

Eco Solid Drill Plus

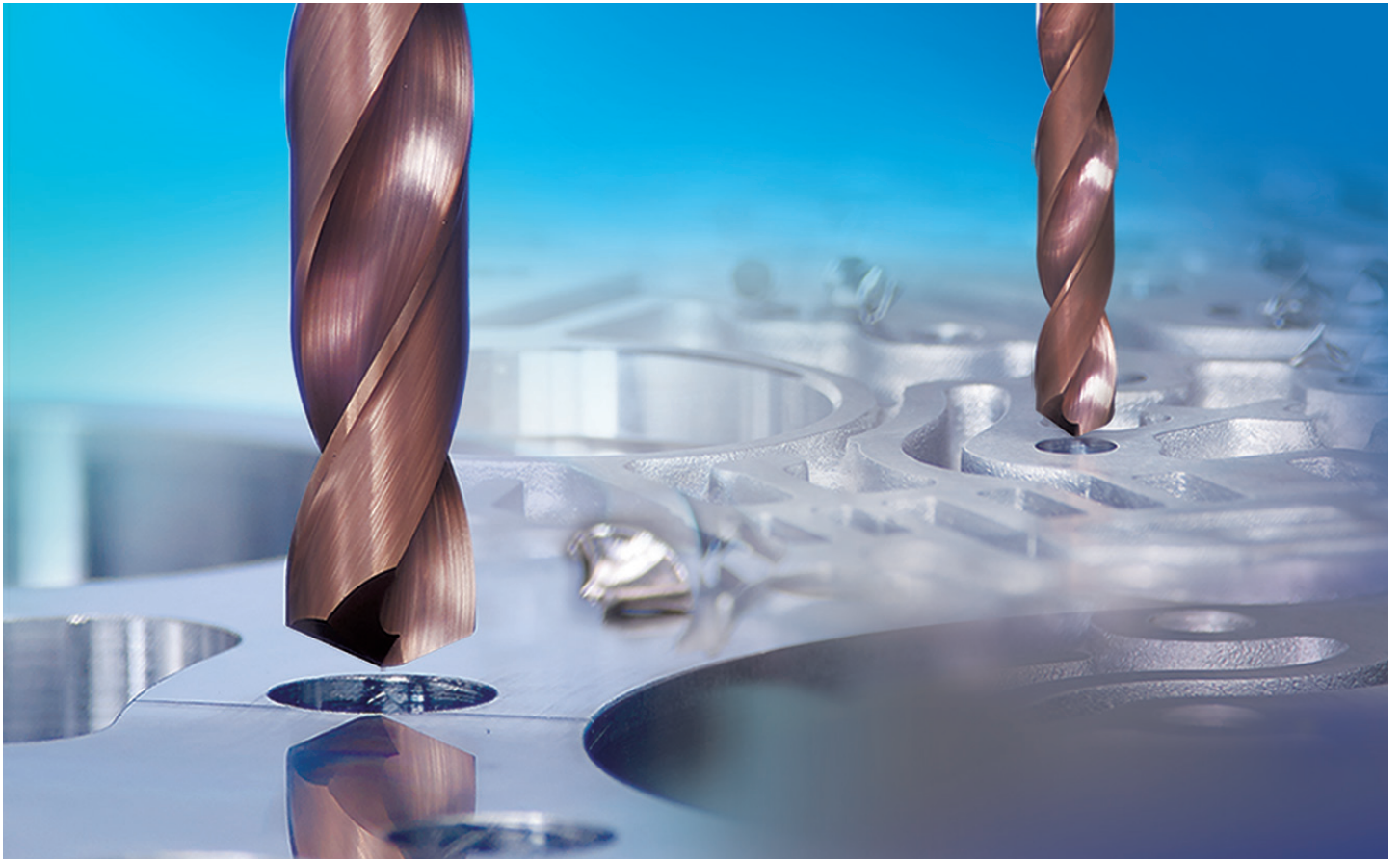
ESD Plus



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





ESD Plus

For universal hole making

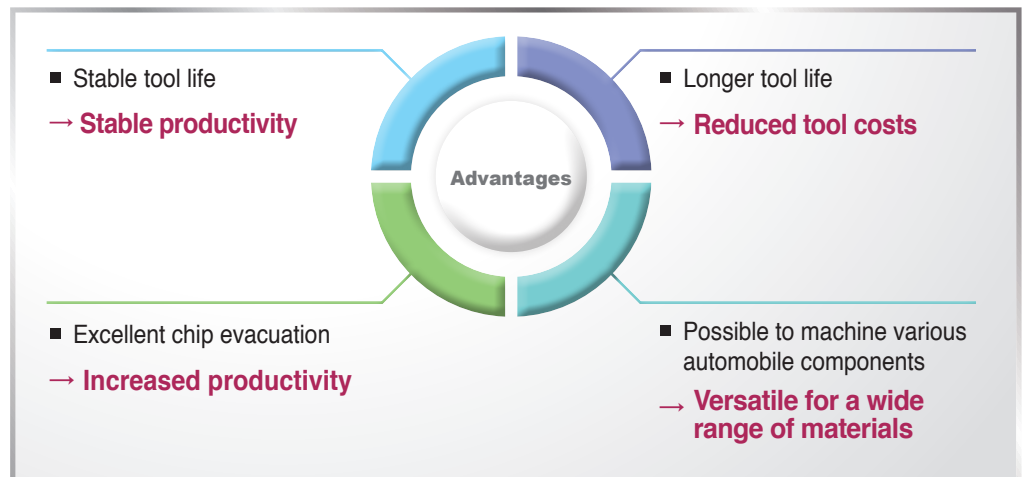
Economical Solid Drill

ESD Plus

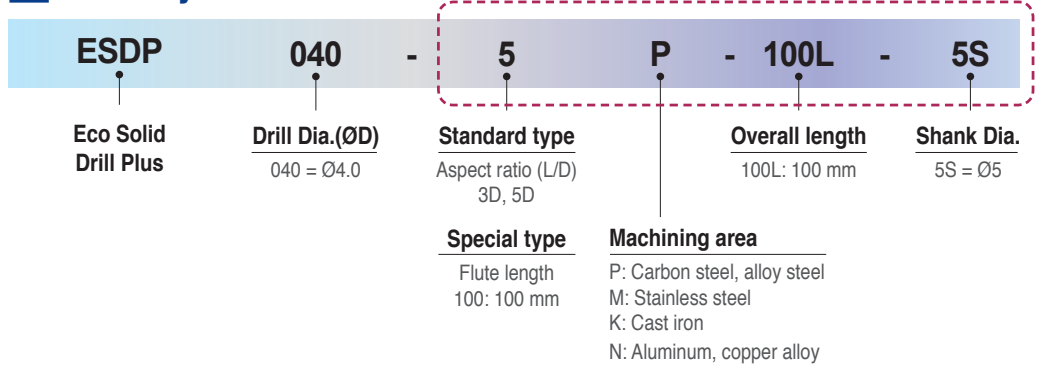
Drilling is now used not only for automotive parts but also extensively across all industries including the IT field. There are various applications in drilling, from high speed and feed machining to dry or wet. In addition, a variety of workpiece materials such as carbon steel, cast iron and alloy steel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



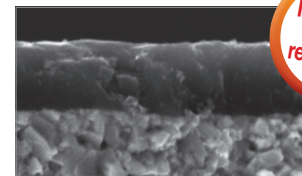
Code System



Features

New grade (PC325U)

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



[PC325U]

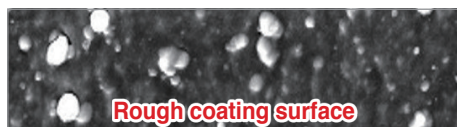


