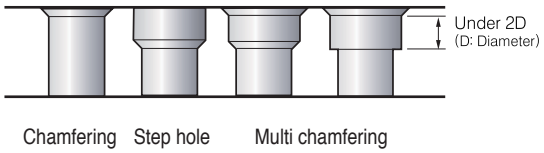
P Steel K Cast iron N Non-ferrous metal

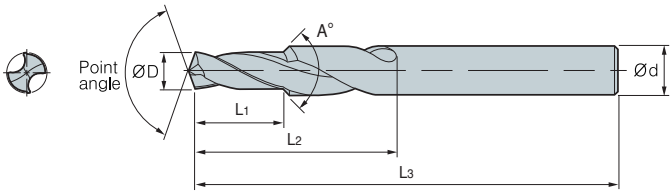
(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0700N-□□P,K,N	7.0	7.0	90	140	125	175	160	210	200	250
	0710N-□□P,K,N	7.1	8.0	100	155	135	195	170	230	-	-
	0720N-□□P,K,N	7.2	8.0	100	155	135	195	170	230	-	-
	0730N-□□P,K,N	7.3	8.0	100	155	135	195	170	230	-	-
	0740N-□□P,K,N	7.4	8.0	100	155	135	195	170	230	-	-
	0750N-□□P,K,N	7.5	8.0	100	155	135	195	170	230	-	-
	0760N-□□P,K,N	7.6	8.0	105	155	145	195	180	230	-	-
	0770N-□□P,K,N	7.7	8.0	105	155	145	195	180	230	-	-
	0780N-□□P,K,N	7.8	8.0	105	155	145	195	180	230	-	-
	0790N-□□P,K,N	7.9	8.0	105	155	145	195	180	230	-	-
	0800N-□□P,K,N	8.0	8.0	105	155	145	195	180	230	-	-
	0810N-□□P,K,N	8.1	9.0	110	165	155	210	195	260	-	-
	0820N-□□P,K,N	8.2	9.0	110	165	155	210	195	260	-	-
	0830N-□□P,K,N	8.3	9.0	110	165	155	210	195	260	-	-
	0840N-□□P,K,N	8.4	9.0	110	165	155	210	195	260	-	-
	0850N-□□P,K,N	8.5	9.0	110	165	155	210	195	260	-	-
	0860N-□□P,K,N	8.6	9.0	115	165	160	210	210	260	-	-
	0870N-□□P,K,N	8.7	9.0	115	165	160	210	210	260	-	-
	0880N-□□P,K,N	8.8	9.0	115	165	160	210	210	260	-	-
	0890N-□□P,K,N	8.9	9.0	115	165	160	210	210	260	-	-
	0900N-□□P,K,N	9.0	9.0	115	165	160	210	210	260	-	-
	0910N-□□P,K,N	9.1	10.0	125	190	170	240	-	-	-	-
	0920N-□□P,K,N	9.2	10.0	125	190	170	240	-	-	-	-
	0930N-□□P,K,N	9.3	10.0	125	190	170	240	-	-	-	-
	0940N-□□P,K,N	9.4	10.0	125	190	170	240	-	-	-	-
	0950N-□□P,K,N	9.5	10.0	125	190	170	240	-	-	-	-
	0960N-□□P,K,N	9.6	10.0	130	190	180	240	-	-	-	-
	0970N-□□P,K,N	9.7	10.0	130	190	180	240	-	-	-	-
	0980N-□□P,K,N	9.8	10.0	130	190	180	240	-	-	-	-
	0990N-□□P,K,N	9.9	10.0	130	190	180	240	-	-	-	-
	1000N-□□P,K,N	10.0	10.0	130	190	180	240	-	-	-	-

Code system for mach step drill

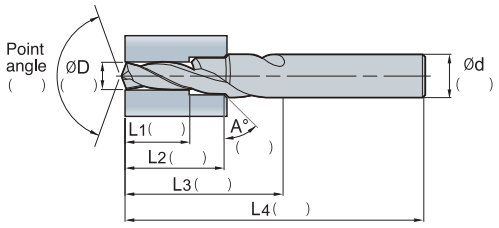
MSDP(H)S	Tool Dia.	–	Effective flute length	–	Flute length	–	Overall length (L)	–	Shank Dia. (S)
Solid type: MSDPS Oil-hole type: MSDHS	ØD		L_1		L_2		L_3		(Ød)S





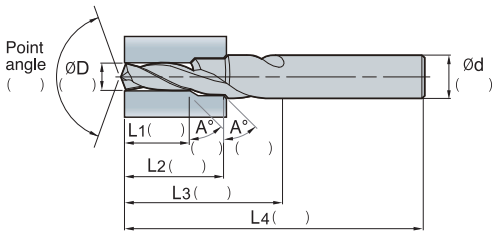
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



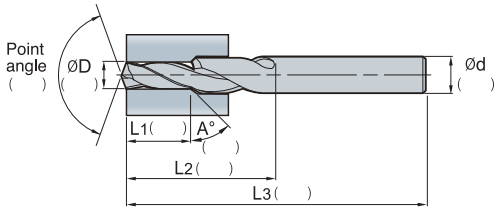
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



