

# MSD Plus-S

<sup>New</sup>  
<sup>New</sup>  
(3D, 5D, 8D, 10D)

## Mach solid Drill Plus-S for Inconel and Titanium cutting

- Realizing stable cutting due to the optimal cutting edge shape and chip pocket
- Increased tool life from applying coating layer with good chipping resistance at high temperature



# MSD Plus-S

In recent years, the key components' weight went light in the aerospace, power generation and energy industries for the better efficiency, and the use of heat-resistant alloys, with light weight and high strength properties, has greatly increased. Among the heat-resistant alloys, inconel and titanium alloys have characteristics of high temp high strength and low heat conductivity, which causes problems such as thermal shock, work hardening and vibrations due to high concentration of cutting heat during machining; and shorter tool life and lower productivity due to chipping and sudden breakage. To meet these challenges, KORLOY has developed the MSD Plus-S, specialized for inconel and titanium machining, designed to greatly improve machinability and tool life.

The **MSD Plus-S** prevents chipping and sudden breakage with notch-control cutting edges and special edge preparation. Wide chip pockets and the optimized tip flank design significantly improve chip and heat evacuation. This boosts productivity with stable machining even in high temp cutting conditions.

The new grade **PC325T** features stable tool life with excellent heat resistance and oxidation resistance, its exceptional surface finish minimizes built-up edges while smooth chip flow reduces the cutting load at high temperature.

We assure our customers that the MSD Plus-S is the next-generation solution for hole making of components made of inconel & titanium in the aerospace, power generation and energy industries.

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» **Applying cutting edge with low cutting load and special treatment on it**

- Excellent chip control
- Enhancing stable cutting

» **New coating application**

- Stable machining even at the maximum high temperature
- Exclusive HRSA hole making grade with excellent wear resistance and chipping resistance at high temperature

» **Solving troubles in Inconel cutting**

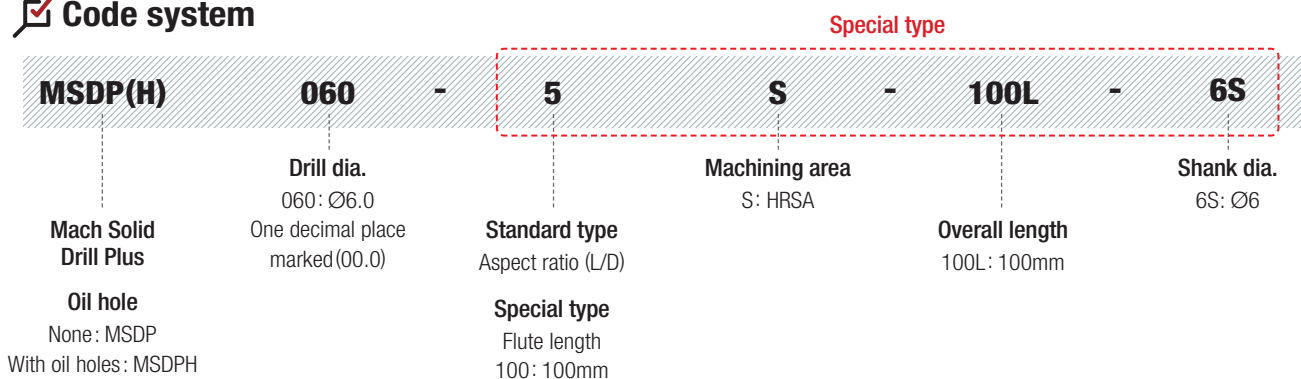
- Preventing chipping on the cutting edge and fracture of tools
- Maximizing tool life and cutting performance

