

Solid Carbide Drill for Machining Heat Resistant Alloys

DSA Series

New
Products

Long Tool Life Even with Super Heat Resistant Alloys

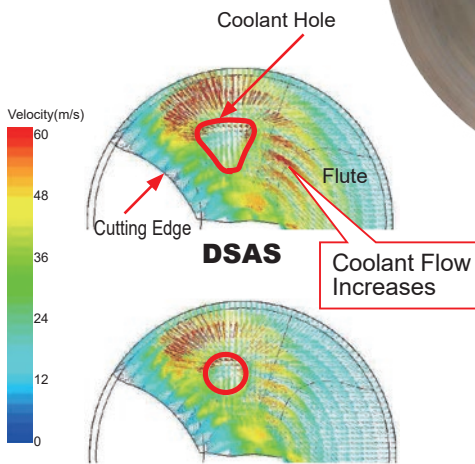


Solid Carbide Drill for Machining Heat Resistant Alloys

DSA Series

TRI-Cooling Technology

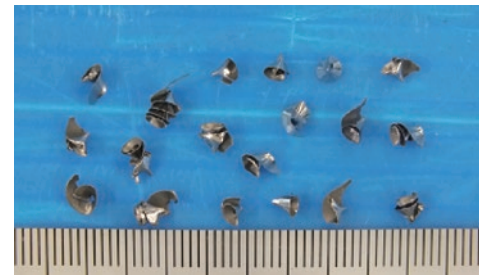
The unique hole geometry increases the coolant flow rate, resulting in high lubricity and cooling effect. (available in sizes over : 5mm)



Comparison of Coolant Flow Rate (Spindle Speed 4700 min⁻¹)

Straight Cutting Edge with Single-Pass Honing

The tough straight cutting edge with single-pass honing enables stable chip formation as well as preventing the cutting edge from chipping.



DSAS



Conventional

New Grade for Machining of Heat Resistant Alloys DP9020

New hard grade provides both high wear and fracture resistance, leading to longer tool life.

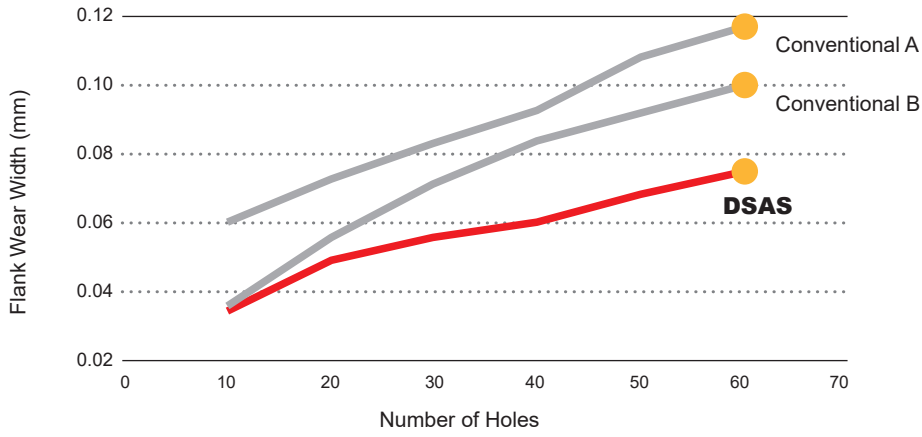
Special Margin

The specially designed thin margin minimizes contact area with hole surface and workpiece materials in combination with tri-cooling technology to reduce cutting heat and prevent the generation of work-hardening making it especially suited for the machining of heat resistant alloys.

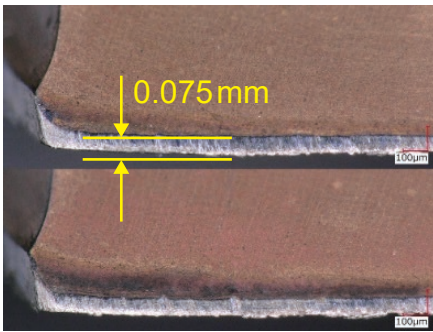


Cutting Performance

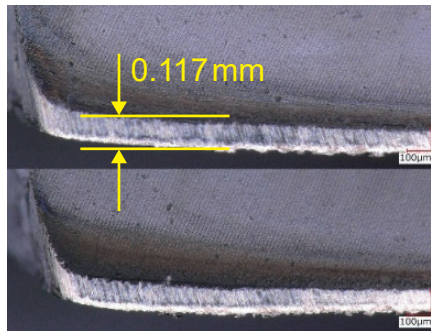
Comparison of Flank Wear Width by Inconel 718



