

Eco Solid Drill Plus

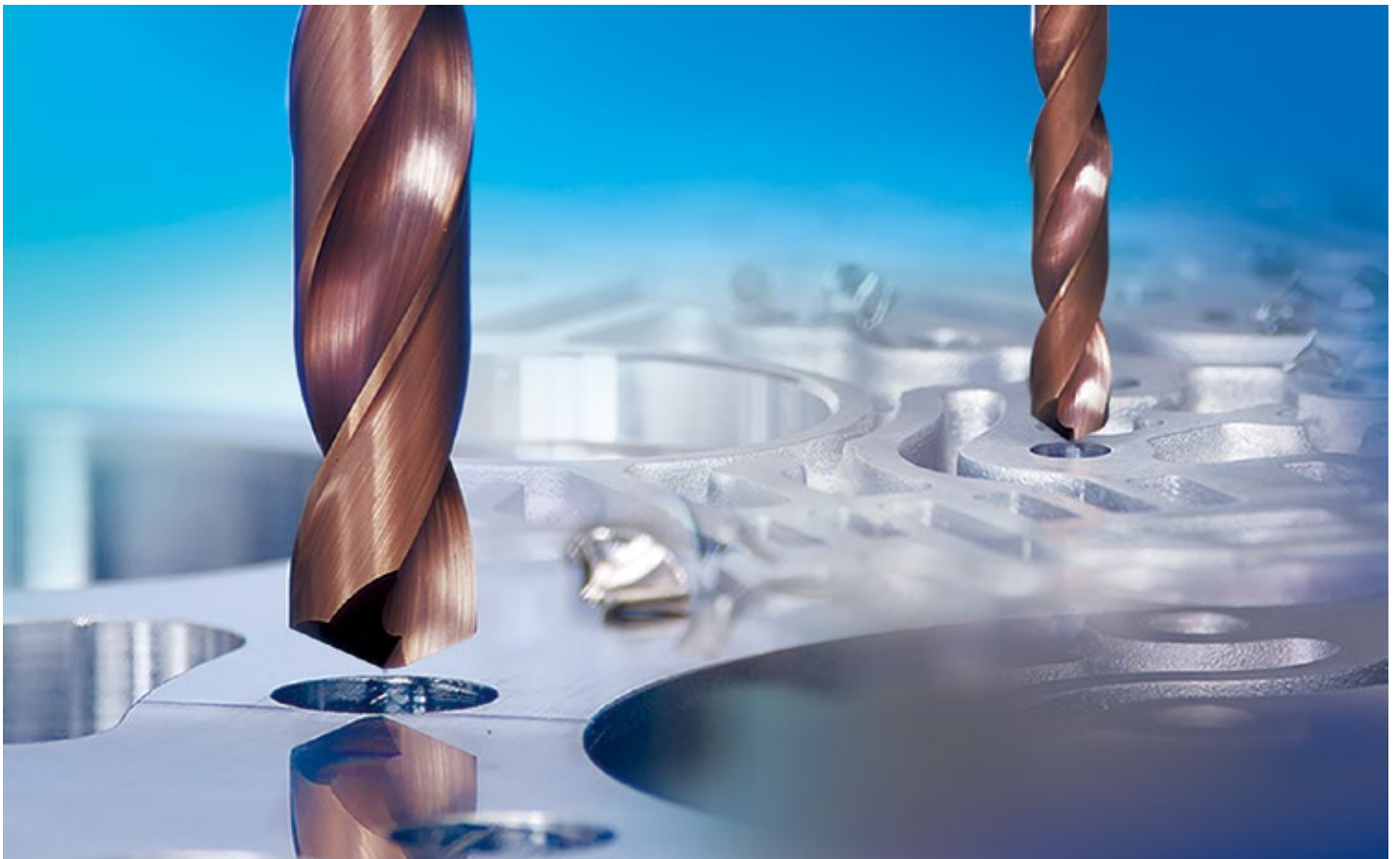
ESD Plus



Economical Solid Drill

Highly efficient hole machining for various workpieces including automotive components