» **Longer tool life**

- Increased productivity and reduced tool cost



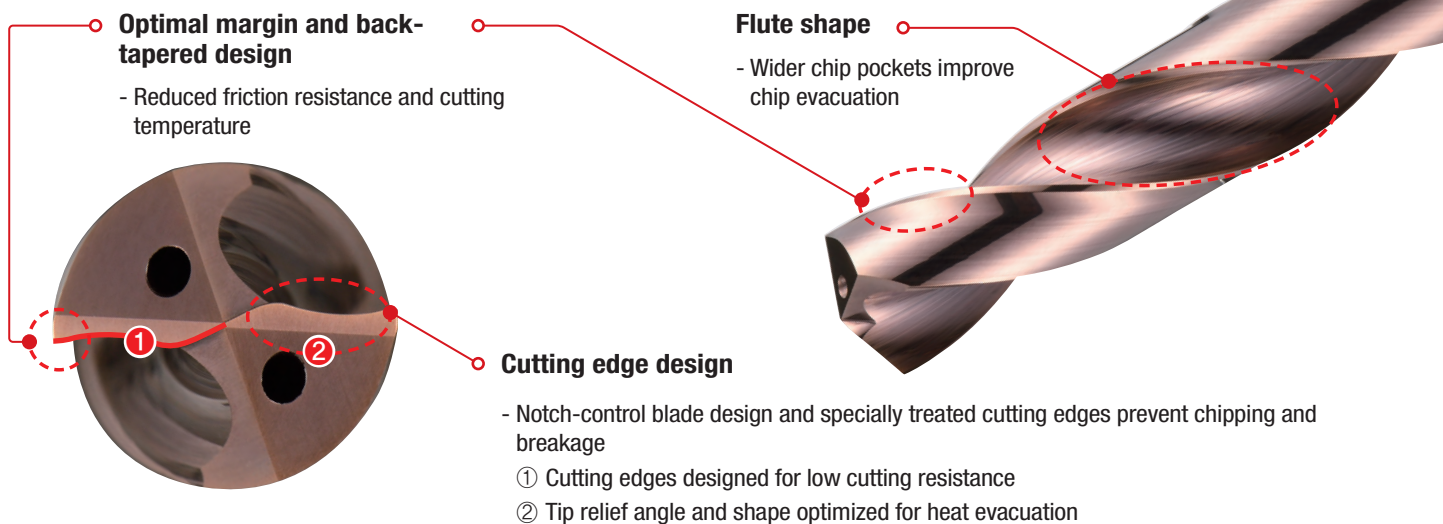
## Code system



## Features

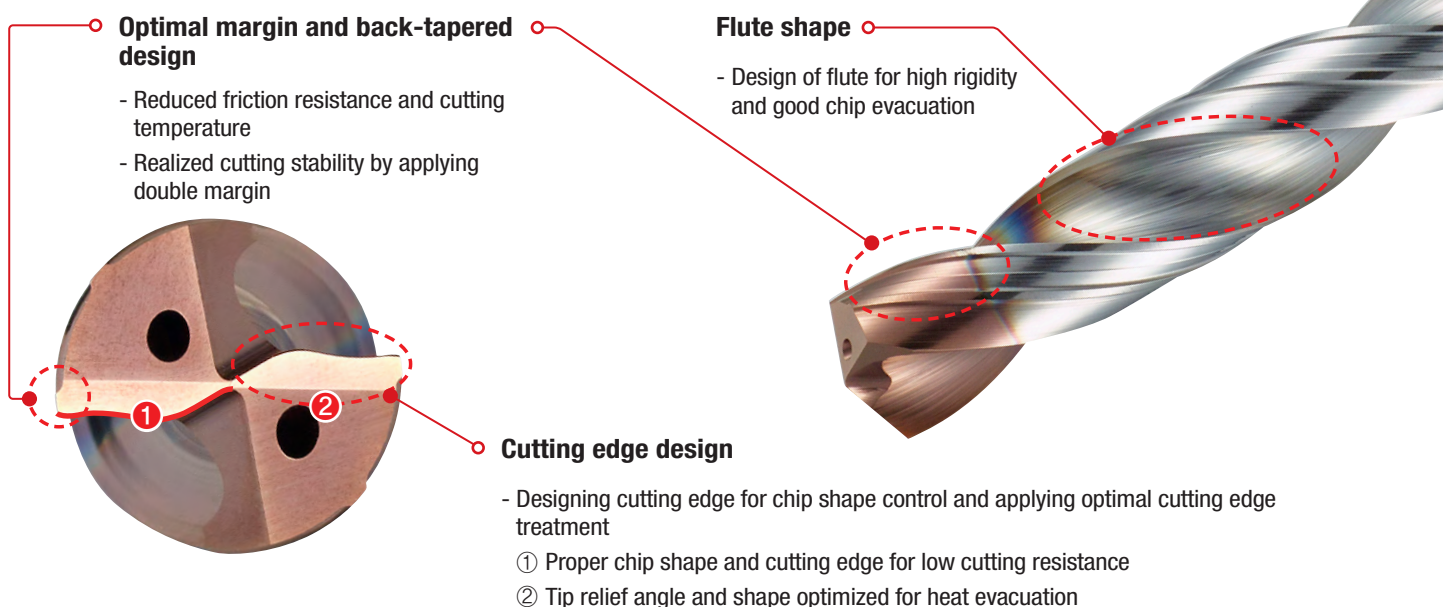
### 3D, 5D

- Specially prepared cutting edges and optimized blade design prevent chipping and sudden tool breakage
- Optimized tip flank design improves heat evacuation



### 8D, 10D *New*

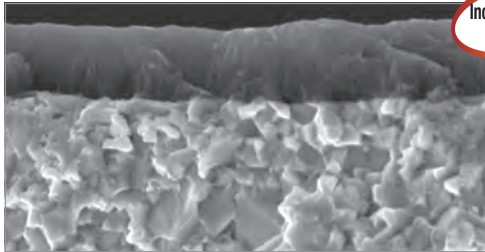
- Enhancing chip evacuation and preventing fracture of tool from proper design of flute for deep hole drilling



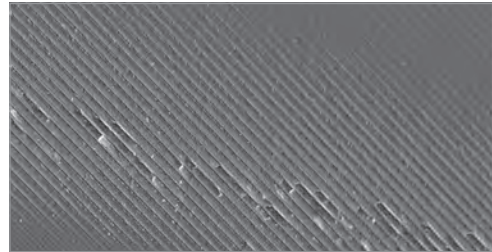
## Features

### The new 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
- Improved resistance to heat and oxidation thanks to the newly applied grade, PC325T



[ PC325T ]



[ Smooth coating surface ]

## Recommended cutting condition

ISO	Workpiece		Hardness (HrC)	Grade	Depth of cut	Cutting speed vc (m/min)	Feed rate (mm/rev) per Drill dia. (mm)			
	Workpiece material						Ø3.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	HRSA (INCONEL718 and etc.)	Fe-base	25~35	PC325T	3D, 5D	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
					8D, 10D	20~25	0.06~0.08	0.08~0.13	0.11~0.15	0.13~0.17
		Ni or Co base	35~45	PC325T	3D, 5D	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
					8D, 10D	15~20	0.05~0.07	0.07~0.12	0.10~0.14	0.12~0.16
	Titanium alloy (Ti-6Al-4V and etc.)	Pure titanium	10~15	PC325T	3D, 5D	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
					8D, 10D	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	3D, 5D	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21
					8D, 10D	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

※ The recommended cutting condition above is for applying internal coolant.

## Performance Evaluation

### Cutting load

**Workpiece** Inconel (Inconel718, HRC40~45)

**Cutting condition** vc(m/min)=20, fn(mm/rev)=0.09, ap(mm)=25, Wet

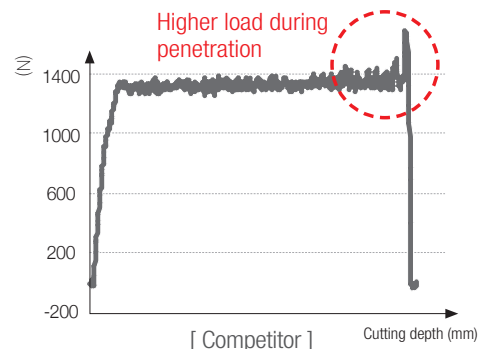
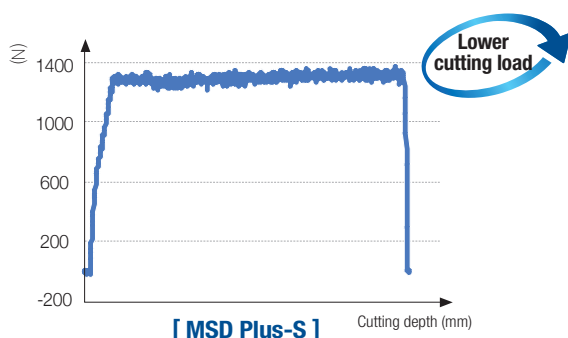
**Tool** MSDPH060-5S (Tool dia. =Ø6.0mm, PC325T)

—○— MSD Plus-S

Average thrust: 1300N, Standard deviation: 25

—○— Competitor

Average thrust : 1350N, Standard deviation: 45



## Performance Evaluation

### Surface roughness

<b>Workpiece</b>	Inconel (Inconel718, HRC40~45)
<b>Cutting condition</b>	vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 30, Wet
<b>Tool</b>	MSDPH100-5S (Tool dia. = Ø10.0mm, PC325T)



[ MSD Plus-S ]



[ Competitor ]

<b>Workpiece</b>	Titanium (Ti-6Al-4V, HRC42~47)
<b>Cutting condition</b>	vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 30, Wet
<b>Tool</b>	MSDPH100-5S (Tool dia. = Ø10.0mm, PC325T)



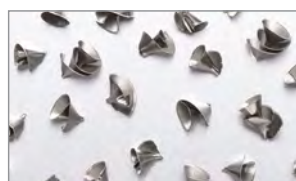
[ MSD Plus-S ]



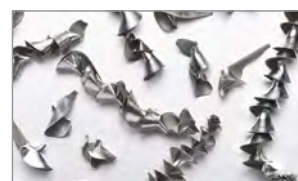
[ Competitor ]

### Chip control

<b>Workpiece</b>	Inconel (Inconel718, HRC40~45)
<b>Cutting condition</b>	vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 30, Wet
<b>Tool</b>	MSDPH100-5S (Tool dia. = Ø10.0mm, PC325T)



[ MSD Plus-S ]



[ Competitor ]

<b>Workpiece</b>	Titanium (Ti-6Al-4V, HRC42~47)
<b>Cutting condition</b>	vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 25, Wet
<b>Tool</b>	MSDPH100-5S (Tool dia. = Ø10.0mm, PC325T)