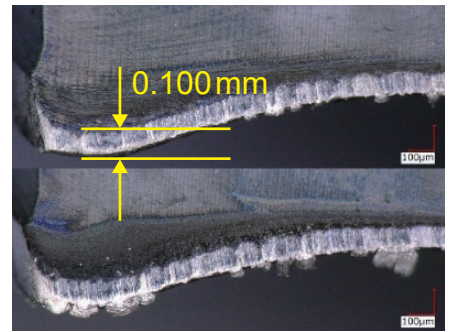
<Cutting Conditions>
 Workpiece Material : Inconel 718
 Tool : DSAS0700X03S080
 Drill Dia. : DC=7 mm
 Hole Depth : 12 mm (l= DCx 1.7)
 Cutting Speed : vc= 15 m/min
 Feed per Rev. : fr= 0.1 mm/rev.
 Cutting Mode : Internal Coolant
 (Water-soluble Coolants)
 Machine : Vertical MC



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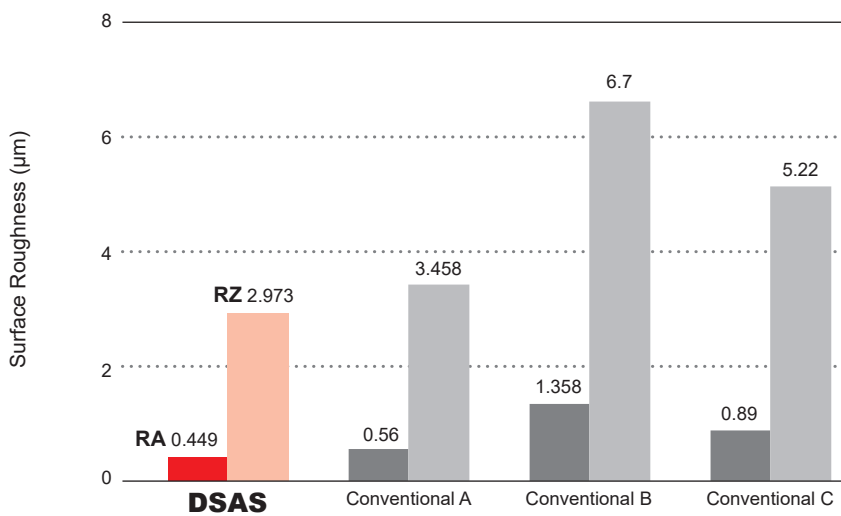


Conventional A



Conventional B

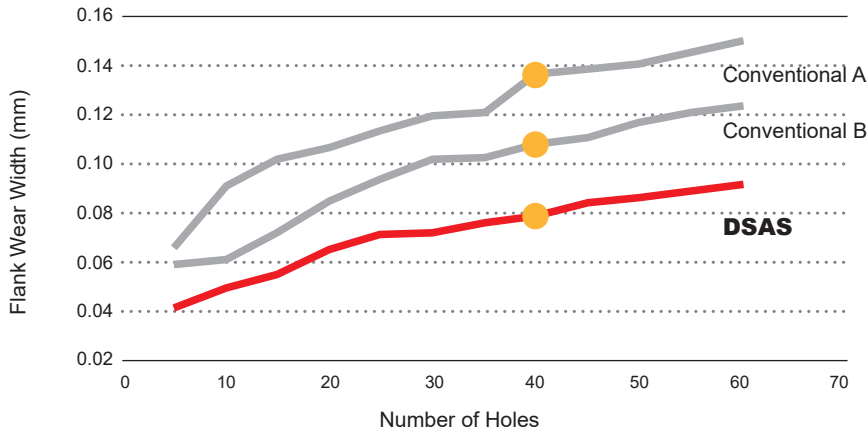
Comparison of Wall Surface Roughness by Inconel 718