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



Economical Solid Drill

ESD Plus



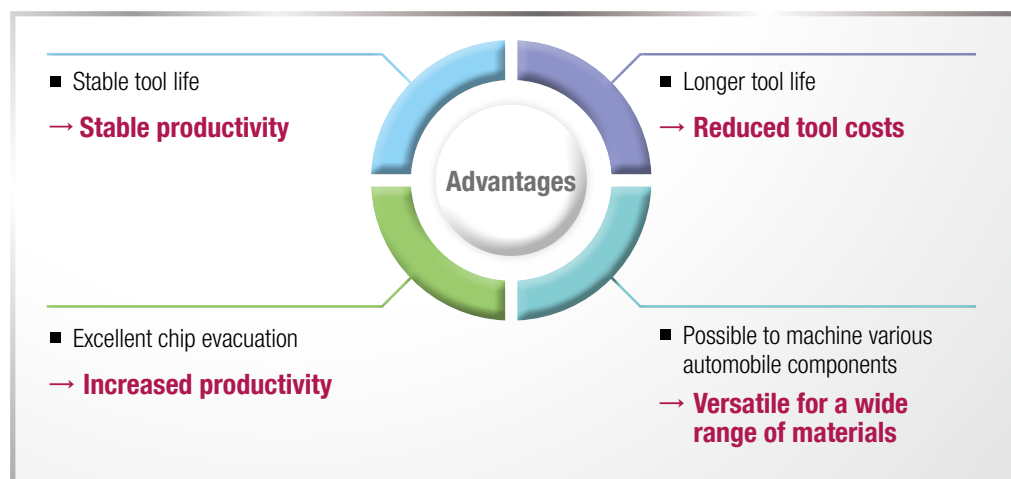
ESD Plus

For universal hole making

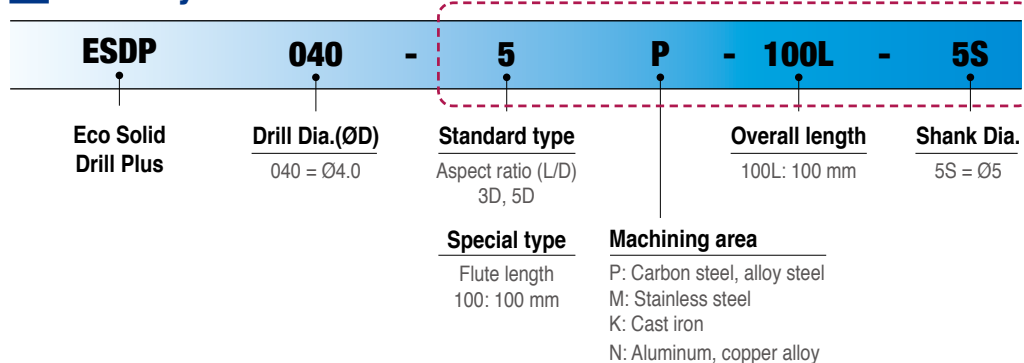
Drilling is now used not only for automotive parts, but also extensively across all industries including the IT field. There are various applications in drilling, from high speed and feed machining to dry or wet. In addition, a variety of workpiece materials such as carbon steel, cast iron and alloy steel are being used, which makes for excellent tool life and stable machining more important.

ESD Plus is a highly efficient solid drill with increased stability and excellent performance. Wider chip pockets have produced significantly improved chip evacuation, leading to higher machinability and longer tool life. Now, with the ESD Plus, high quality industrial products can be achieved with ease.

Newly applied **PC325U** coating improves the surface lubricity compared to existing products, reducing the cutting load. Additionally, it features stronger resistance to wear and built-up edges, which extends the tool life. Furthermore, it provides stable and excellent performance in wide applications from low to high speeds, enabling various product processing.



