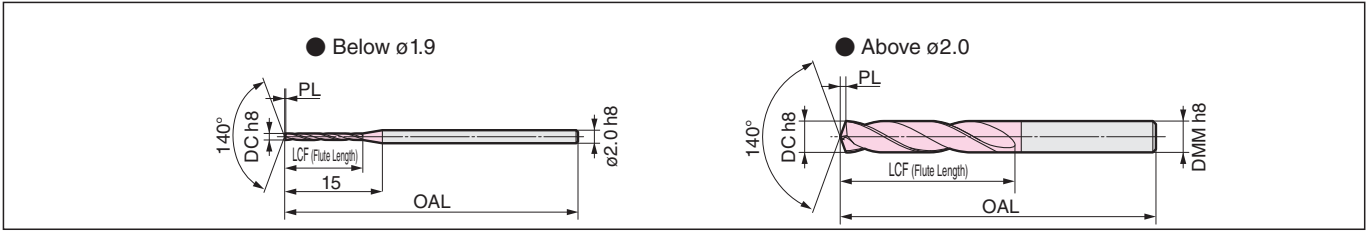


External Coolant Supply/Standard type

Carbon Steel	Alloy Steel	Tempered Steel	Hardened Steel	Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP	ZX Coat	3D
Up to 0.28%	From 0.28%	Steel	Up to 60HRC	From 40HRC									



Body Diameter  $\phi$ 1.0 to 6.5mm

Diameter DC (mm)	Hole Depth (L/D)	Stock	Cat. No.	Dimensions (mm)				Shank DMM (mm)
				Effective Length LU	Flute Length LCF	Total length OAL	Tip PL	
1.0	3	●	MDS 010MD	6.7	12.2	45.2	0.2	2.0
1.1	3		011MD	7.2	13.2	45.2	0.2	2.0
1.2	3	●	012MD	7.6	14.2	45.2	0.2	2.0
1.3	3		013MD	8.1	14.2	45.2	0.2	2.0
1.4	3	●	014MD	8.6	15.3	45.3	0.3	2.0
1.5	3	●	015MD	9.1	15.3	45.3	0.3	2.0
1.6	3	●	016MD	9.5	15.3	45.3	0.3	2.0
1.7	3		017MD	10.0	15.3	45.3	0.3	2.0
1.8	3	●	018MD	10.4	15.3	45.3	0.3	2.0
1.9	3		019MD	10.9	15.3	45.3	0.3	2.0
2.0	3	●	020MD	11.4	15.4	45.4	0.4	2.0
2.1	3		MDS 021MD	11.9	15.4	45.4	0.4	2.1
2.2	3	●	022MD	12.3	16.4	46.4	0.4	2.2
2.3	3		023MD	12.8	16.4	46.4	0.4	2.3
2.4	3	●	024MD	13.2	17.4	47.4	0.4	2.4
2.5	3	●	025MD	13.8	17.5	47.5	0.5	2.5
2.6	3	●	026MD	14.2	17.5	47.5	0.5	2.6
2.7	3		027MD	14.7	19.5	49.5	0.5	2.7
2.8	3	●	028MD	15.1	19.5	49.5	0.5	2.8
2.9	3		029MD	15.6	19.5	49.5	0.5	2.9
3.0	3	●	030MD	16.0	19.5	49.5	0.5	3.0
3.1	3		MDS 031MD	16.6	21.6	52.6	0.6	3.1