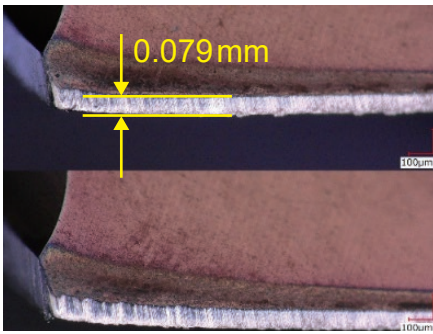
<Cutting Conditions>
 Workpiece Material : Inconel 718
 Tool : DSAS0700X03S080
 Drill Dia. : DC=7 mm
 Hole Depth : 10 mm (l= DCx 1.4)
 Cutting Speed : vc=15m/min
 Feed per Rev. : fr= 0.1 mm/rev.
 Cutting Mode : Internal Coolant
 (Water-soluble Coolants)
 Machine : Vertical MC

Cutting Performance

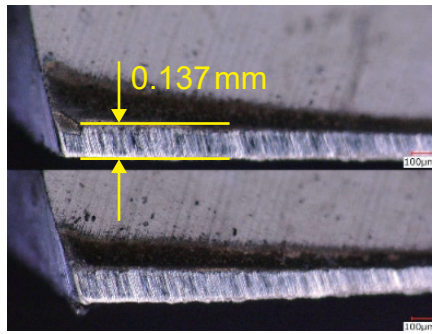
Comparison of Flank Wear Width by RENE 41



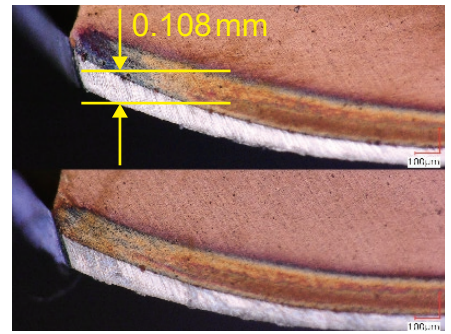
<Cutting Conditions>
 Workpiece Material : RENE 41
 Tool : DSAS0690X03S080
 Drill Dia. : DC=6.9mm
 Hole Depth : 10 mm (= DCx 1.4)
 Cutting Speed : vc=15 m/min
 Feed per Rev. : fr=0.1 mm/rev.
 Cutting Mode : Internal Coolant
 (Water-soluble Coolants)
 Machine : Vertical MC



DSAS

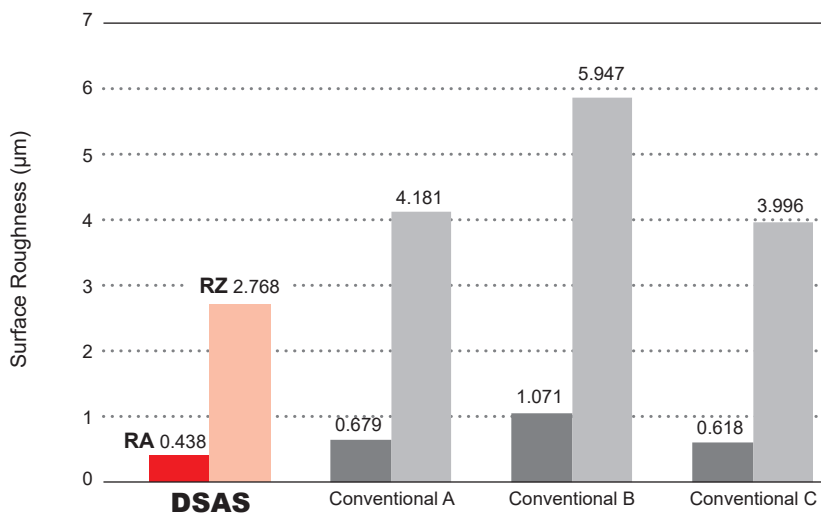


Conventional A



Conventional B

Comparison of Wall Surface Roughness by RENE 41



<Cutting Conditions>
 Workpiece Material : RENE 41
 Tool : DSAS0690X03S080
 Drill Dia. : DC=6.9mm
 Hole Depth : 10 mm (= DCx 1.4)
 Cutting Speed : vc=15 m/min
 Feed per Rev. : fr=0.1 mm/rev.
 Cutting Mode : Internal Coolant
 (Water-soluble Coolants)
 Machine : Vertical MC