[ MSD Plus-S ]



[ Competitor ]

<b>Workpiece</b>	Titanium (Ti-6Al-4V, HRC50)
<b>Cutting condition</b>	vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 60, Wet
<b>Tool</b>	MSDPH060-10S (Tool dia. = Ø6.0mm, PC325T)



[ MSD Plus-S ]



[ Competitor ]

» Regular chip shape due to optimal cutting edge shape

## Application Examples

### Inconel718 (HRC40~45)

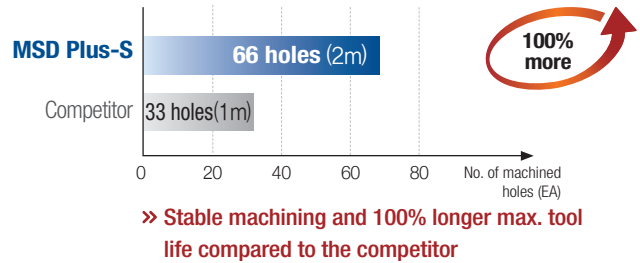
<b>Workpiece</b>	Aircraft parts (turbine disks, turbine shafts, etc.) and components used in the power generation industry
<b>Cutting condition</b>	vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 30, Wet
<b>Tool</b>	MSDPH060-5S (Tool dia. = Ø6.0mm)



[ MSD Plus-S ]



[ Competitor ]



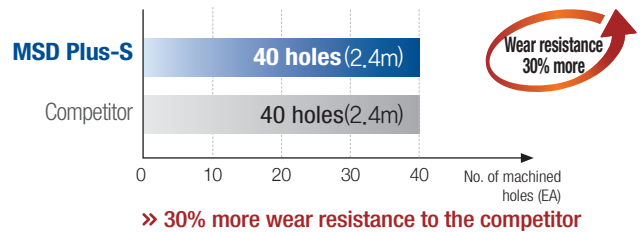
<b>Cutting condition</b>	vc (m/min) = 20, fn (mm/rev) = 0.09, ap (mm) = 60, Wet
<b>Tool</b> <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">New</span>	MSDPH060-10S (Tool dia. = Ø6.0mm)



[ MSD Plus-S ]



[ Competitor ]

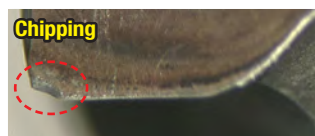


### Ti-6Al-4V (HRC42~47)

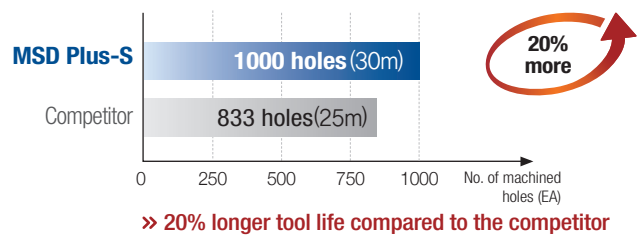
<b>Workpiece</b>	Aircraft parts (engines, engine housings and turbine disks) and components used in the power generation industry
<b>Cutting condition</b>	vc (m/min) = 40, fn (mm/rev) = 0.09, ap (mm) = 30, Wet
<b>Tool</b>	HSDPH060-5S (Tool dia. = Ø6.0mm)



[ MSD Plus-S ]



[ Competitor ]



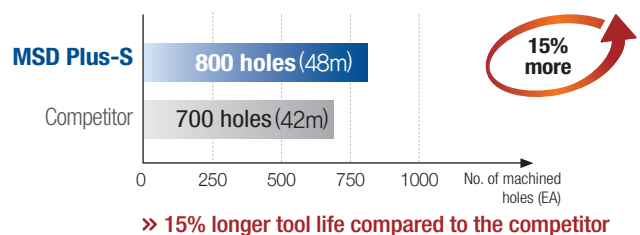
<b>Cutting condition</b>	vc (m/min) = 30, fn (mm/rev) = 0.09, ap (mm) = 60, Wet
<b>Tool</b> <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">New</span>	MSDPH060-10S (Tool dia. = Ø6.0mm)



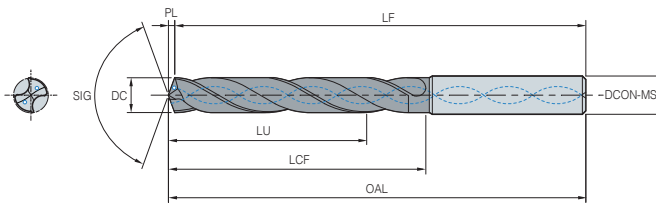
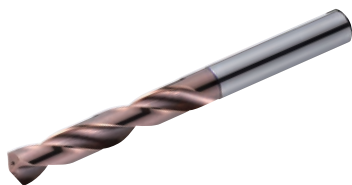
[ MSD Plus-S ]



[ 타사 ]



# MSDPH-S (3D, 5D)

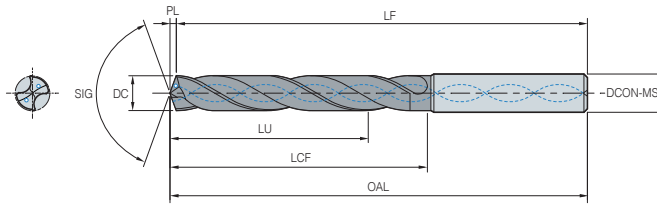
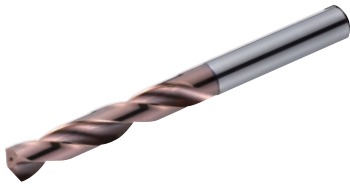


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	X Type
Coolant	Internal
Standard	DIN 6537
Shank Type	DIN 6535 HA

(mm)