3.2	3	●	032MD	17.0	21.6	52.6	0.6	3.2
3.3	3		033MD	17.5	21.6	52.6	0.6	3.3
3.4	3	●	034MD	17.9	24.6	56.6	0.6	3.4
3.5	3	●	035MD	18.4	24.6	56.6	0.6	3.5
3.6	3	●	036MD	18.9	24.7	56.7	0.7	3.6
3.7	3		037MD	19.4	24.7	56.7	0.7	3.7
3.8	3	●	038MD	19.8	27.7	60.7	0.7	3.8
3.9	3		039MD	20.3	27.7	60.7	0.7	3.9
4.0	3	●	040MD	20.7	27.7	60.7	0.7	4.0
4.1	3		MDS 041MD	21.2	27.7	60.7	0.7	4.1
4.2	3	●	042MD	21.7	27.8	60.8	0.8	4.2
4.3	3	●	043MD	22.2	31.8	65.8	0.8	4.3
4.4	3	●	044MD	22.6	31.8	65.8	0.8	4.4
4.5	3	●	045MD	23.1	31.8	65.8	0.8	4.5
4.6	3	●	046MD	23.5	31.8	65.8	0.8	4.6
4.7	3		047MD	24.1	31.9	65.9	0.9	4.7
4.8	3	●	048MD	24.5	33.9	69.9	0.9	4.8
4.9	3		049MD	25.0	33.9	69.9	0.9	4.9
5.0	3	●	050MD	25.4	38.9	76.9	0.9	5.0
5.1	3	●	MDS 051MD	25.9	38.9	76.9	0.9	5.1
5.2	3	●	052MD	26.3	38.9	76.9	0.9	5.2
5.3	3		053MD	26.9	39.0	77.0	1.0	5.3
5.4	3	●	054MD	27.3	39.0	77.0	1.0	5.4
5.5	3	●	055MD	27.8	39.0	77.0	1.0	5.5
5.6	3	●	056MD	28.2	42.0	82.0	1.0	5.6
5.7	3		057MD	28.7	42.0	82.0	1.0	5.7
5.8	3	●	058MD	29.2	42.1	82.1	1.1	5.8
5.9	3		059MD	29.7	42.1	82.1	1.1	5.9
6.0	3	●	060MD	30.1	42.1	82.1	1.1	6.0
6.1	3		MDS 061MD	30.6	42.1	82.1	1.1	6.1
6.2	3		062MD	31.0	42.1	82.1	1.1	6.2
6.3	3		063MD	31.5	42.1	82.1	1.1	6.3
6.4	3		064MD	32.0	42.2	82.2	1.2	6.4
6.5	3	●	065MD	32.5	42.2	82.2	1.2	6.5