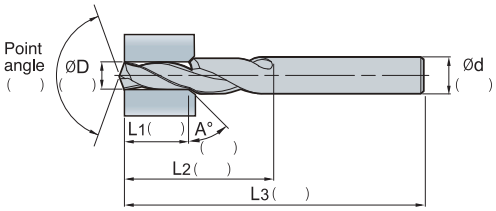
☐ Step hole

(**Coolant**: Through system ☐ External system ☐)



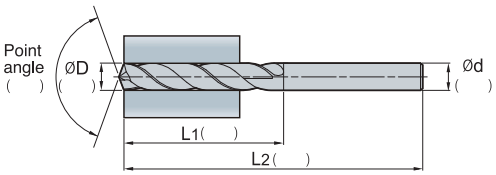
☐ Chamfering

(**Coolant**: Through system ☐ External system ☐)



☐ Drilling

(**Coolant**: Through system ☐ External system ☐)

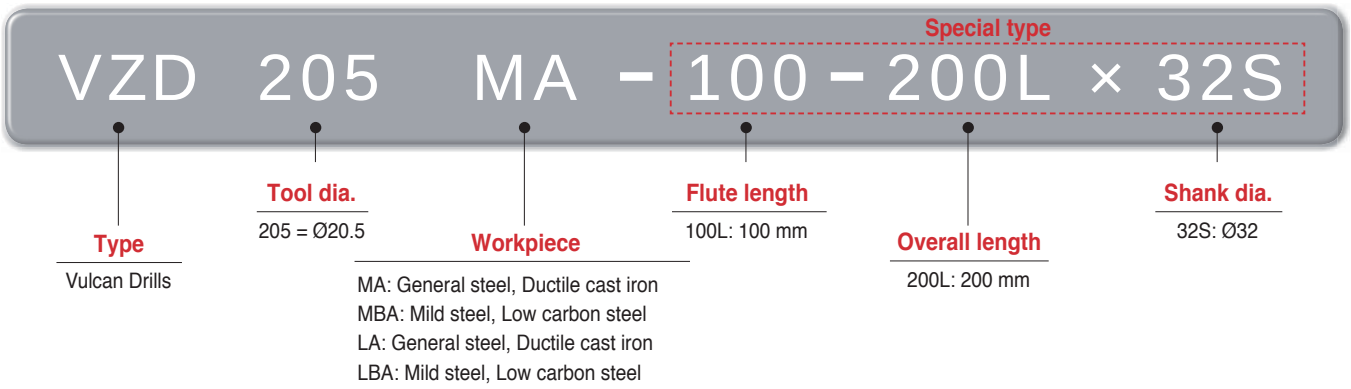


High feed and precision machining with our specially designed point edge

Vulcan Drill

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining

Code system



Application for vulcan drill

• General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc

Notice

• **Unsuitable drilling**

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1~0.15 mm/rev when drilling at inclined and unevenness

• **Clamping of workpiece**

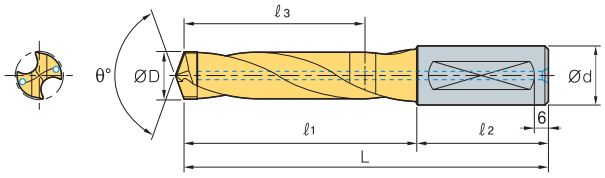
- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

Recommended cutting condition

Form	Workpiece	Hardness	~Ø15		~Ø20		~Ø40	
			vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
MA LA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (65)	0.15~0.30 (0.20)	40~90 (65)	0.20~0.40 (0.30)	40~90 (70)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	40~90 (60)	0.10~0.25 (0.20)	40~90 (60)	0.15~0.35 (0.25)	40~90 (65)	0.20~0.40 (0.30)
	Mold steel	HB250	40~70 (50)	0.10~0.25 (0.20)	40~70 (50)	0.15~0.30 (0.25)	40~70 (50)	0.20~0.35 (0.30)
	Stainless steel	HB250	30~50 (45)	0.10~0.20 (0.15)	30~50 (45)	0.15~0.25 (0.20)	30~50 (45)	0.20~0.30 (0.25)
	Ductile cast iron	-	50~100 (70)	0.20~0.35 (0.30)	50~100 (70)	0.20~0.40 (0.35)	50~100 (70)	0.25~0.50 (0.40)
MBA LBA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (75)	0.20~0.40 (0.30)	40~90 (75)	0.20~0.40 (0.30)	40~90 (80)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	35~80 (55)	0.15~0.30 (0.25)	35~80 (55)	0.15~0.30 (0.25)	40~80 (60)	0.15~0.40 (0.30)

Vulcan Drill (VZD-MA, MBA)