Designation	DC	DCON-MS	3S					5S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 030-□S	3	6	9	20	61.5	62	0.5	15	28	65.5	66	0.5
031-□S	3.1	6	9.3	20	61.4	62	0.6	15.5	28	65.4	66	0.6
0318-□S	3.18	6	9.54	20	61.4	62	0.6	15.9	28	65.4	66	0.6
032-□S	3.2	6	9.6	20	61.4	62	0.6	16	28	65.4	66	0.6
033-□S	3.3	6	9.9	20	61.4	62	0.6	16.5	28	65.4	66	0.6
034-□S	3.4	6	10.2	20	61.4	62	0.6	17	28	65.4	66	0.6
035-□S	3.5	6	10.5	20	61.4	62	0.6	17.5	28	65.4	66	0.6
0357-□S	3.57	6	10.71	20	61.4	62	0.6	17.85	28	65.4	66	0.6
036-□S	3.6	6	10.8	20	61.3	62	0.7	18	28	65.3	66	0.7
037-□S	3.7	6	11.1	20	61.3	62	0.7	18.5	28	65.3	66	0.7
038-□S	3.8	6	11.4	24	65.3	66	0.7	19	36	73.3	74	0.7
039-□S	3.9	6	11.7	24	65.3	66	0.7	19.5	36	73.3	74	0.7
0397-□S	3.97	6	11.91	24	65.3	66	0.7	19.85	36	73.3	74	0.7
040-□S	4	6	12	24	65.3	66	0.7	20	36	73.3	74	0.7
041-□S	4.1	6	12.3	24	65.3	66	0.7	20.5	36	73.3	74	0.7
042-□S	4.2	6	12.6	24	65.2	66	0.8	21	36	73.2	74	0.8
043-□S	4.3	6	12.9	24	65.2	66	0.8	21.5	36	73.2	74	0.8
0437-□S	4.37	6	13.11	24	65.2	66	0.8	21.85	36	73.2	74	0.8
044-□S	4.4	6	13.2	24	65.2	66	0.8	22	36	73.2	74	0.8
045-□S	4.5	6	13.5	24	65.2	66	0.8	22.5	36	73.2	74	0.8
046-□S	4.6	6	13.8	24	65.2	66	0.8	23	36	73.2	74	0.8
047-□S	4.7	6	14.1	24	65.1	66	0.9	23.5	36	73.1	74	0.9
0476-□S	4.76	6	14.28	28	65.1	66	0.9	23.8	44	81.1	82	0.9
048-□S	4.8	6	14.4	28	65.1	66	0.9	24	44	81.1	82	0.9
049-□S	4.9	6	14.7	28	65.1	66	0.9	24.5	44	81.1	82	0.9
050-□S	5	6	15	28	65.1	66	0.9	25	44	81.1	82	0.9
051-□S	5.1	6	15.3	28	65.1	66	0.9	25.5	44	81.1	82	0.9
0516-□S	5.16	6	15.48	28	65.1	66	0.9	25.8	44	81.1	82	0.9
052-□S	5.2	6	15.6	28	65.1	66	0.9	26	44	81.1	82	0.9
053-□S	5.3	6	15.9	28	65.0	66	1.0	26.5	44	81.0	82	1.0
054-□S	5.4	6	16.2	28	65.0	66	1.0	27	44	81.0	82	1.0
055-□S	5.5	6	16.5	28	65.0	66	1.0	27.5	44	81.0	82	1.0
0556-□S	5.56	6	16.68	28	65.0	66	1.0	27.8	44	81.0	82	1.0
056-□S	5.6	6	16.8	28	65.0	66	1.0	28	44	81.0	82	1.0
057-□S	5.7	6	17.1	28	65.0	66	1.0	28.5	44	81.0	82	1.0
058-□S	5.8	6	17.4	28	64.9	66	1.1	29	44	80.9	82	1.1
059-□S	5.9	6	17.7	28	64.9	66	1.1	29.75	44	80.9	82	1.1
0595-□S	5.9	6	17.7	28	64.9	66	1.1	29.75	44	80.9	82	1.1
060-□S	6	6	18	28	64.9	66	1.1	30	44	80.9	82	1.1

# MSDPH-S (3D, 5D)

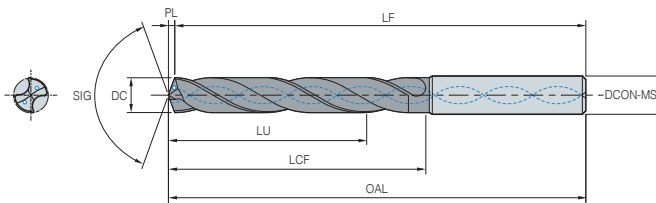
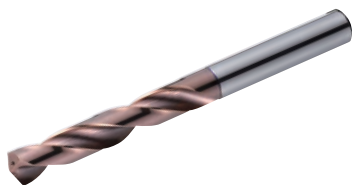


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	X Type
Coolant	Internal
Standard	DIN 6537
Shank Type	DIN 6535 HA

(mm)

Designation	DC	DCON-MS	3S					5S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 061-□S	6.1	8	18.3	34	77.9	79	1.1	30.5	53	89.9	91	1.1
062-□S	6.2	8	18.6	34	77.9	79	1.1	31	53	89.9	91	1.1
063-□S	6.3	8	18.9	34	77.9	79	1.1	31.5	53	89.9	91	1.1
0635-□S	6.35	8	19.05	34	77.8	79	1.2	31.75	53	89.8	91	1.2
064-□S	6.4	8	19.2	34	77.8	79	1.2	32	53	89.8	91	1.2
065-□S	6.5	8	19.5	34	77.8	79	1.2	32.5	53	89.8	91	1.2
066-□S	6.6	8	19.8	34	77.8	79	1.2	33	53	89.8	91	1.2
067-□S	6.7	8	20.1	34	77.8	79	1.2	33.5	53	89.8	91	1.2
0675-□S	6.75	8	20.25	34	77.8	79	1.2	33.75	53	89.8	91	1.2
068-□S	6.8	8	20.4	34	77.8	79	1.2	34	53	89.8	91	1.2
069-□S	6.9	8	20.7	34	77.7	79	1.3	34.5	53	89.7	91	1.3
070-□S	7	8	21	34	77.7	79	1.3	35	53	89.7	91	1.3
071-□S	7.1	8	21.3	41	77.7	79	1.3	35.5	53	89.7	91	1.3
0714-□S	7.14	8	21.42	41	77.7	79	1.3	35.7	53	89.7	91	1.3
072-□S	7.2	8	21.6	41	77.7	79	1.3	36	53	89.7	91	1.3
073-□S	7.3	8	21.9	41	77.7	79	1.3	36.5	53	89.7	91	1.3
074-□S	7.4	8	22.2	41	77.7	79	1.3	37	53	89.7	91	1.3
075-□S	7.5	8	22.5	41	77.6	79	1.4	37.5	53	89.6	91	1.4
0754-□S	7.54	8	22.62	41	77.6	79	1.4	37.7	53	89.6	91	1.4
076-□S	7.6	8	22.8	41	77.6	79	1.4	38	53	89.6	91	1.4
077-□S	7.7	8	23.1	41	77.6	79	1.4	38.5	53	89.6	91	1.4
078-□S	7.8	8	23.4	41	77.6	79	1.4	39	53	89.6	91	1.4
079-□S	7.9	8	23.7	41	77.6	79	1.4	39.5	53	89.6	91	1.4
0794-□S	7.94	8	23.82	41	77.6	79	1.4	39.7	53	89.6	91	1.4
080-□S	8	8	24	41	77.5	79	1.5	40	53	89.5	91	1.5
081-□S	8.1	10	24.3	47	87.5	89	1.5	40.5	61	101.5	103	1.5
082-□S	8.2	10	24.6	47	87.5	89	1.5	41	61	101.5	103	1.5
083-□S	8.3	10	24.9	47	87.5	89	1.5	41.5	61	101.5	103	1.5
0833-□S	8.33	10	24.99	47	87.5	89	1.5	41.65	61	101.5	103	1.5
084-□S	8.4	10	25.2	47	87.5	89	1.5	42	61	101.5	103	1.5
085-□S	8.5	10	25.5	47	87.5	89	1.5	42.5	61	101.5	103	1.5
086-□S	8.6	10	25.8	47	87.4	89	1.6	43	61	101.4	103	1.6
087-□S	8.7	10	26.1	47	87.4	89	1.6	43.5	61	101.4	103	1.6
0873-□S	8.73	10	26.19	47	87.4	89	1.6	43.65	61	101.4	103	1.6
088-□S	8.8	10	26.4	47	87.4	89	1.6	44	61	101.4	103	1.6
089-□S	8.9	10	26.7	47	87.4	89	1.6	44.5	61	101.4	103	1.6
090-□S	9	10	27	47	87.4	89	1.6	45	61	101.4	103	1.6
091-□S	9.1	10	27.3	47	87.3	89	1.7	45.5	61	101.3	103	1.7
0913-□S	9.13	10	27.39	47	87.3	89	1.7	45.65	61	101.3	103	1.7