Body Diameter  $\phi$ 6.6 to 12.1mm

Diameter DC (mm)	Hole Depth (L/D)	Stock	Cat. No.	Dimensions (mm)				Shank DMM (mm)
				Effective Length LU	Flute Length LCF	Total length OAL	Tip PL	
6.6	3		MDS 066MD	32.9	44.2	84.2	1.2	6.6
6.7	3		067MD	33.4	44.2	84.2	1.2	6.7
6.8	3	●	068MD	33.8	44.2	84.2	1.2	6.8
6.9	3		069MD	34.4	44.3	84.3	1.3	6.9
7.0	3	●	070MD	34.8	44.3	84.3	1.3	7.0
7.1	3		MDS 071MD	35.3	46.3	88.3	1.3	7.1
7.2	3		072MD	35.7	46.3	88.3	1.3	7.2
7.3	3		073MD	36.2	46.3	88.3	1.3	7.3
7.4	3		074MD	36.6	46.3	88.3	1.3	7.4
7.5	3	●	075MD	37.2	46.4	88.4	1.4	7.5
7.6	3		076MD	37.6	49.4	91.4	1.4	7.6
7.7	3		077MD	38.1	49.4	91.4	1.4	7.7
7.8	3		078MD	38.5	49.4	91.4	1.4	7.8
7.9	3		079MD	39.0	49.4	91.4	1.4	7.9
8.0	3	●	080MD	39.5	49.5	91.5	1.5	8.0
8.1	3		MDS 081MD	40.0	54.5	97.5	1.5	8.1
8.2	3		082MD	40.4	54.5	97.5	1.5	8.2
8.3	3		083MD	40.9	54.5	97.5	1.5	8.3
8.4	3		084MD	41.3	54.5	97.5	1.5	8.4
8.5	3	●	085MD	41.8	54.5	97.5	1.5	8.5
8.6	3	●	086MD	42.3	56.6	99.6	1.6	8.6
8.7	3		087MD	42.8	56.6	99.6	1.6	8.7
8.8	3		088MD	43.2	56.6	99.6	1.6	8.8
8.9	3		089MD	43.7	56.6	99.6	1.6	8.9
9.0	3	●	090MD	44.1	56.6	99.6	1.6	9.0
9.1	3		MDS 091MD	44.7	59.7	103.7	1.7	9.1
9.2	3		092MD	45.1	59.7	103.7	1.7	9.2
9.3	3		093MD	45.6	59.7	103.7	1.7	9.3
9.4	3		094MD	46.0	59.7	103.7	1.7	9.4
9.5	3	●	095MD	46.5	59.7	103.7	1.7	9.5
9.6	3		096MD	46.9	61.7	106.7	1.7	9.6
9.7	3		097MD	47.5	61.8	106.8	1.8	9.7
9.8	3		098MD	47.9	61.8	106.8	1.8	9.8
9.9	3		099MD	48.4	61.8	106.8	1.8	9.9
10.0	3	●	100MD	48.8	61.8	106.8	1.8	10.0
10.1	3		MDS 101MD	49.3	67.8	113.8	1.8	10.1
10.2	3		102MD	49.8	67.9	113.9	1.9	10.2
10.3	3	●	103MD	50.3	67.9	113.9	1.9	10.3
10.4	3		104MD	50.7	67.9	113.9	1.9	10.4
10.5	3	●	105MD	51.2	67.9	113.9	1.9	10.5
10.6	3		106MD	51.6	69.9	115.9	1.9	10.6
10.7	3		107MD	52.1	69.9	115.9	1.9	10.7
10.8	3		108MD	52.6	70.0	116.0	2.0	10.8
10.9	3		109MD	53.1	70.0	116.0	2.0	10.9
11.0	3	●	110MD	53.5	70.0	116.0	2.0	11.0
11.1	3		MDS 111MD	54.0	73.0	120.0	2.0	11.1
11.2	3		112MD	54.4	73.0	120.0	2.0	11.2
11.3	3		113MD	55.0	73.1	120.1	2.1	11.3
11.4	3		114MD	55.4	73.1	120.1	2.1	11.4
11.5	3	●	115MD	55.9	73.1	120.1	2.1	11.5
11.6	3		116MD	56.3	75.1	123.1	2.1	11.6
11.7	3		117MD	56.8	75.1	123.1	2.1	11.7
11.8	3		118MD	57.2	75.1	123.1	2.1	11.8
11.9	3		119MD	57.8	75.2	123.2	2.2	11.9
12.0	3	●	120MD	58.2	75.2	123.2	2.2	12.0
12.1	3		MDS 121MD	58.7	78.2	137.2	2.2	12.1

Grade: ACZ51S

Grade: ACZ51S

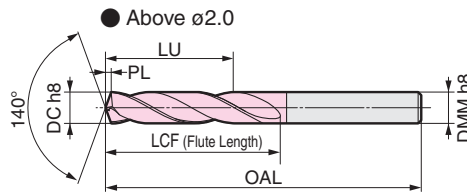


# Super MultiDrill D Type

D Type

External Coolant Supply/Standard type

Carbon Steel, Alloy Steel Up to 0.2% C, From 0.2% C	Tempered Steel	Hardened Steel Up to 45HRC, From 48HRC	Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
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## Body Diameter ø12.2 to 16.1mm