Type	MA	MBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135MA, MBA	12.6~13.5	16	110	62	48	44
	136~145MA, MBA	13.6~14.5	16	115	67	48	48
	146~155MA, MBA	14.6~15.5	20	125	75	50	55
	156~165MA, MBA	15.6~16.5	20	130	80	50	59
	166~175MA, MBA	16.6~17.5	20	135	85	50	63
	176~185MA, MBA	17.6~18.5	20	140	90	50	66
	186~195MA, MBA	18.6~19.5	25	155	99	56	74
	196~205MA, MBA	19.6~20.5	25	155	99	56	73
	206~215MA, MBA	20.6~21.5	25	155	99	56	72
	216~225MA, MBA	21.6~22.5	25	160	104	56	76
	226~235MA, MBA	22.6~23.5	25	160	104	56	74
	236~245MA, MBA	23.6~24.5	32	170	110	60	79
	246~255MA, MBA	24.6~25.5	32	170	110	60	78
	256~265MA, MBA	25.6~26.5	32	175	115	60	82
	266~275MA, MBA	26.6~27.5	32	175	115	60	80
	276~285MA, MBA	27.6~28.5	32	180	120	60	84
	286~295MA, MBA	28.6~29.5	32	185	125	60	88
	296~305MA, MBA	29.6~30.5	32	185	125	60	87
	306~315MA, MBA	30.6~31.5	40	205	135	70	95
	316~325MA, MBA	31.6~32.5	40	210	140	70	98
	326~335MA, MBA	32.6~33.5	40	215	145	70	101
	336~345MA, MBA	33.6~34.5	40	220	150	70	104
	346~355MA, MBA	34.6~35.5	40	225	155	70	107
	356~365MA, MBA	35.6~36.5	40	225	155	70	110
	366~375MA, MBA	36.6~37.5	40	230	160	70	113
	376~385MA, MBA	37.6~38.5	40	235	165	70	116
	386~395MA, MBA	38.6~39.5	40	240	170	70	119
	396~405MA, MBA	39.6~40.5	40	245	175	70	122

※ VZD□□□MA: For General steel, Ductile cast iron
MBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□M□-Flute length-Total length L

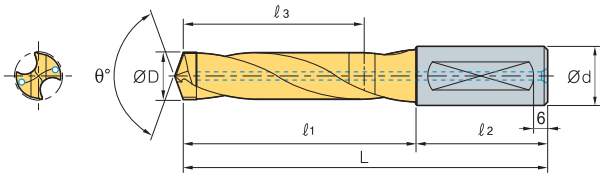
Ex.1) MA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186MA × 110-200L

Ex.2) MA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863MA × 110-200L

Ex.3) MA Type, Machined diameter: Ø18.6, Standard
--- VZD186MA

Vulcan Drill (VZD-LA, LBA)

Type	LA	LBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135LA, LBA	12.6~13.5	16	140	92	48	74
	136~145LA, LBA	13.6~14.5	16	145	97	48	78
	146~155LA, LBA	14.6~15.5	20	155	105	50	85
	156~165LA, LBA	15.6~16.5	20	165	115	50	94
	166~175LA, LBA	16.6~17.5	20	170	120	50	98
	176~185LA, LBA	17.6~18.5	20	175	125	50	101
	186~195LA, LBA	18.6~19.5	25	190	134	56	109
	196~205LA, LBA	19.6~20.5	25	195	139	56	113
	206~215LA, LBA	20.6~21.5	25	195	139	56	112
	216~225LA, LBA	21.6~22.5	25	200	144	56	116
	226~235LA, LBA	22.6~23.5	25	210	154	56	124
	236~245LA, LBA	23.6~24.5	32	220	160	60	129
	246~255LA, LBA	24.6~25.5	32	225	165	60	133
	256~265LA, LBA	25.6~26.5	32	230	170	60	137
	266~275LA, LBA	26.6~27.5	32	235	175	60	141
	276~285LA, LBA	27.6~28.5	32	240	180	60	144
	286~295LA, LBA	28.6~29.5	32	245	185	60	148
	296~305LA, LBA	29.6~30.5	32	255	195	60	157
	306~315LA, LBA	30.6~31.5	40	275	205	70	166
	316~325LA, LBA	31.6~32.5	40	280	210	70	172
	326~335LA, LBA	32.6~33.5	40	280	215	70	173
	336~345LA, LBA	33.6~34.5	40	290	220	70	177
	346~355LA, LBA	34.6~35.5	40	295	225	70	181
	356~365LA, LBA	35.6~36.5	40	300	230	70	183
	366~375LA, LBA	36.6~37.5	40	305	235	70	188
	376~385LA, LBA	37.6~38.5	40	315	245	70	193
	386~395LA, LBA	38.6~39.5	40	320	250	70	198
	396~405LA, LBA	39.6~40.5	40	325	255	70	203

※ VZD□□□LA: For General steel, Ductile cast iron
LBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□L□-Flute length-Total length L

Ex.1) LA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186LA × 110-200L

Ex.2) LA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863LA × 110-200L

Ex.3) LA Type, Machined diameter: Ø18.6, Standard
--- VZD186LA

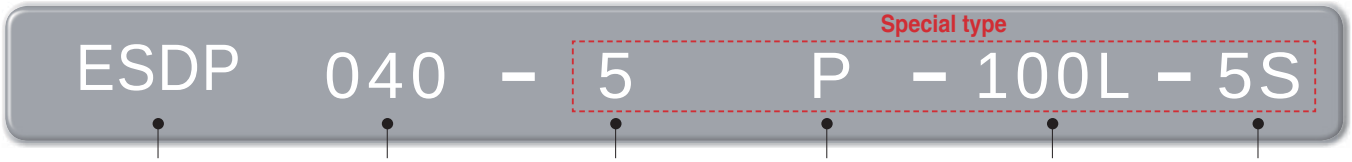
Economical Solid Drill

ESD Plus new

Eco Solid Drill Plus

- Great Value for Budget - Excellent performance and cost efficiency
- Increased Wear Resistance - Strong wear resistance due to our new PC325U grade