# MSDPH-S (3D, 5D)

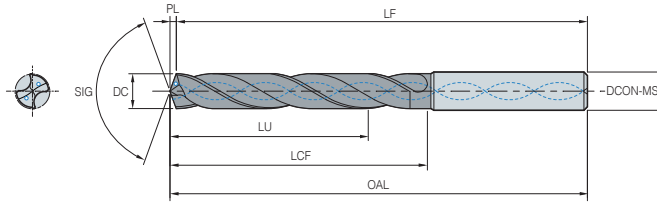
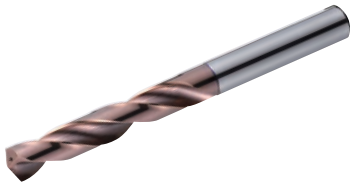


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	X Type
Coolant	Internal
Standard	DIN 6537
Shank Type	DIN 6535 HA

(mm)

Designation	DC	DCON-MS	3S					5S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 092-□S	9.2	10	27.6	47	87.3	89	1.7	46	61	101.3	103	1.7
093-□S	9.3	10	27.9	47	87.3	89	1.7	46.5	61	101.3	103	1.7
094-□S	9.4	10	28.2	47	87.3	89	1.7	47	61	101.3	103	1.7
095-□S	9.5	10	28.5	47	87.3	89	1.7	47.5	61	101.3	103	1.7
0953-□S	9.53	10	28.59	47	87.3	89	1.7	47.65	61	101.3	103	1.7
096-□S	9.6	10	28.8	47	87.3	89	1.7	48	61	101.3	103	1.7
097-□S	9.7	10	29.1	47	87.2	89	1.8	48.5	61	101.2	103	1.8
098-□S	9.8	10	29.4	47	87.2	89	1.8	49	61	101.2	103	1.8
099-□S	9.9	10	29.7	47	87.2	89	1.8	49.5	61	101.2	103	1.8
0992-□S	9.92	10	29.76	47	87.2	89	1.8	49.6	61	101.2	103	1.8
100-□S	10	10	30	47	87.2	89	1.8	50	61	101.2	103	1.8
101-□S	10.1	12	30.3	55	100.2	102	1.8	50.5	71	116.2	118	1.8
102-□S	10.2	12	30.6	55	100.1	102	1.9	51	71	116.1	118	1.9
103-□S	10.3	12	30.9	55	100.1	102	1.9	51.5	71	116.1	118	1.9
1032-□S	10.32	12	30.96	55	100.1	102	1.9	51.6	71	116.1	118	1.9
104-□S	10.4	12	31.2	55	100.1	102	1.9	52	71	116.1	118	1.9
105-□S	10.5	12	31.5	55	100.1	102	1.9	52.5	71	116.1	118	1.9
106-□S	10.6	12	31.8	55	100.1	102	1.9	53	71	116.1	118	1.9
107-□S	10.7	12	32.1	55	100.1	102	1.9	53.5	71	116.1	118	1.9
1072-□S	10.72	12	32.16	55	100.0	102	2.0	53.6	71	116.0	118	2.0
108-□S	10.8	12	32.4	55	100.0	102	2.0	54	71	116.0	118	2.0
109-□S	10.9	12	32.7	55	100.0	102	2.0	54.5	71	116.0	118	2.0
110-□S	11	12	33	55	100.0	102	2.0	55	71	116.0	118	2.0
111-□S	11.1	12	33.3	55	100.0	102	2.0	55.5	71	116.0	118	2.0
1111-□S	11.11	12	33.33	55	100.0	102	2.0	55.55	71	116.0	118	2.0
112-□S	11.2	12	33.6	55	100.0	102	2.0	56	71	116.0	118	2.0
113-□S	11.3	12	33.9	55	99.9	102	2.1	56.5	71	115.9	118	2.1
114-□S	11.4	12	34.2	55	99.9	102	2.1	57	71	115.9	118	2.1
115-□S	11.5	12	34.5	55	99.9	102	2.1	57.5	71	115.9	118	2.1
1151-□S	11.51	12	34.53	55	99.9	102	2.1	57.55	71	115.9	118	2.1
116-□S	11.6	12	34.8	55	99.9	102	2.1	58	71	115.9	118	2.1
117-□S	11.7	12	35.1	55	99.9	102	2.1	58.5	71	115.9	118	2.1
118-□S	11.8	12	35.4	55	99.9	102	2.1	59	71	115.9	118	2.1
119-□S	11.9	12	35.7	55	99.8	102	2.2	59.5	71	115.8	118	2.2
1191-□S	11.91	12	35.73	55	99.8	102	2.2	59.55	71	115.8	118	2.2
120-□S	12	12	36	55	99.8	102	2.2	60	71	115.8	118	2.2
121-□S	12.1	14	36.3	60	104.8	107	2.2	60.5	77	121.8	124	2.2
122-□S	12.2	14	36.6	60	104.8	107	2.2	61	77	121.8	124	2.2
123-□S	12.3	14	36.9	60	104.8	107	2.2	61.5	77	121.8	124	2.2

# MSDPH-S (3D, 5D)

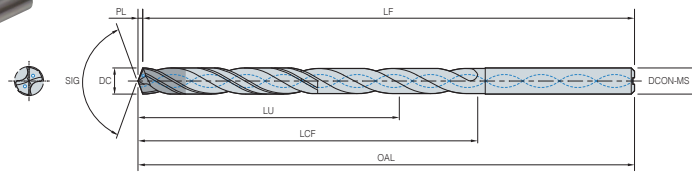


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	X Type
Coolant	Internal
Standard	DIN 6537
Shank Type	DIN 6535 HA

(mm)