Increased **welding resistance** and wear **resistance** with new PC325U grade applied.

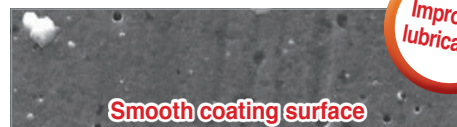
PC325U has a coating surface more lubricated compared to competitor's rough surface.

Surface of coating layer

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



[Competitor]



[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



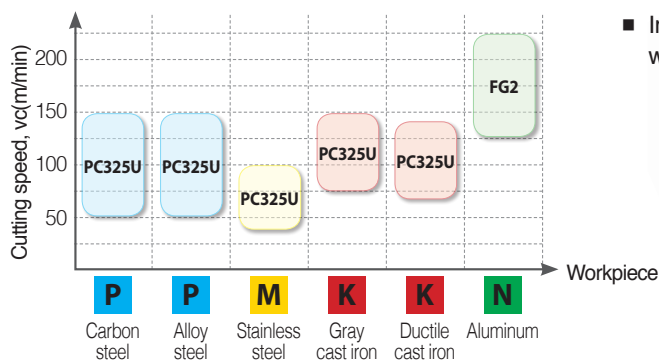
[Competitor]



[ESD Plus]

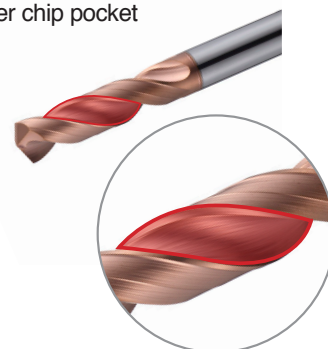
Chips in good shape

Application area

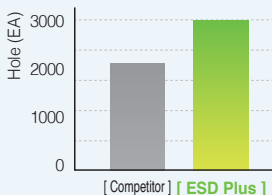


Flute shape

- Improved chip evacuation due to wider chip pocket



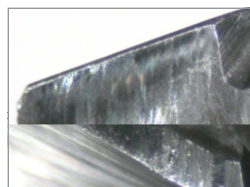
Performance Evaluation



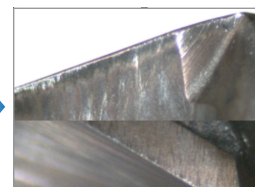
Lubricative coating layer of the new grade PC325U maximizes wear resistance.