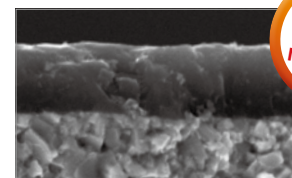
Code System



Features

New grade (PC325U)

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



[PC325U]

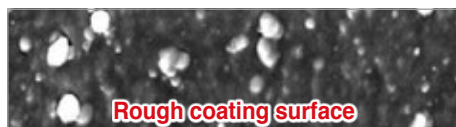


Increased **welding resistance** and wear **resistance** with new PC325U grade applied.

The **PC325U coating surface** is more lubricated than our competitors' rough surface.

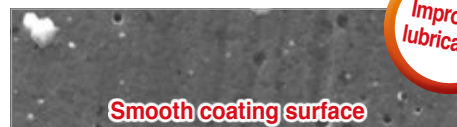
Surface of coating layer

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



Rough coating surface

[Competitor]



Smooth coating surface

[PC325U]

Improved lubrication

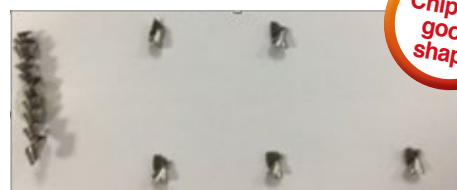
Good chip shape when machining with ESD Plus in wider applications compared to competitor's.

Chip control

- **Workpiece** 42CrMo4*
- **Cutting conditions** vc (m/min) = 40, fn (mm/rev) = 0.1, ap (mm) = 30, wet
- **Tools** ESDP060-5P



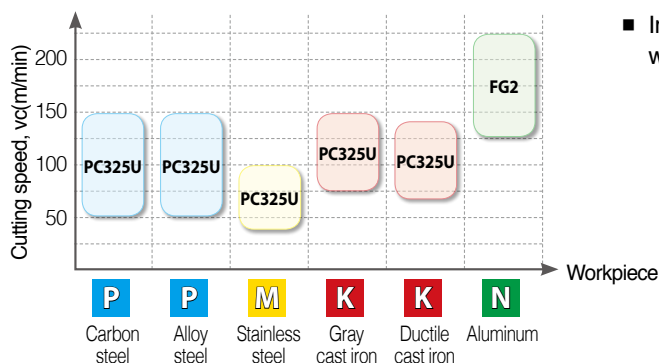
[Competitor]



[ESD Plus]

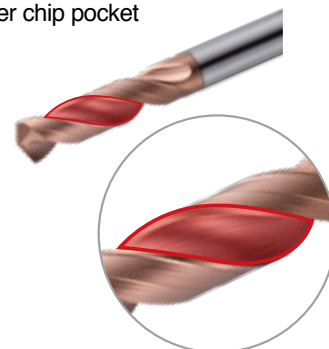
Chips in good shape

Application area

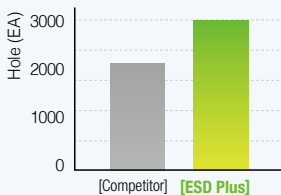


Flute shape

- Improved chip evacuation due to wider chip pocket



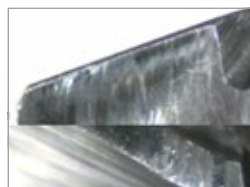
Performance Evaluation



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

Comparison of wear

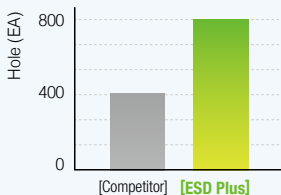
- **Workpiece** 42CrMo4
- **Cutting conditions** vc(m/min) = 124, fn(mm/rev) = 0.15, ap(mm) = 30, External coolant
- **Tools** MSDPH060-5P(PC325U)



[Competitor]



[ESD Plus]



Special treatment on coating surface minimizes frictional resistance.