Designation	DC	DCON-MS	3S					5S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 124-□S	12.4	14	37.2	60	104.7	107	2.3	62	77	121.7	124	2.3
125-□S	12.5	14	37.5	60	104.7	107	2.3	62.5	77	121.7	124	2.3
126-□S	12.6	14	37.8	60	104.7	107	2.3	63	77	121.7	124	2.3
127-□S	12.7	14	38.1	60	104.7	107	2.3	63.5	77	121.7	124	2.3
128-□S	12.8	14	38.4	60	104.7	107	2.3	64	77	121.7	124	2.3
129-□S	12.9	14	38.7	60	104.7	107	2.3	64.5	77	121.7	124	2.3
130-□S	13	14	39	60	104.6	107	2.4	65	77	121.6	124	2.4
131-□S	13.1	14	39.3	60	104.6	107	2.4	65.5	77	121.6	124	2.4
132-□S	13.2	14	39.6	60	104.6	107	2.4	66	77	121.6	124	2.4
133-□S	13.3	14	39.9	60	104.6	107	2.4	66.5	77	121.6	124	2.4
134-□S	13.4	14	40.2	60	104.6	107	2.4	67	77	121.6	124	2.4
1349-□S	13.49	14	40.47	60	104.5	107	2.5	67.45	77	121.5	124	2.5
135-□S	13.5	14	40.5	60	104.5	107	2.5	67.5	77	121.5	124	2.5
136-□S	13.6	14	40.8	60	104.5	107	2.5	68	77	121.5	124	2.5
137-□S	13.7	14	41.1	60	104.5	107	2.5	68.5	77	121.5	124	2.5
138-□S	13.8	14	41.4	60	104.5	107	2.5	69	77	121.5	124	2.5
139-□S	13.9	14	41.7	60	104.5	107	2.5	69.5	77	121.5	124	2.5
140-□S	14	14	42	60	104.5	107	2.5	70	77	121.5	124	2.5
141-□S	14.1	16	42.3	65	112.4	115	2.6	70.5	83	130.4	133	2.6
142-□S	14.2	16	42.6	65	112.4	115	2.6	71	83	130.4	133	2.6
1429-□S	14.29	16	42.87	65	112.4	115	2.6	71.45	83	130.4	133	2.6
143-□S	14.3	16	42.9	65	112.4	115	2.6	71.5	83	130.4	133	2.6
144-□S	14.4	16	43.2	65	112.4	115	2.6	72	83	130.4	133	2.6
145-□S	14.5	16	43.5	65	112.4	115	2.6	72.5	83	130.4	133	2.6
146-□S	14.6	16	43.8	65	112.3	115	2.7	73	83	130.3	133	2.7
147-□S	14.7	16	44.1	65	112.3	115	2.7	73.5	83	130.3	133	2.7
148-□S	14.8	16	44.4	65	112.3	115	2.7	74	83	130.3	133	2.7
149-□S	14.9	16	44.7	65	112.3	115	2.7	74.5	83	130.3	133	2.7
150-□S	15	16	45	65	112.3	115	2.7	75	83	130.3	133	2.7
151-□S	15.1	16	45.3	65	112.3	115	2.7	75.5	83	130.3	133	2.7
152-□S	15.2	16	45.6	65	112.2	115	2.8	76	83	130.2	133	2.8
153-□S	15.3	16	45.9	65	112.2	115	2.8	76.5	83	130.2	133	2.8
154-□S	15.4	16	46.2	65	112.2	115	2.8	77	83	130.2	133	2.8
155-□S	15.5	16	46.5	65	112.2	115	2.8	77.5	83	130.2	133	2.8
156-□S	15.6	16	46.8	65	112.2	115	2.8	78	83	130.2	133	2.8
157-□S	15.7	16	47.1	65	112.1	115	2.9	78.5	83	130.1	133	2.9
158-□S	15.8	16	47.4	65	112.1	115	2.9	79	83	130.1	133	2.9
1587-□S	15.87	16	47.61	65	112.1	115	2.9	79.35	83	130.1	133	2.9
159-□S	15.9	16	47.7	65	112.1	115	2.9	79.5	83	130.1	133	2.9
160-□S	16	16	48	65	112.1	115	2.9	80	88	130.1	133	2.9

# MSDPH-S (8D, 10D) New

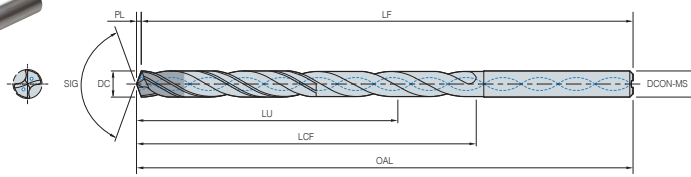


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	XR Type
Coolant	Internal

(mm)

Designation	DC	DCON-MS	8S					10S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 030-□S	3	3	24	33	82.5	83	0.5	30	39	88.5	89	0.5
031-□S	3.1	4	24.8	38	93.4	94	0.6	31	45	101.4	102	0.6
0318-□S	3.18	4	25.44	38	93.4	94	0.6	31.8	45	101.4	102	0.6
032-□S	3.2	4	25.6	38	93.4	94	0.6	32	45	101.4	102	0.6
033-□S	3.3	4	26.4	38	93.4	94	0.6	33	45	101.4	102	0.6
034-□S	3.4	4	27.2	38	93.4	94	0.6	34	45	101.4	102	0.6
035-□S	3.5	4	28	38	93.4	94	0.6	35	45	101.4	102	0.6
0357-□S	3.57	4	28.56	44	93.4	94	0.6	35.7	52	101.4	102	0.6
036-□S	3.6	4	28.8	44	93.3	94	0.7	36	52	101.3	102	0.7
037-□S	3.7	4	29.6	44	93.3	94	0.7	37	52	101.3	102	0.7
038-□S	3.8	4	30.4	44	93.3	94	0.7	38	52	101.3	102	0.7
039-□S	3.9	4	31.2	44	93.3	94	0.7	39	52	101.3	102	0.7
0397-□S	3.97	4	31.76	44	93.3	94	0.7	39.7	52	101.3	102	0.7
040-□S	4	4	32	44	93.3	94	0.7	40	52	101.3	102	0.7
041-□S	4.1	5	32.8	49	104.3	105	0.7	41	58	114.3	115	0.7
042-□S	4.2	5	33.6	49	104.2	105	0.8	42	58	114.2	115	0.8
043-□S	4.3	5	34.4	49	104.2	105	0.8	43	58	114.2	115	0.8
0437-□S	4.37	5	34.96	49	104.2	105	0.8	43.7	58	114.2	115	0.8
044-□S	4.4	5	35.2	49	104.2	105	0.8	44	58	114.2	115	0.8
045-□S	4.5	5	36	49	104.2	105	0.8	45	58	114.2	115	0.8
046-□S	4.6	5	36.8	55	104.2	105	0.8	46	65	114.2	115	0.8
047-□S	4.7	5	37.6	55	104.1	105	0.9	47	65	114.1	115	0.9
0476-□S	4.76	5	38.08	55	104.1	105	0.9	47.6	65	114.1	115	0.9
048-□S	4.8	5	38.4	55	104.1	105	0.9	48	65	114.1	115	0.9
049-□S	4.9	5	39.2	55	104.1	105	0.9	49	65	114.1	115	0.9
050-□S	5	5	40	55	104.1	105	0.9	50	65	114.1	115	0.9
051-□S	5.1	6	40.8	60	115.1	116	0.9	51	71	127.1	128	0.9
0516-□S	5.16	6	41.28	60	115.1	116	0.9	51.6	71	127.1	128	0.9
052-□S	5.2	6	41.6	60	115.1	116	0.9	52	71	127.1	128	0.9
053-□S	5.3	6	42.4	60	115.0	116	1.0	53	71	127.0	128	1.0
054-□S	5.4	6	43.2	60	115.0	116	1.0	54	71	127.0	128	1.0
055-□S	5.5	6	44	60	115.0	116	1.0	55	71	127.0	128	1.0
0556-□S	5.56	6	44.48	66	115.0	116	1.0	55.6	78	127.0	128	1.0
056-□S	5.6	6	44.8	66	115.0	116	1.0	56	78	127.0	128	1.0
057-□S	5.7	6	45.6	66	115.0	116	1.0	57	78	127.0	128	1.0
058-□S	5.8	6	46.4	66	114.9	116	1.1	58	78	126.9	128	1.1
0595-□S	5.95	6	47.6	66	114.9	116	1.1	59.5	78	126.9	128	1.1
059-□S	5.95	6	47.6	66	114.9	116	1.1	59.5	78	126.9	128	1.1
060-□S	6	6	48	66	114.9	116	1.1	60	78	126.9	128	1.1