Code system

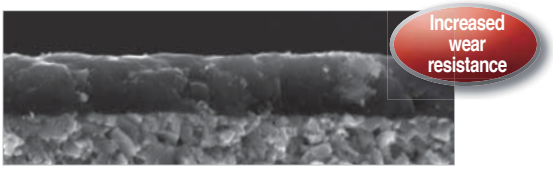


Eco Solid Drill Plus	Drill dia. (ØD)	Standard type	Machining area	Overall length	Shank Dia.
	040: Ø4.0	Aspect ratio (L/D) 3D, 5D **Special type** Flute length 100: 100 mm	P: Carbon steel, alloy steel M: Stainless steel K: Cast iron N: Aluminum, copper alloy	100L: 100 mm	5S: Ø5

Features

New grade (PC325U)

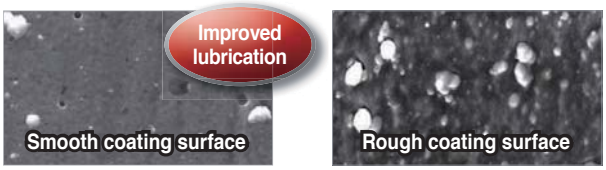
- Lubricative coating layer improves welding resistance at middle to high speed
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

- Excellent welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



PC325U Competitor

Chip control

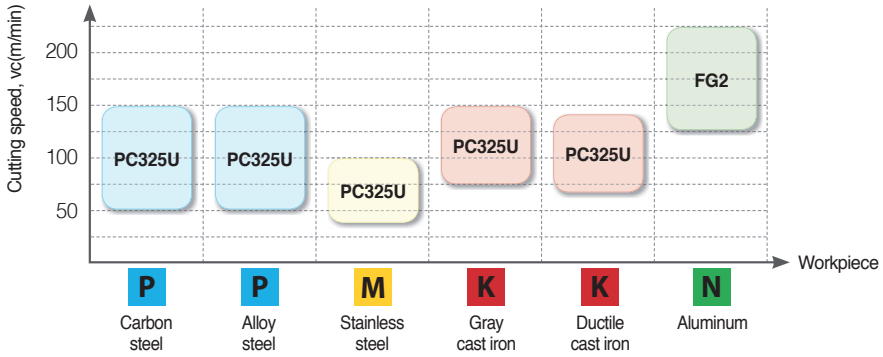
- **Workpiece** SCM440
- **Cutting conditions** vc (m/min) = 40, fn (mm/rev) = 0.1, ap (mm) = 30, wet
- **Tools** ESDP060-5P

ESD Plus Competitor

Flute shape

- Improved chip evacuation due to wider chip pocket

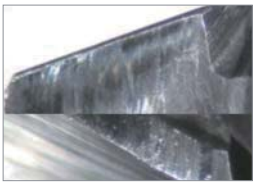
Application area



Performance evaluation

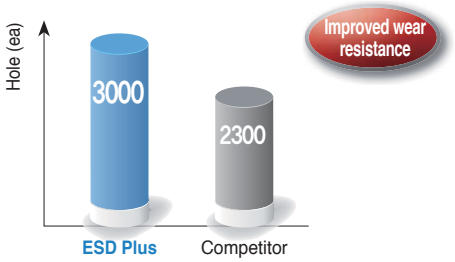
- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** vc (m/min) = 95
  fn (mm/rev) = 0.12, ap (mm) = 20, External coolant
- **Tools** ESDP060-5P

ESD Plus



Competitor

■ **Test result**

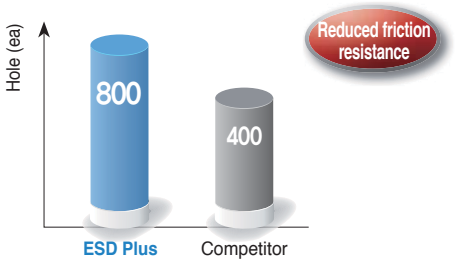


Lubricative coating layer of the new grade PC325U maximizes wear resistance

Application examples

- **Workpiece** Carbon steel (SM45C)
- **Cutting conditions** vc (m/min) = 50
  fn (mm/rev) = 0.08, ap (mm) = 23.5, External coolant
- **Tools** ESDP090-5P

■ **Test result**



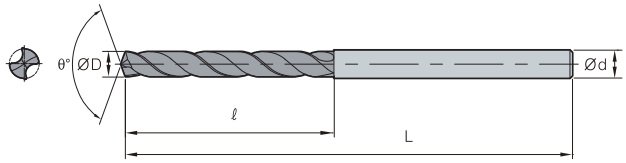
Special treatment on coating surface minimizes frictional resistance

Recommended cutting condition

Workpiece				Grade	vc (m/min)	Feed				
						Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	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	PC325U	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	PC325U	72(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		Hardened low alloy steel	200~400	PC325U	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	PC325U	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
		Hardened high alloy steel	Over 250	PC325U	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	PC325U	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	PC325U	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	PC325U	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	PC325U	72(56~112)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
N	Aluminum	Aluminum alloy	30~150	FG2	120(100~176)	0.19~0.30	0.30~0.42	0.42~0.60	0.49~0.68	0.54~0.78
	Copper alloy	Copper alloy	150~160	FG2	120(100~176)	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 external coolant system applied