Application example

- **Workpiece** C45
- **Cutting conditions** vc(m/min) = 50, fn(mm/rev) = 0.08, ap(mm) = 23.5, External coolant
- **Tools** ESDP090-5P

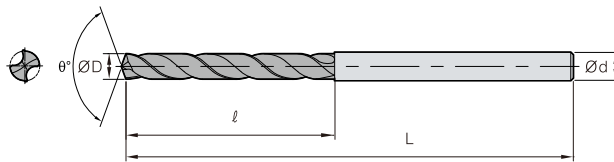


⇒ Recommended Cutting Conditions

Workpiece			Grade	Cutting speed vc (m/min)	Depth of cut = 10D-25D					
ISO	Workpiece materials	Hardness (HB)			Feed rate (mm/rev) per drill dia. (mm)					
					Ø2,5-4,0	Ø4,1-8,0	Ø8,1-12,0	Ø12,1-16,0	Ø16,1-20,0	
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

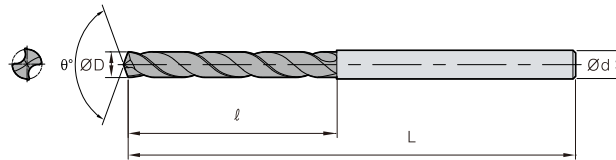


Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Ø)	h7			
Tolerance (shank Ø)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	Steel	Stainless steel	Cast iron	Non-ferrous metal

(mm)

Designation	ØD	Ød	3P		5P	
			ℓ	L	ℓ	L
ESDP 010-_P	1.0	3	5	45	8	45
011-_P	1.1	3	6	45	9	45
012-_P	1.2	3	6	45	10	45
013-_P	1.3	3	7	45	10	45
014-_P	1.4	3	7	45	11	45
015-_P	1.5	3	7	45	11	45
016-_P	1.6	3	8	45	12	45
017-_P	1.7	3	8	45	12	45
018-_P	1.8	3	9	45	13	45
019-_P	1.9	3	9	45	14	45
020-_P	2.0	3	10	50	18	50
021-_P	2.1	3	10	50	18	50
022-_P	2.2	3	12	50	18	50
023-_P	2.3	3	12	50	18	50
024-_P	2.4	3	12	50	18	50

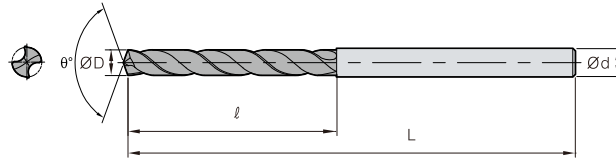
※ Pre-orders can be made in advance for non-stock items.



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Ø)	h7			
Tolerance (shank Ø)	h6			
Point angle	140°		135°	
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	Steel	Stainless steel	Cast iron	Non-ferrous metal

(mm)

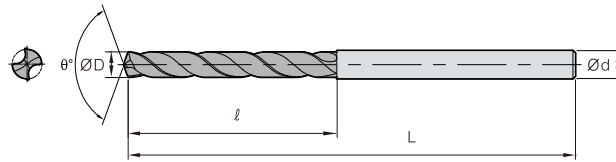
Designation	ØD	Ød	3P		5P	
			ℓ	L	ℓ	L
ESDP 025 - _P	2.5	3	12	50	18	50
026 - _P	2.6	3	12	50	18	50
027 - _P	2.7	3	15	50	18	50
028 - _P	2.8	3	15	50	18	50
029 - _P	2.9	3	15	50	18	50
030 - _P	3.0	3	16	55	20	55
031 - _P	3.1	4	16	55	20	55
032 - _P	3.2	4	16	55	20	55
033 - _P	3.3	4	16	55	20	55
034 - _P	3.4	4	16	55	20	55
035 - _P	3.5	4	16	55	20	55
036 - _P	3.6	4	18	55	25	55
037 - _P	3.7	4	18	55	25	55
038 - _P	3.8	4	20	55	25	55
039 - _P	3.9	4	20	55	25	55
040 - _P	4.0	4	20	55	25	55
041 - _P	4.1	5	20	55	25	55
042 - _P	4.2	5	20	63	33	63
043 - _P	4.3	5	23	63	33	63
044 - _P	4.4	5	23	63	33	63
045 - _P	4.5	5	23	63	33	63
046 - _P	4.6	5	23	63	33	63
047 - _P	4.7	5	23	63	33	63
048 - _P	4.8	5	25	63	33	63
049 - _P	4.9	5	25	63	33	63
050 - _P	5.0	5	25	63	33	63
051 - _P	5.1	6	25	63	33	63
052 - _P	5.2	6	28	66	36	66
053 - _P	5.3	6	28	66	36	66
054 - _P	5.4	6	28	66	36	66
055 - _P	5.5	6	28	66	36	66
056 - _P	5.6	6	28	66	36	66
057 - _P	5.7	6	28	66	36	66
058 - _P	5.8	6	28	66	36	66
059 - _P	5.9	6	28	66	36	66
060 - _P	6.0	6	30	66	36	66
061 - _P	6.1	7	30	66	36	66
062 - _P	6.2	7	32	75	42	75
063 - _P	6.3	7	32	75	42	75
064 - _P	6.4	7	32	75	42	75
065 - _P	6.5	7	32	75	42	75
066 - _P	6.6	7	32	75	42	75
067 - _P	6.7	7	32	75	42	75
068 - _P	6.8	7	32	75	42	75
069 - _P	6.9	7	32	75	42	75
070 - _P	7.0	7	32	75	42	75
071 - _P	7.1	8	32	75	42	75
072 - _P	7.2	8	36	80	46	80