Diameter DC (mm)	Hole Depth (L/D)	Stock	Cat. No.	Dimensions (mm)				Shank DMM (mm)
				Effective Length LU	Flute Length LCF	Total length OAL	Tip PL	
12.2	3		MDS 122MD	59.1	78.2	137.2	2.2	12.2
12.3	3		123MD	59.6	78.2	137.2	2.2	12.3
12.4	3		124MD	60.1	78.3	137.3	2.3	12.4
12.5	3	●	125MD	60.6	78.3	137.3	2.3	12.5
12.6	3	●	126MD	61.0	80.3	139.3	2.3	12.6
12.7	3		127MD	61.5	80.3	139.3	2.3	12.7
12.8	3		128MD	61.9	80.3	139.3	2.3	12.8
12.9	3		129MD	62.4	80.3	139.3	2.3	12.9
13.0	3	●	130MD	62.9	80.4	139.4	2.4	13.0
13.1	3		MDS 131MD	63.4	86.4	146.4	2.4	13.1
13.2	3		132MD	63.8	86.4	146.4	2.4	13.2
13.3	3		133MD	64.3	86.4	146.4	2.4	13.3
13.4	3		134MD	64.7	86.4	146.4	2.4	13.4
13.5	3	●	135MD	65.3	86.5	146.5	2.5	13.5
13.6	3		136MD	65.7	88.5	149.5	2.5	13.6
13.7	3		137MD	66.2	88.5	149.5	2.5	13.7
13.8	3		138MD	66.6	88.5	149.5	2.5	13.8
13.9	3		139MD	67.1	88.5	149.5	2.5	13.9
14.0	3	●	140MD	67.5	88.5	149.5	2.5	14.0
14.1	3	●	MDS 141MD	68.1	91.6	153.6	2.6	14.1
14.2	3		142MD	68.5	91.6	153.6	2.6	14.2
14.3	3		143MD	69.0	91.6	153.6	2.6	14.3
14.4	3		144MD	69.4	91.6	153.6	2.6	14.4
14.5	3	●	145MD	69.9	91.6	153.6	2.6	14.5
14.6	3	●	146MD	70.4	93.7	155.7	2.7	14.6
14.7	3		147MD	70.9	93.7	155.7	2.7	14.7
14.8	3		148MD	71.3	93.7	155.7	2.7	14.8
14.9	3		149MD	71.8	93.7	155.7	2.7	14.9
15.0	3	●	150MD	72.2	93.7	155.7	2.7	15.0
15.1	3		MDS 151MD	72.7	96.7	159.7	2.7	15.1
15.2	3		152MD	73.2	96.8	159.8	2.8	15.2
15.3	3		153MD	73.7	96.8	159.8	2.8	15.3
15.4	3		154MD	74.1	96.8	159.8	2.8	15.4
15.5	3	●	155MD	74.6	96.8	159.8	2.8	15.5
15.6	3	●	156MD	75.0	98.8	162.8	2.8	15.6
15.7	3		157MD	75.6	98.9	162.9	2.9	15.7
15.8	3		158MD	76.0	98.9	162.9	2.9	15.8
15.9	3		159MD	76.5	98.9	162.9	2.9	15.9
16.0	3	●	160MD	76.9	98.9	162.9	2.9	16.0
16.1	3	●	MDS 161MD	77.4	104.9	169.9	2.9	16.1