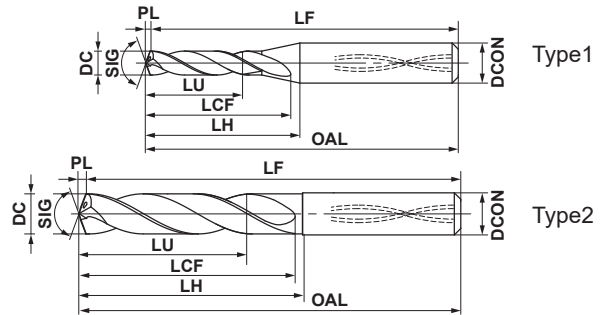
Solid Carbide Drill for Machining Heat Resistant Alloys

DSAS



P M K N **S** H

Internal Coolant



	DC=3	3<DC≤6	6<DC≤10	10<DC≤12	
	⁰ / _{-0.018}	⁰ / _{-0.018}	⁰ / _{-0.022}	⁰ / _{-0.027}	
	DCON=6	6<DCON≤10	DCON=12		
	⁰ / _{-0.018}	⁰ / _{-0.009}	⁰ / _{-0.011}		



*When looking at the coating the color can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC	L/D	DP9020	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
3.00	3	●	DSAS0300X03S060	9.5	21.5	23.5	70.5	70	0.5	6	1
3.18	3	●	DSAS0318X03S060	10.1	21.6	23.6	70.6	70	0.6	6	1
3.30	3	●	DSAS0330X03S060	10.5	21.6	23.6	70.6	70	0.6	6	1
3.40	3	●	DSAS0340X03S060	10.8	21.6	23.6	70.6	70	0.6	6	1
3.50	3	●	DSAS0350X03S060	11.1	21.6	23.6	70.6	70	0.6	6	1
3.57	3	●	DSAS0357X03S060	11.4	22.7	23.7	70.7	70	0.7	6	1
3.97	3	●	DSAS0397X03S060	12.6	22.7	23.7	70.7	70	0.7	6	1
4.00	3	●	DSAS0400X03S060	12.7	22.7	23.7	70.7	70	0.7	6	1
4.10	3	●	DSAS0410X03S060	13.0	24.7	26.7	73.7	73	0.7	6	1
4.20	3	○	DSAS0420X03S060	13.4	24.8	26.8	73.8	73	0.8	6	1
4.30	3	●	DSAS0430X03S060	13.7	24.8	26.8	73.8	73	0.8	6	1
4.37	3	●	DSAS0437X03S060	13.9	24.8	26.8	73.8	73	0.8	6	1
4.50	3	●	DSAS0450X03S060	14.3	24.8	26.8	73.8	73	0.8	6	1
4.70	3	●	DSAS0470X03S060	15.0	25.9	28.9	75.9	75	0.9	6	1
4.76	3	●	DSAS0476X03S060	15.2	25.9	28.9	75.9	75	0.9	6	1
5.00	3	●	DSAS0500X03S060	15.9	28.9	29.9	81.9	81	0.9	6	2
5.10	3	●	DSAS0510X03S060	16.2	28.9	29.9	81.9	81	0.9	6	2
5.16	3	●	DSAS0516X03S060	16.5	29.0	30.0	82.0	81	1.0	6	2
5.40	3	●	DSAS0540X03S060	17.2	29.0	30.0	82.0	81	1.0	6	2
5.50	3	●	DSAS0550X03S060	17.5	29.0	30.0	82.0	81	1.0	6	2
5.56	3	●	DSAS0556X03S060	17.8	31.1	31.1	82.1	81	1.1	6	2
5.60	3	●	DSAS0560X03S060	17.9	31.1	31.1	82.1	81	1.1	6	2
5.80	3	●	DSAS0580X03S060	18.5	31.1	31.1	82.1	81	1.1	6	2
5.90	3	○	DSAS0590X03S060	18.8	31.1	31.1	82.1	81	1.1	6	2
5.95	3	●	DSAS0595X03S060	19.0	31.1	31.1	82.1	81	1.1	6	2
6.00	3	●	DSAS0600X03S060	19.1	31.1	31.1	82.1	81	1.1	6	2
6.10	3	●	DSAS0610X03S080	19.5	34.2	37.2	87.2	86	1.2	8	2
6.20	3	●	DSAS0620X03S080	19.8	34.2	37.2	87.2	86	1.2	8	2
6.35	3	●	DSAS0635X03S080	20.3	34.2	37.2	87.2	86	1.2	8	2
6.40	3	●	DSAS0640X03S080	20.4	34.2	37.2	87.2	86	1.2	8	2
6.50	3	●	DSAS0650X03S080	20.7	34.2	37.2	87.2	86	1.2	8	2
6.60	3	●	DSAS0660X03S080	21.1	36.3	38.3	91.3	90	1.3	8	2