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Ø)	h7			
Tolerance (shank Ø)	h6			
Point angle	140°		135°	
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	Steel	Stainless steel	Cast iron	Non-ferrous metal

(mm)

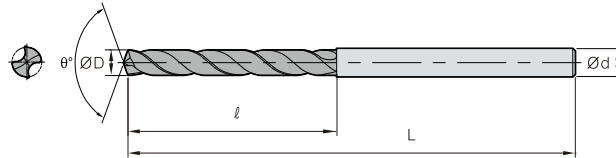
Designation	ØD	Ød	3P		5P	
			l	L	l	L
ESDP 073- _P	7.3	8	36	80	46	80
074- _P	7.4	8	36	80	46	80
075- _P	7.5	8	36	80	46	80
076- _P	7.6	8	36	80	46	80
077- _P	7.7	8	36	80	46	80
078- _P	7.8	8	36	80	46	80
079- _P	7.9	8	36	80	46	80
080- _P	8.0	8	36	80	46	80
081- _P	8.1	9	36	80	46	80
082- _P	8.2	9	38	85	50	85
083- _P	8.3	9	38	85	50	85
084- _P	8.4	9	38	85	50	85
085- _P	8.5	9	38	85	50	85
086- _P	8.6	9	40	85	50	85
087- _P	8.7	9	40	85	50	85
088- _P	8.8	9	40	85	50	85
089- _P	8.9	9	40	85	50	85
090- _P	9.0	9	40	85	50	85
091- _P	9.1	10	42	85	50	85
092- _P	9.2	10	42	90	55	90
093- _P	9.3	10	42	90	55	90
094- _P	9.4	10	42	90	55	90
095- _P	9.5	10	42	90	55	90
096- _P	9.6	10	45	90	55	90
097- _P	9.7	10	45	90	55	90
098- _P	9.8	10	45	90	55	90
099- _P	9.9	10	45	90	55	90
100- _P	10.0	10	45	90	55	90
101- 5P	10.1	11	-	-	55	90
102- 5P	10.2	11	-	-	57	95
103- 5P	10.3	11	-	-	57	95
104- 5P	10.4	11	-	-	57	95
105- 5P	10.5	11	-	-	57	95
106- 5P	10.6	11	-	-	57	95
107- 5P	10.7	11	-	-	57	95
108- 5P	10.8	11	-	-	57	95
109- 5P	10.9	11	-	-	57	95
110- 5P	11.0	11	-	-	57	95
111- 5P	11.1	12	-	-	57	95
112- 5P	11.2	12	-	-	63	102
113- 5P	11.3	12	-	-	63	102
114- 5P	11.4	12	-	-	63	102
115- 5P	11.5	12	-	-	63	102
116- 5P	11.6	12	-	-	63	102
117- 5P	11.7	12	-	-	63	102
118- 5P	11.8	12	-	-	63	102
119- 5P	11.9	12	-	-	63	102
120- 5P	12.0	12	-	-	63	102