# MSDPH-S (8D, 10D) New

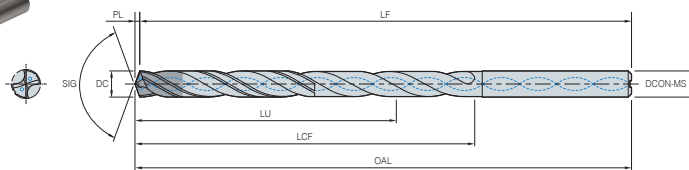


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	XR Type
Coolant	Internal

(mm)

Designation	DC	DCON-MS	8S					10S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 061-□S	6.1	7	48.8	71	125.9	127	1.1	61	84	139.9	141	1.1
062-□S	6.2	7	49.6	71	125.9	127	1.1	62	84	139.9	141	1.1
063-□S	6.3	7	50.4	71	125.9	127	1.1	63	84	139.9	141	1.1
0635-□S	6.35	7	50.8	71	125.8	127	1.2	63.5	84	139.8	141	1.2
064-□S	6.4	7	51.2	71	125.8	127	1.2	64	84	139.8	141	1.2
065-□S	6.5	7	52	71	125.8	127	1.2	65	84	139.8	141	1.2
066-□S	6.6	7	52.8	77	125.8	127	1.2	66	91	139.8	141	1.2
067-□S	6.7	7	53.6	77	125.8	127	1.2	67	91	139.8	141	1.2
0675-□S	6.75	7	54	77	125.8	127	1.2	67.5	91	139.8	141	1.2
068-□S	6.8	7	54.4	77	125.8	127	1.2	68	91	139.8	141	1.2
069-□S	6.9	7	55.2	77	125.7	127	1.3	69	91	139.7	141	1.3
070-□S	7	7	56	77	125.7	127	1.3	70	91	139.7	141	1.3
071-□S	7.1	8	56.8	82	136.7	138	1.3	71	97	152.7	154	1.3
0714-□S	7.14	8	57.12	82	136.7	138	1.3	71.4	97	152.7	154	1.3
072-□S	7.2	8	57.6	82	136.7	138	1.3	72	97	152.7	154	1.3
073-□S	7.3	8	58.4	82	136.7	138	1.3	73	97	152.7	154	1.3
074-□S	7.4	8	59.2	82	136.7	138	1.3	74	97	152.7	154	1.3
075-□S	7.5	8	60	82	136.6	138	1.4	75	97	152.6	154	1.4
0754-□S	7.54	8	60.32	88	136.6	138	1.4	75.4	104	152.6	154	1.4
076-□S	7.6	8	60.8	88	136.6	138	1.4	76	104	152.6	154	1.4
077-□S	7.7	8	61.6	88	136.6	138	1.4	77	104	152.6	154	1.4
078-□S	7.8	8	62.4	88	136.6	138	1.4	78	104	152.6	154	1.4
079-□S	7.9	8	63.2	88	136.6	138	1.4	79	104	152.6	154	1.4
0794-□S	7.94	8	63.52	88	136.6	138	1.4	79.4	104	152.6	154	1.4
080-□S	8	8	64	88	136.5	138	1.5	80	104	152.5	154	1.5
081-□S	8.1	9	64.8	93	147.5	149	1.5	81	110	165.5	167	1.5
082-□S	8.2	9	65.6	93	147.5	149	1.5	82	110	165.5	167	1.5
083-□S	8.3	9	66.4	93	147.5	149	1.5	83	110	165.5	167	1.5
0833-□S	8.33	9	66.64	93	147.5	149	1.5	83.3	110	165.5	167	1.5
084-□S	8.4	9	67.2	93	147.5	149	1.5	84	110	165.5	167	1.5
085-□S	8.5	9	68	93	147.5	149	1.5	85	110	165.5	167	1.5
086-□S	8.6	9	68.8	99	147.4	149	1.6	86	117	165.4	167	1.6
087-□S	8.7	9	69.6	99	147.4	149	1.6	87	117	165.4	167	1.6
0873-□S	8.73	9	69.84	99	147.4	149	1.6	87.3	117	165.4	167	1.6
088-□S	8.8	9	70.4	99	147.4	149	1.6	88	117	165.4	167	1.6
089-□S	8.9	9	71.2	99	147.4	149	1.6	89	117	165.4	167	1.6
090-□S	9	9	72	99	147.4	149	1.6	90	117	165.4	167	1.6
091-□S	9.1	10	72.8	110	168.3	170	1.7	91	130	188.3	190	1.7
0913-□S	9.13	10	73.04	110	168.3	170	1.7	91.3	130	188.3	190	1.7

# MSDPH-S (8D, 10D) New

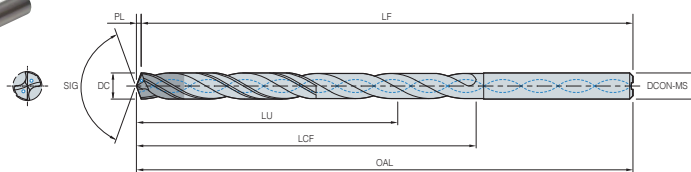


Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	XR Type
Coolant	Internal

(mm)