ESDP-☐P



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

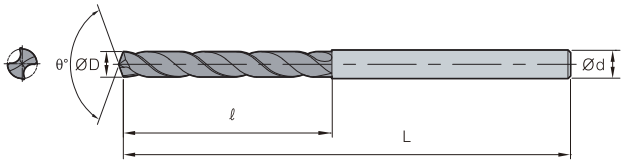
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P		7P	
				ℓ	L	ℓ	L	ℓ	L
ESDP	010 - ☐ P	1.0	3	5	45	8	45	12	60
	011 - ☐ P	1.1	3	6	45	9	45	12	60
	012 - ☐ P	1.2	3	6	45	10	45	12	60
	013 - ☐ P	1.3	3	7	45	10	45	15	60
	014 - ☐ P	1.4	3	7	45	11	45	15	60
	015 - ☐ P	1.5	3	7	45	11	45	15	60
	016 - ☐ P	1.6	3	8	45	12	45	20	60
	017 - ☐ P	1.7	3	8	45	12	45	20	60
	018 - ☐ P	1.8	3	9	45	13	45	20	60
	019 - ☐ P	1.9	3	9	45	14	45	20	60
	020 - ☐ P	2.0	3	10	50	18	50	25	66
	021 - ☐ P	2.1	3	10	50	18	50	25	66
	022 - ☐ P	2.2	3	12	50	18	50	25	66
	023 - ☐ P	2.3	3	12	50	18	50	25	66
	024 - ☐ P	2.4	3	12	50	18	50	30	66
	025 - ☐ P	2.5	3	12	50	18	50	30	66
	026 - ☐ P	2.6	3	12	50	18	50	30	66
	027 - ☐ P	2.7	3	15	50	18	50	30	66
	028 - ☐ P	2.8	3	15	50	18	50	30	66
	029 - ☐ P	2.9	3	15	50	18	50	30	66
	030 - ☐ P	3.0	3	16	55	20	55	45	80
	031 - ☐ P	3.1	4	16	55	20	55	45	80
	032 - ☐ P	3.2	4	16	55	20	55	45	80
	033 - ☐ P	3.3	4	16	55	20	55	45	80
	034 - ☐ P	3.4	4	16	55	20	55	45	80
	035 - ☐ P	3.5	4	16	55	20	55	45	80
	036 - ☐ P	3.6	4	18	55	25	55	45	80
	037 - ☐ P	3.7	4	18	55	25	55	45	80
	038 - ☐ P	3.8	4	20	55	25	55	45	80
	039 - ☐ P	3.9	4	20	55	25	55	45	80
	040 - ☐ P	4.0	4	20	55	25	55	45	80
	041 - ☐ P	4.1	5	20	55	25	55	45	80
	042 - ☐ P	4.2	5	20	63	33	63	45	80
	043 - ☐ P	4.3	5	23	63	33	63	45	80
	044 - ☐ P	4.4	5	23	63	33	63	45	80
	045 - ☐ P	4.5	5	23	63	33	63	45	80
	046 - ☐ P	4.6	5	23	63	33	63	45	80
	047 - ☐ P	4.7	5	23	63	33	63	45	80
	048 - ☐ P	4.8	5	25	63	33	63	45	80
	049 - ☐ P	4.9	5	25	63	33	63	45	80
	050 - ☐ P	5.0	5	25	63	33	63	45	80