Note 1) The coolant hole of ø5mm or less will be round shape.

DC = Cutting Diameter LH = Neck Length PL = Point Length
 LU = Usable Length OAL = Overall Length DCON = Connection Diameter
 LCF = Length Chip Flute LF = Functional Length

● : Inventory maintained in Japan. ○ : Inventory maintained in Japan. (Scheduled to be released this winter)

Solid Carbide Drill for Machining Heat Resistant Alloys

DSAS

(mm)

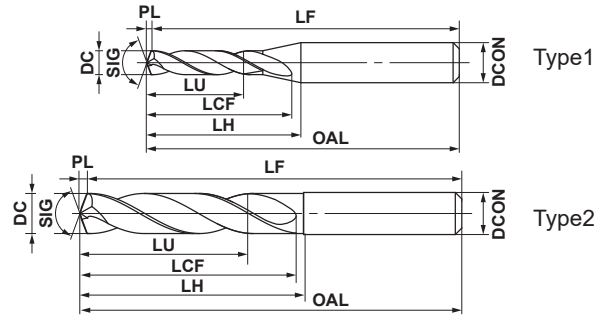
DC	L/D	DP9020	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
6.75	3	●	DSAS0675X03S080	21.5	36.3	38.3	91.3	90	1.3	8	2
6.80	3	●	DSAS0680X03S080	21.7	36.3	38.3	91.3	90	1.3	8	2
6.90	3	●	DSAS0690X03S080	22.0	36.3	38.3	91.3	90	1.3	8	2
7.00	3	●	DSAS0700X03S080	22.3	36.3	38.3	91.3	90	1.3	8	2
7.10	3	●	DSAS0710X03S080	22.7	39.4	40.4	91.4	90	1.4	8	2
7.14	3	●	DSAS0714X03S080	22.8	39.4	40.4	91.4	90	1.4	8	2
7.20	3	●	DSAS0720X03S080	23.0	39.4	40.4	91.4	90	1.4	8	2
7.40	3	●	DSAS0740X03S080	23.6	39.4	40.4	91.4	90	1.4	8	2
7.50	3	●	DSAS0750X03S080	23.9	39.4	40.4	91.4	90	1.4	8	2
7.54	3	●	DSAS0754X03S080	24.1	41.5	41.5	91.5	90	1.5	8	2
7.80	3	●	DSAS0780X03S080	24.9	41.5	41.5	91.5	90	1.5	8	2
7.90	3	●	DSAS0790X03S080	25.2	41.5	41.5	91.5	90	1.5	8	2
7.94	3	●	DSAS0794X03S080	25.3	41.5	41.5	91.5	90	1.5	8	2
8.00	3	●	DSAS0800X03S080	25.5	41.5	41.5	91.5	90	1.5	8	2
8.10	3	●	DSAS0810X03S100	25.8	44.5	47.5	97.5	96	1.5	10	2
8.20	3	●	DSAS0820X03S100	26.1	44.5	47.5	97.5	96	1.5	10	2
8.33	3	●	DSAS0833X03S100	26.5	44.5	47.5	97.5	96	1.5	10	2
8.40	3	●	DSAS0840X03S100	26.7	44.5	47.5	97.5	96	1.5	10	2
8.50	3	●	DSAS0850X03S100	27.0	44.5	47.5	97.5	96	1.5	10	2
8.60	3	●	DSAS0860X03S100	27.4	46.6	48.6	102.6	101	1.6	10	2
8.70	3	●	DSAS0870X03S100	27.7	46.6	48.6	102.6	101	1.6	10	2
8.73	3	●	DSAS0873X03S100	27.8	46.6	48.6	102.6	101	1.6	10	2
8.80	3	●	DSAS0880X03S100	28.0	46.6	48.6	102.6	101	1.6	10	2
8.90	3	○	DSAS0890X03S100	28.3	46.6	48.6	102.6	101	1.6	10	2
9.00	3	●	DSAS0900X03S100	28.6	46.6	48.6	102.6	101	1.6	10	2
9.50	3	●	DSAS0950X03S100	30.3	49.8	50.8	102.8	101	1.8	10	2
9.53	3	●	DSAS0953X03S100	30.4	49.8	50.8	102.8	101	1.8	10	2
9.92	3	●	DSAS0992X03S100	31.6	51.8	51.8	102.8	101	1.8	10	2
10.00	3	●	DSAS1000X03S100	31.8	51.8	51.8	102.8	101	1.8	10	2
10.32	3	●	DSAS1032X03S120	32.9	54.9	57.9	112.9	111	1.9	12	2
10.50	3	●	DSAS1050X03S120	33.4	54.9	57.9	112.9	111	1.9	12	2
10.72	3	●	DSAS1072X03S120	34.1	57.0	59.0	118.0	116	2.0	12	2
11.00	3	●	DSAS1100X03S120	35.0	57.0	59.0	118.0	116	2.0	12	2
11.50	3	●	DSAS1150X03S120	36.6	60.1	61.1	118.1	116	2.1	12	2
12.00	3	●	DSAS1200X03S120	38.2	62.2	62.2	118.2	116	2.2	12	2