Designation	DC	DCON-MS	8S					10S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 092-□S	9.2	10	73.6	110	168.3	170	1.7	92	130	188.3	190	1.7
093-□S	9.3	10	74.4	110	168.3	170	1.7	93	130	188.3	190	1.7
094-□S	9.4	10	75.2	110	168.3	170	1.7	94	130	188.3	190	1.7
095-□S	9.5	10	76	110	168.3	170	1.7	95	130	188.3	190	1.7
0953-□S	9.53	10	76.24	110	168.3	170	1.7	95.3	130	188.3	190	1.7
096-□S	9.6	10	76.8	110	168.3	170	1.7	96	130	188.3	190	1.7
097-□S	9.7	10	77.6	110	168.2	170	1.8	97	130	188.2	190	1.8
098-□S	9.8	10	78.4	110	168.2	170	1.8	98	130	188.2	190	1.8
099-□S	9.9	10	79.2	110	168.2	170	1.8	99	130	188.2	190	1.8
0992-□S	9.92	10	79.36	110	168.2	170	1.8	99.2	130	188.2	190	1.8
100-□S	10	10	80	110	168.2	170	1.8	100	130	188.2	190	1.8
101-□S	10.1	11	80.8	121	179.2	181	1.8	101	143	201.2	203	1.8
102-□S	10.2	11	81.6	121	179.1	181	1.9	102	143	201.1	203	1.9
103-□S	10.3	11	82.4	121	179.1	181	1.9	103	143	201.1	203	1.9
1032-□S	10.32	11	82.56	121	179.1	181	1.9	103.2	143	201.1	203	1.9
104-□S	10.4	11	83.2	121	179.1	181	1.9	104	143	201.1	203	1.9
105-□S	10.5	11	84	121	179.1	181	1.9	105	143	201.1	203	1.9
106-□S	10.6	11	84.8	121	179.1	181	1.9	106	143	201.1	203	1.9
107-□S	10.7	11	85.6	121	179.1	181	1.9	107	143	201.1	203	1.9
1072-□S	10.72	11	85.76	121	179.0	181	2.0	107.2	143	201.0	203	2.0
108-□S	10.8	11	86.4	121	179.0	181	2.0	108	143	201.0	203	2.0
109-□S	10.9	11	87.2	121	179.0	181	2.0	109	143	201.0	203	2.0
110-□S	11	11	88	121	179.0	181	2.0	110	143	201.0	203	2.0
111-□S	11.1	12	88.8	132	190.0	192	2.0	111	156	214.0	216	2.0
1111-□S	11.11	12	88.88	132	190.0	192	2.0	111.1	156	214.0	216	2.0
112-□S	11.2	12	89.6	132	190.0	192	2.0	112	156	214.0	216	2.0
113-□S	11.3	12	90.4	132	189.9	192	2.1	113	156	213.9	216	2.1
114-□S	11.4	12	91.2	132	189.9	192	2.1	114	156	213.9	216	2.1
115-□S	11.5	12	92	132	189.9	192	2.1	115	156	213.9	216	2.1
1151-□S	11.51	12	92.08	132	189.9	192	2.1	115.1	156	213.9	216	2.1
116-□S	11.6	12	92.8	132	189.9	192	2.1	116	156	213.9	216	2.1
117-□S	11.7	12	93.6	132	189.9	192	2.1	117	156	213.9	216	2.1
118-□S	11.8	12	94.4	132	189.9	192	2.1	118	156	213.9	216	2.1
119-□S	11.9	12	95.2	132	189.8	192	2.2	119	156	213.8	216	2.2
1191-□S	11.91	12	95.28	132	189.8	192	2.2	119.1	156	213.8	216	2.2
120-□S	12	12	96	132	189.8	192	2.2	120	156	213.8	216	2.2
121-□S	12.1	13	96.8	143	200.8	203	2.2	121	169	226.8	229	2.2
122-□S	12.2	13	97.6	143	200.8	203	2.2	122	169	226.8	229	2.2
123-□S	12.3	13	98.4	143	200.8	203	2.2	123	169	226.8	229	2.2

# MSDPH-S (8D, 10D) New



Terminology	S
Coated	PC325T
Tolerance (Drill dia.)	h7
Tolerance (Shank dia.)	h6
SIG	140°
Twist angle	30°
Thinning	XR Type
Coolant	Internal

(mm)

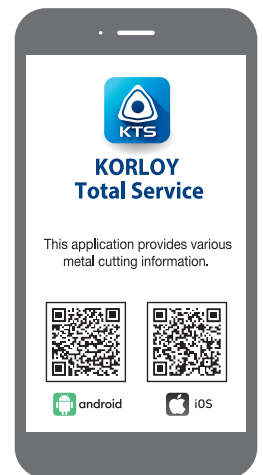
Designation	DC	DCON-MS	8S					10S				
			LU	LCF	LF	OAL	PL	LU	LCF	LF	OAL	PL
<b>MSDPH</b> 124-□S	12.4	13	99.2	143	200.7	203	2.3	124	169	226.7	229	2.3
125-□S	12.5	13	100	143	200.7	203	2.3	125	169	226.7	229	2.3
126-□S	12.6	13	100.8	143	200.7	203	2.3	126	169	226.7	229	2.3
127-□S	12.7	13	101.6	143	200.7	203	2.3	127	169	226.7	229	2.3
128-□S	12.8	13	102.4	143	200.7	203	2.3	128	169	226.7	229	2.3
129-□S	12.9	13	103.2	143	200.7	203	2.3	129	169	226.7	229	2.3
130-□S	13	13	104	143	200.6	203	2.4	130	169	226.6	229	2.4
131-□S	13.1	14	104.8	154	211.6	214	2.4	131	182	239.6	242	2.4
132-□S	13.2	14	105.6	154	211.6	214	2.4	132	182	239.6	242	2.4
133-□S	13.3	14	106.4	154	211.6	214	2.4	133	182	239.6	242	2.4
134-□S	13.4	14	107.2	154	211.6	214	2.4	134	182	239.6	242	2.4
1349-□S	13.49	14	107.92	154	211.5	214	2.5	134.9	182	239.5	242	2.5
135-□S	13.5	14	108	154	211.5	214	2.5	135	182	239.5	242	2.5
136-□S	13.6	14	108.8	154	211.5	214	2.5	136	182	239.5	242	2.5
137-□S	13.7	14	109.6	154	211.5	214	2.5	137	182	239.5	242	2.5
138-□S	13.8	14	110.4	154	211.5	214	2.5	138	182	239.5	242	2.5
139-□S	13.9	14	111.2	154	211.5	214	2.5	139	182	239.5	242	2.5
140-□S	14	14	112	154	211.5	214	2.5	140	182	239.5	242	2.5
141-□S	14.1	15	112.8	165	222.4	225	2.6	141	195	252.4	255	2.6
142-□S	14.2	15	113.6	165	222.4	225	2.6	142	195	252.4	255	2.6
1429-□S	14.29	15	114.32	165	222.4	225	2.6	142.9	195	252.4	255	2.6
143-□S	14.3	15	114.4	165	222.4	225	2.6	143	195	252.4	255	2.6
144-□S	14.4	15	115.2	165	222.4	225	2.6	144	195	252.4	255	2.6
145-□S	14.5	15	116	165	222.4	225	2.6	145	195	252.4	255	2.6
146-□S	14.6	15	116.8	165	222.3	225	2.7	146	195	252.3	255	2.7
147-□S	14.7	15	117.6	165	222.3	225	2.7	147	195	252.3	255	2.7
148-□S	14.8	15	118.4	165	222.3	225	2.7	148	195	252.3	255	2.7
149-□S	14.9	15	119.2	165	222.3	225	2.7	149	195	252.3	255	2.7
150-□S	15	15	120	165	222.3	225	2.7	150	195	252.3	255	2.7
151-□S	15.1	16	120.8	176	233.3	236	2.7	151	208	265.3	268	2.7
152-□S	15.2	16	121.6	176	233.2	236	2.8	152	208	265.2	268	2.8
153-□S	15.3	16	122.4	176	233.2	236	2.8	153	208	265.2	268	2.8
154-□S	15.4	16	123.2	176	233.2	236	2.8	154	208	265.2	268	2.8
155-□S	15.5	16	124	176	233.2	236	2.8	155	208	265.2	268	2.8
156-□S	15.6	16	124.8	176	233.2	236	2.8	156	208	265.2	268	2.8
157-□S	15.7	16	125.6	176	233.1	236	2.9	157	208	265.1	268	2.9
158-□S	15.8	16	126.4	176	233.1	236	2.9	158	208	265.1	268	2.9
1587-□S	15.87	16	126.96	176	233.1	236	2.9	158.7	208	265.1	268	2.9
159-□S	15.9	16	127.2	176	233.1	236	2.9	159	208	265.1	268	2.9
160-□S	16	16	128	176	233.1	236	2.9	160	208	265.1	268	2.9

### ⚠ For the safe metalcutting

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



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