※ Pre-orders can be made in advance for non-stock items

ESDP-□P



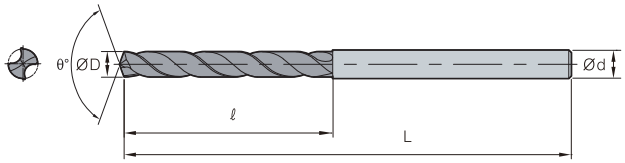
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P		7P	
				ℓ	L	ℓ	L	ℓ	L
ESDP	051 - □ P	5.1	6	25	63	33	63	45	80
	052 - □ P	5.2	6	28	66	36	66	50	83
	053 - □ P	5.3	6	28	66	36	66	50	83
	054 - □ P	5.4	6	28	66	36	66	50	83
	055 - □ P	5.5	6	28	66	36	66	50	83
	056 - □ P	5.6	6	28	66	36	66	50	83
	057 - □ P	5.7	6	28	66	36	66	50	83
	058 - □ P	5.8	6	28	66	36	66	50	83
	059 - □ P	5.9	6	28	66	36	66	50	83
	060 - □ P	6.0	6	30	66	36	66	50	83
	061 - □ P	6.1	7	30	66	36	66	50	83
	062 - □ P	6.2	7	32	75	42	75	53	85
	063 - □ P	6.3	7	32	75	42	75	53	85
	064 - □ P	6.4	7	32	75	42	75	53	85
	065 - □ P	6.5	7	32	75	42	75	53	85
	066 - □ P	6.6	7	32	75	42	75	53	85
	067 - □ P	6.7	7	32	75	42	75	53	85
	068 - □ P	6.8	7	32	75	42	75	53	85
	069 - □ P	6.9	7	32	75	42	75	53	85
	070 - □ P	7.0	7	32	75	42	75	53	85
	071 - □ P	7.1	8	32	75	42	75	53	85
	072 - □ P	7.2	8	36	80	46	80	58	90
	073 - □ P	7.3	8	36	80	46	80	58	90
	074 - □ P	7.4	8	36	80	46	80	58	90
	075 - □ P	7.5	8	36	80	46	80	58	90
	076 - □ P	7.6	8	36	80	46	80	58	90
	077 - □ P	7.7	8	36	80	46	80	58	90
	078 - □ P	7.8	8	36	80	46	80	58	90
	079 - □ P	7.9	8	36	80	46	80	58	90
	080 - □ P	8.0	8	36	80	46	80	58	90
	081 - □ P	8.1	9	36	80	46	80	58	90
	082 - □ P	8.2	9	38	85	50	85	64	98
	083 - □ P	8.3	9	38	85	50	85	64	98
	084 - □ P	8.4	9	38	85	50	85	64	98
	085 - □ P	8.5	9	38	85	50	85	64	98
	086 - □ P	8.6	9	40	85	50	85	64	98
	087 - □ P	8.7	9	40	85	50	85	64	98
	088 - □ P	8.8	9	40	85	50	85	64	98
	089 - □ P	8.9	9	40	85	50	85	64	98
	090 - □ P	9.0	9	40	85	50	85	64	98

ESDP-□P



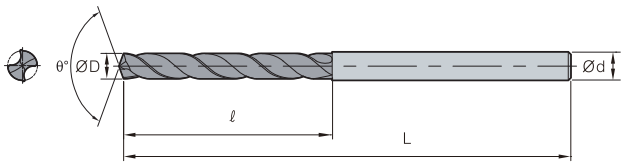
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P		7P	
				ℓ	L	ℓ	L	ℓ	L
ESDP	091 - □ P	9.1	10	42	85	50	85	64	98
	092 - □ P	9.2	10	42	90	55	90	68	105
	093 - □ P	9.3	10	42	90	55	90	68	105
	094 - □ P	9.4	10	42	90	55	90	68	105
	095 - □ P	9.5	10	42	90	55	90	68	105
	096 - □ P	9.6	10	45	90	55	90	68	105
	097 - □ P	9.7	10	45	90	55	90	68	105
	098 - □ P	9.8	10	45	90	55	90	68	105
	099 - □ P	9.9	10	45	90	55	90	68	105
	100 - □ P	10.0	10	45	90	55	90	68	105
	101 - □ P	10.1	11	-	-	55	90	68	105
	102 - □ P	10.2	11	-	-	57	95	73	110
	103 - □ P	10.3	11	-	-	57	95	73	110
	104 - □ P	10.4	11	-	-	57	95	73	110
	105 - □ P	10.5	11	-	-	57	95	73	110
	106 - □ P	10.6	11	-	-	57	95	73	110
	107 - □ P	10.7	11	-	-	57	95	73	110
	108 - □ P	10.8	11	-	-	57	95	73	110
	109 - □ P	10.9	11	-	-	57	95	73	110
	110 - □ P	11.0	11	-	-	57	95	73	110
	111 - □ P	11.1	12	-	-	57	95	73	110
	112 - □ P	11.2	12	-	-	63	102	80	120
	113 - □ P	11.3	12	-	-	63	102	80	120
	114 - □ P	11.4	12	-	-	63	102	80	120
	115 - □ P	11.5	12	-	-	63	102	80	120
	116 - □ P	11.6	12	-	-	63	102	80	120
	117 - □ P	11.7	12	-	-	63	102	80	120
	118 - □ P	11.8	12	-	-	63	102	80	120
	119 - □ P	11.9	12	-	-	63	102	80	120
	120 - □ P	12.0	12	-	-	63	102	80	120
	121 - □ P	12.1	13	-	-	63	102	80	120
	122 - □ P	12.2	13	-	-	63	102	90	137
	123 - □ P	12.3	13	-	-	63	102	90	137
	124 - □ P	12.4	13	-	-	63	102	90	137
	125 - □ P	12.5	13	-	-	63	102	90	137
	126 - □ P	12.6	13	-	-	63	102	90	137
	127 - □ P	12.7	13	-	-	63	102	90	137
	128 - □ P	12.8	13	-	-	63	102	90	137
	129 - □ P	12.9	13	-	-	63	102	90	137
	130 - □ P	13.0	13	-	-	63	102	90	137