Comparison of wear

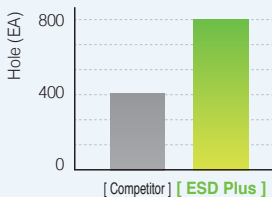
- **Workpiece** 42CrMo4*
- **Cutting conditions** vc (m/min) = 95, fn (mm/rev) = 0.12, ap (mm) = 20, External coolant
- **Tools** ESDP060-5P



[Competitor]



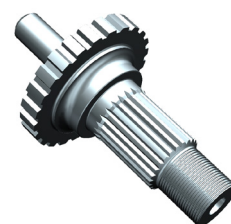
[ESD Plus]



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

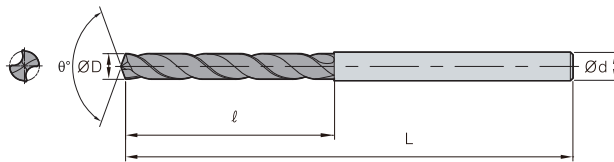


⇒ Recommended Cutting Conditions

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	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
		Martensite series								
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

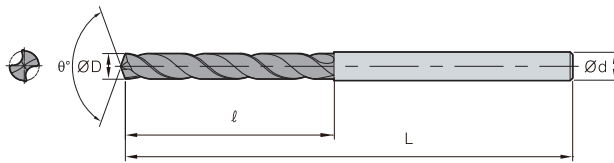


Specification	P	M	K	N
Grade	PC325U		FG2	
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°		135°	
Twist angle	30°			
Thinning	X type			
Coolant	External system			
	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal

(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

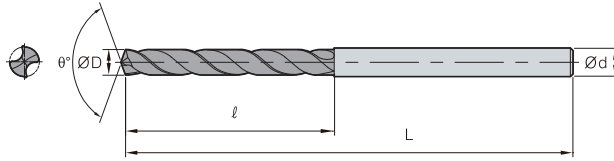
* Pre-orders can be made in advance for non-stock items.



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)

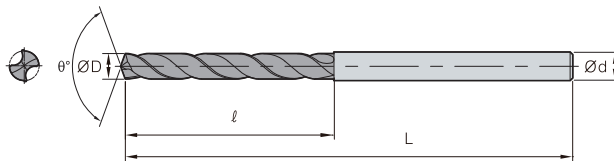
형 번	ØD	Ød	3P		5P		7P	
			ℓ	L	ℓ	L	ℓ	L
ESDP 025-□P	2.5	3	12	50	18	50	30	66
026-□P	2.6	3	12	50	18	50	30	66
027-□P	2.7	3	15	50	18	50	30	66
028-□P	2.8	3	15	50	18	50	30	66
029-□P	2.9	3	15	50	18	50	30	66
030-□P	3.0	3	16	55	20	55	45	80
031-□P	3.1	4	16	55	20	55	45	80
032-□P	3.2	4	16	55	20	55	45	80
033-□P	3.3	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
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



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)

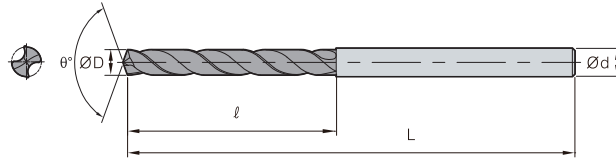
형 번	ØD	Ød	3P		5P		7P		
			ℓ	L	ℓ	L	ℓ	L	
ESDP	073-□P	7.3	8	36	80	46	80	58	90
	074-□P	7.4	8	36	80	46	80	58	90
	075-□P	7.5	8	36	80	46	80	58	90
	076-□P	7.6	8	36	80	46	80	58	90
	077-□P	7.7	8	36	80	46	80	58	90
	078-□P	7.8	8	36	80	46	80	58	90
	079-□P	7.9	8	36	80	46	80	58	90
	080-□P	8.0	8	36	80	46	80	58	90
	081-□P	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
	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	



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)

형 번	ØD	Ød	5P		7P	
			ℓ	L	ℓ	L
ESDP 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
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



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)

형번	ØD	Ød	5P		7P	
			ℓ	L	ℓ	L
ESDP 169-□P	16.9	17	72	125	112	160
170-□P	17.0	17	72	125	112	160
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



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