Grade: ACZ51S

## Body Diameter ø16.2 to 20.0mm

Diameter DC (mm)	Hole Depth (L/D)	Stock	Cat. No.	Dimensions (mm)				Shank DMM (mm)
				Effective Length LU	Flute Length LCF	Total length OAL	Tip PL	
16.2	3		MDS 162MD	77.8	104.9	169.9	2.9	16.2
16.3	3		163MD	78.4	105.0	170.0	3.0	16.3
16.4	3		164MD	78.8	105.0	170.0	3.0	16.4
16.5	3		165MD	79.3	105.0	170.0	3.0	16.5
16.6	3		166MD	79.7	105.0	170.0	3.0	16.6
16.7	3		167MD	80.2	105.0	170.0	3.0	16.7
16.8	3		168MD	80.7	105.1	170.1	3.1	16.8
16.9	3		169MD	81.2	105.1	170.1	3.1	16.9
17.0	3		170MD	81.6	105.1	170.1	3.1	17.0
17.1	3		MDS 171MD	82.1	105.1	170.1	3.1	17.1
17.2	3		172MD	82.5	105.1	170.1	3.1	17.2
17.3	3		173MD	83.0	105.1	170.1	3.1	17.3
17.4	3		174MD	83.5	105.2	170.2	3.2	17.4
17.5	3		175MD	84.0	105.2	170.2	3.2	17.5
17.6	3		176MD	84.4	105.2	170.2	3.2	17.6
17.7	3		177MD	84.9	105.2	170.2	3.2	17.7
17.8	3		178MD	85.3	105.2	170.2	3.2	17.8
17.9	3		179MD	85.9	105.3	170.3	3.3	17.9
18.0	3		180MD	86.3	105.3	170.3	3.3	18.0
18.1	3		MDS 181MD	86.8	117.3	182.3	3.3	18.1
18.2	3		182MD	87.2	117.3	182.3	3.3	18.2
18.3	3		183MD	87.7	117.3	182.3	3.3	18.3
18.4	3		184MD	88.1	117.3	182.3	3.3	18.4
18.5	3		185MD	88.7	117.4	182.4	3.4	18.5
18.6	3		186MD	89.1	117.4	182.4	3.4	18.6
18.7	3		187MD	89.6	117.4	182.4	3.4	18.7
18.8	3		188MD	90.0	117.4	182.4	3.4	18.8
18.9	3		189MD	90.5	117.4	182.4	3.4	18.9
19.0	3		190MD	91.0	117.5	182.5	3.5	19.0
19.1	3		MDS 191MD	91.5	117.5	182.5	3.5	19.1
19.2	3		192MD	91.9	117.5	182.5	3.5	19.2
19.3	3		193MD	92.4	117.5	182.5	3.5	19.3
19.4	3		194MD	92.8	117.5	182.5	3.5	19.4
19.5	3		195MD	93.3	117.5	182.5	3.5	19.5
19.6	3		196MD	93.8	117.6	182.6	3.6	19.6
19.7	3		197MD	94.3	117.6	182.6	3.6	19.7
19.8	3		198MD	94.7	117.6	182.6	3.6	19.8
19.9	3		199MD	95.2	117.6	182.6	3.6	19.9
20.0	3		200MD	95.6	117.6	182.6	3.6	20.0

Grade: ACZ51S

## Recommended Cutting Conditions (D Type)

(v<sub>c</sub>: Cutting Speed m/min f: Feed Rate mm/rev)

Drill Diameter DC (mm)	Cutting Conditions	Hardened Steel		Ti Alloy 6Al-4V-Ti	Inconel Inco718
		(Up to 45HRC)	(Up to 60HRC)		
Up to ø3.0	v <sub>c</sub>	20 - 30 - 40	10 - 15 - 20	10 - 10 - 25	10 - 10 - 25
	f	0.06 - 0.07 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
Up to ø5.0	v <sub>c</sub>	20 - 30 - 40	10 - 15 - 20	10 - 10 - 25	10 - 10 - 25
	f	0.08 - 0.09 - 0.10	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
Up to ø10.0	v <sub>c</sub>	20 - 30 - 40	10 - 15 - 20	10 - 15 - 30	10 - 15 - 30
	f	0.10 - 0.12 - 0.15	0.06 - 0.08 - 0.10	0.07 - 0.09 - 0.10	0.07 - 0.09 - 0.10
Up to ø16.0	v <sub>c</sub>	20 - 30 - 40	10 - 15 - 20	10 - 15 - 30	10 - 15 - 30
	f	0.10 - 0.13 - 0.15	0.08 - 0.10 - 0.12	0.07 - 0.09 - 0.10	0.07 - 0.09 - 0.10
Up to ø20.0	v <sub>c</sub>	20 - 30 - 40	10 - 15 - 20	10 - 15 - 30	10 - 15 - 30
	f	0.10 - 0.13 - 0.15	0.08 - 0.10 - 0.12	0.07 - 0.09 - 0.10	0.07 - 0.09 - 0.10

Min. - Optimum - Max.

Drilling  
Solid  
Special  
Indexable  
Reamer  
Brazed  
Others