ESDP-□P



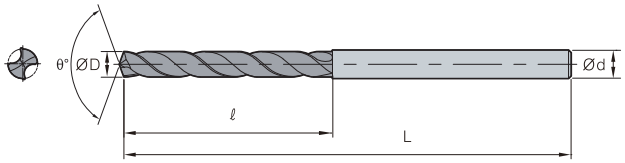
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	5P		7P	
				ℓ	L	ℓ	L
ESDP	131 - □ P	13.1	14	63	102	90	137
	132 - □ P	13.2	14	65	107	96	147
	133 - □ P	13.3	14	65	107	96	147
	134 - □ P	13.4	14	65	107	96	147
	135 - □ P	13.5	14	65	107	96	147
	136 - □ P	13.6	14	65	107	96	147
	137 - □ P	13.7	14	65	107	96	147
	138 - □ P	13.8	14	65	107	96	147
	139 - □ P	13.9	14	65	107	96	147
	140 - □ P	14.0	14	65	107	96	147
	141 - □ P	14.1	15	65	107	96	147
	142 - □ P	14.2	15	68	115	100	153
	143 - □ P	14.3	15	68	115	100	153
	144 - □ P	14.4	15	68	115	100	153
	145 - □ P	14.5	15	68	115	100	153
	146 - □ P	14.6	15	68	115	100	153
	147 - □ P	14.7	15	68	115	100	153
	148 - □ P	14.8	15	68	115	100	153
	149 - □ P	14.9	15	68	115	100	153
	150 - □ P	15.0	15	68	115	100	153
	151 - □ P	15.1	16	68	115	100	153
	152 - □ P	15.2	16	70	120	112	160
	153 - □ P	15.3	16	70	120	112	160
	154 - □ P	15.4	16	70	120	112	160
	155 - □ P	15.5	16	70	120	112	160
	156 - □ P	15.6	16	70	120	112	160
	157 - □ P	15.7	16	70	120	112	160
	158 - □ P	15.8	16	70	120	112	160
	159 - □ P	15.9	16	70	120	112	160
	160 - □ P	16.0	16	70	120	112	160
	161 - □ P	16.1	17	70	120	112	160
	162 - □ P	16.2	17	70	120	112	160
	163 - □ P	16.3	17	70	120	112	160
	164 - □ P	16.4	17	70	120	112	160
	165 - □ P	16.5	17	72	125	112	160
	166 - □ P	16.6	17	72	125	112	160
	167 - □ P	16.7	17	72	125	112	160
	168 - □ P	16.8	17	72	125	112	160
	169 - □ P	16.9	17	72	125	112	160
	170 - □ P	17.0	17	72	125	112	160

ESDP-□P



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

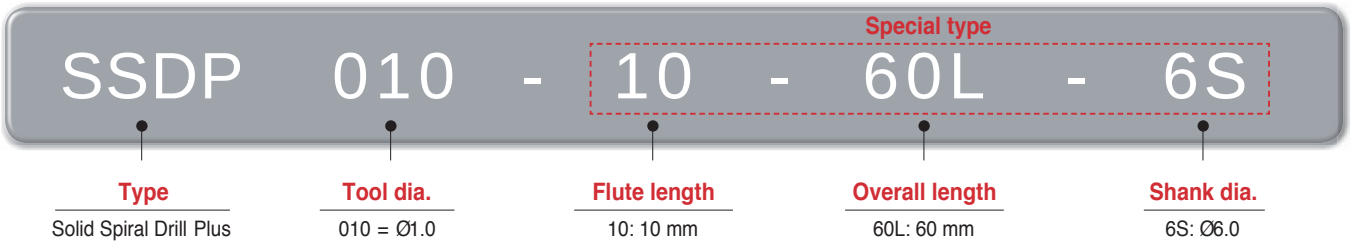
Designation		ØD	Ød	5P		7P	
				ℓ	L	ℓ	L
ESDP	171 - □ P	17.1	18	72	125	112	160
	172 - □ P	17.2	18	72	125	112	160
	173 - □ P	17.3	18	72	125	112	160
	174 - □ P	17.4	18	72	125	112	160
	175 - □ P	17.5	18	75	130	112	160
	176 - □ P	17.6	18	75	130	112	160
	177 - □ P	17.7	18	75	130	112	160
	178 - □ P	17.8	18	75	130	112	160
	179 - □ P	17.9	18	75	130	112	160
	180 - □ P	18.0	18	75	130	112	160
	181 - □ P	18.1	19	75	130	112	160
	182 - □ P	18.2	19	75	130	112	160
	183 - □ P	18.3	19	75	130	112	160
	184 - □ P	18.4	19	75	130	112	160
	185 - □ P	18.5	19	78	130	112	160
	186 - □ P	18.6	19	78	130	112	160
	187 - □ P	18.7	19	78	130	112	160
	188 - □ P	18.8	19	78	130	112	160
	189 - □ P	18.9	19	78	130	112	160
	190 - □ P	19.0	19	78	130	112	160
	191 - □ P	19.1	20	78	130	112	160
	192 - □ P	19.2	20	78	130	112	160
	193 - □ P	19.3	20	78	130	112	160
	194 - □ P	19.4	20	78	130	112	160
	195 - □ P	19.5	20	82	135	112	160
	196 - □ P	19.6	20	82	135	112	160
	197 - □ P	19.7	20	82	135	112	160
	198 - □ P	19.8	20	82	135	112	160
	199 - □ P	19.9	20	82	135	112	160
	200 - □ P	20.0	20	82	135	112	160

High quality solid drill for high performance

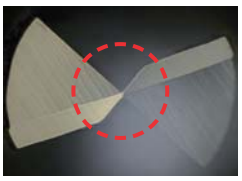
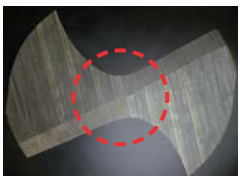
SSD Plus new