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Ø)	h7			
Tolerance (shank Ø)	h6			
Point angle	140°		135°	
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	Steel	Stainless steel	Cast iron	Non-ferrous metal

(mm)

Designation	ØD	Ød	5P	
			ℓ	L
ESDP 121 -5P	12.1	13	63	102
122 -5P	12.2	13	63	102
123 -5P	12.3	13	63	102
124 -5P	12.4	13	63	102
125 -5P	12.5	13	63	102
126 -5P	12.6	13	63	102
127 -5P	12.7	13	63	102
128 -5P	12.8	13	63	102
129 -5P	12.9	13	63	102
130 -5P	13.0	13	63	102
131 -5P	13.1	14	63	102
132 -5P	13.2	14	65	107
133 -5P	13.3	14	65	107
134 -5P	13.4	14	65	107
135 -5P	13.5	14	65	107
136 -5P	13.6	14	65	107
137 -5P	13.7	14	65	107
138 -5P	13.8	14	65	107
139 -5P	13.9	14	65	107
140 -5P	14.0	14	65	107
141 -5P	14.1	15	65	107
142 -5P	14.2	15	68	115
143 -5P	14.3	15	68	115
144 -5P	14.4	15	68	115
145 -5P	14.5	15	68	115
146 -5P	14.6	15	68	115
147 -5P	14.7	15	68	115
148 -5P	14.8	15	68	115
149 -5P	14.9	15	68	115
150 -5P	15.0	15	68	115
151 -5P	15.1	16	68	115
152 -5P	15.2	16	70	120
153 -5P	15.3	16	70	120
154 -5P	15.4	16	70	120
155 -5P	15.5	16	70	120
156 -5P	15.6	16	70	120
157 -5P	15.7	16	70	120
158 -5P	15.8	16	70	120
159 -5P	15.9	16	70	120
160 -5P	16.0	16	70	120
161 -5P	16.1	17	70	120
162 -5P	16.2	17	70	120
163 -5P	16.3	17	70	120
164 -5P	16.4	17	70	120
165 -5P	16.5	17	72	125
166 -5P	16.6	17	72	125
167 -5P	16.7	17	72	125
168 -5P	16.8	17	72	125



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Ø)	h7			
Tolerance (shank Ø)	h6			
Point angle	140°		135°	
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	Steel	Stainless steel	Cast iron	Non-ferrous metal

(mm)

Designation	ØD	Ød	5P	
			ℓ	L
ESDP 169-5P	16.9	17	72	125
170-5P	17.0	17	72	125
171-5P	17.1	18	72	125
172-5P	17.2	18	72	125
173-5P	17.3	18	72	125
174-5P	17.4	18	72	125
175-5P	17.5	18	75	130
176-5P	17.6	18	75	130
177-5P	17.7	18	75	130
178-5P	17.8	18	75	130
179-5P	17.9	18	75	130
180-5P	18.0	18	75	130
181-5P	18.1	19	75	130
182-5P	18.2	19	75	130
183-5P	18.3	19	75	130
184-5P	18.4	19	75	130
185-5P	18.5	19	78	130
186-5P	18.6	19	78	130
187-5P	18.7	19	78	130
188-5P	18.8	19	78	130
189-5P	18.9	19	78	130
190-5P	19.0	19	78	130
191-5P	19.1	20	78	130
192-5P	19.2	20	78	130
193-5P	19.3	20	78	130
194-5P	19.4	20	78	130
195-5P	19.5	20	82	135
196-5P	19.6	20	82	135
197-5P	19.7	20	82	135
198-5P	19.8	20	82	135
199-5P	19.9	20	82	135
200-5P	20.0	20	82	135



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