- Improved chip control thanks to the new flute design
- Higher quality machining achieved from improved surface finish and forming
- Increased productivity thanks to stable tool life
- A variety of workpiece materials available including mild steel and non-ferrous

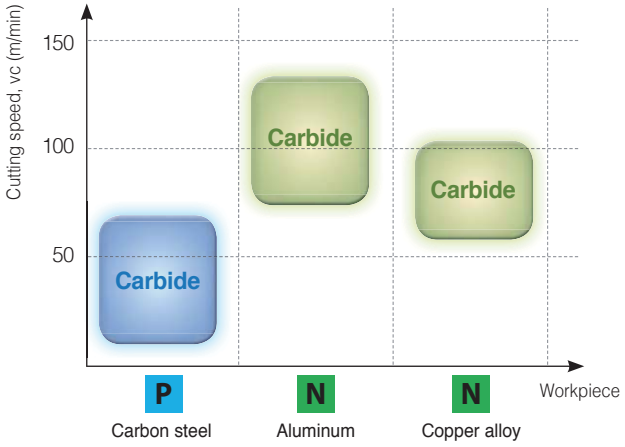
Code system



Features

Division	Shape	Application area
SSD Plus (SSDP)		P, N
existing SSD		N

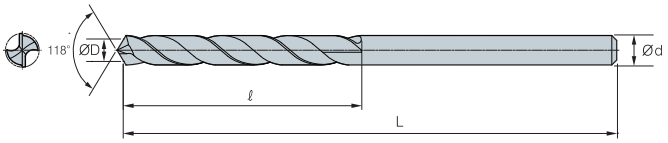
Application area



Recommended cutting condition

Workpiece				Grade	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia.(mm)			
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	Carbon steel	Low carbon steel	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	Aluminum	Aluminum alloy	30~150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	Copper alloy	Copper alloy	150~160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

SSDP



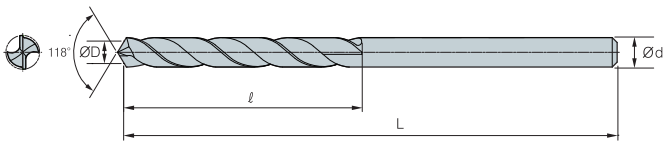
Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation		ØD = Ød	ℓ	L
SSDP	010	1.0	10	32
	011	1.1	10	32
	012	1.2	10	32
	013	1.3	10	32
	014	1.4	10	32
	015	1.5	13	35
	016	1.6	13	35
	017	1.7	13	35
	018	1.8	13	35
	019	1.9	13	35
	020	2.0	18	40
	021	2.1	18	40
	022	2.2	18	40
	023	2.3	18	40
	024	2.4	18	40
	025	2.5	22	45
	026	2.6	22	45
	027	2.7	22	45
	028	2.8	22	45
	029	2.9	22	45
	030	3.0	25	50
	031	3.1	25	50
	032	3.2	25	50
	033	3.3	28	50
	034	3.4	28	50
	035	3.5	28	50
	036	3.6	30	55
	037	3.7	30	55
	038	3.8	30	55
	039	3.9	30	55
	040	4.0	30	55
	041	4.1	34	60
	042	4.2	34	60
	043	4.3	34	60
	044	4.4	34	60
	045	4.5	34	60
	046	4.6	38	65
	047	4.7	38	65

Designation		ØD = Ød	ℓ	L
SSDP	048	4.8	38	65
	049	4.9	38	65
	050	5.0	38	65
	051	5.1	38	65
	052	5.2	38	65
	053	5.3	38	65
	054	5.4	38	65
	055	5.5	38	65
	056	5.6	40	75
	057	5.7	40	75
	058	5.8	40	75
	059	5.9	40	75
	060	6.0	40	75
	061	6.1	40	75
	062	6.2	40	75
	063	6.3	40	75
	064	6.4	40	75
	065	6.5	40	75
	066	6.6	46	80
	067	6.7	46	80
	068	6.8	46	80
	069	6.9	46	80
	070	7.0	46	80
	071	7.1	46	80
	072	7.2	46	80
	073	7.3	46	80
	074	7.4	46	80
	075	7.5	46	80
	076	7.6	50	85
	077	7.7	50	85
	078	7.8	50	85
	079	7.9	50	85
	080	8.0	50	85
	081	8.1	50	85
	082	8.2	50	85
	083	8.3	50	85
	084	8.4	50	85
	085	8.5	50	85

SSDP



Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation		ØD = Ød	ℓ	L
SSDP	086	8.6	50	95
	087	8.7	50	95
	088	8.8	50	95
	089	8.9	50	95
	090	9.0	50	95
	091	9.1	50	95
	092	9.2	50	95
	093	9.3	50	95
	094	9.4	50	95
	095	9.5	50	95
	096	9.6	50	100

Designation		ØD = Ød	ℓ	L
SSDP	097	9.7	50	100
	098	9.8	50	100
	099	9.9	50	100
	100	10.0	50	100
	105	10.5	60	115
	110	11.0	60	115
	115	11.5	65	120
	120	12.0	65	120
	125	12.5	65	125
	130	13.0	65	125
	150	15.0	70	130