● : Inventory maintained in Japan. ○ : Inventory maintained in Japan. (Scheduled to be released this winter)

External Coolant



	DC=3	3<DC≤6	6<DC≤10	10<DC≤12	
	⁰ _{-0.018}	⁰ _{-0.018}	⁰ _{-0.022}	⁰ _{-0.027}	
	DCON=6	6<DCON≤10	DCON=12		
	⁰ _{-0.018}	⁰ _{-0.009}	⁰ _{-0.011}		



*When looking at the coating the color can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC	L/D	DP9020	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	DSAE0300X03S060	9.5	21.5	23.5	70.5	70	0.5	6	1
3.4	3	●	DSAE0340X03S060	10.8	21.6	23.6	70.6	70	0.6	6	1
4.0	3	●	DSAE0400X03S060	12.7	22.7	23.7	70.7	70	0.7	6	1
4.3	3	●	DSAE0430X03S060	13.7	24.8	26.8	73.8	73	0.8	6	1
4.5	3	●	DSAE0450X03S060	14.3	24.8	26.8	73.8	73	0.8	6	1
5.0	3	●	DSAE0500X03S060	15.9	28.9	29.9	81.9	81	0.9	6	2
5.1	3	●	DSAE0510X03S060	16.2	28.9	29.9	81.9	81	0.9	6	2
5.4	3	●	DSAE0540X03S060	17.2	29.0	30.0	82.0	81	1.0	6	2
5.5	3	●	DSAE0550X03S060	17.5	29.0	30.0	82.0	81	1.0	6	2
5.6	3	●	DSAE0560X03S060	17.9	31.1	31.1	82.1	81	1.1	6	2
5.9	3	●	DSAE0590X03S060	18.8	31.1	31.1	82.1	81	1.1	6	2
6.0	3	●	DSAE0600X03S060	19.1	31.1	31.1	82.1	81	1.1	6	2
6.1	3	●	DSAE0610X03S080	19.5	34.2	37.2	87.2	86	1.2	8	2
6.2	3	●	DSAE0620X03S080	19.8	34.2	37.2	87.2	86	1.2	8	2
6.4	3	●	DSAE0640X03S080	20.4	34.2	37.2	87.2	86	1.2	8	2
6.8	3	●	DSAE0680X03S080	21.7	36.3	38.3	91.3	90	1.3	8	2
6.9	3	●	DSAE0690X03S080	22.0	36.3	38.3	91.3	90	1.3	8	2
7.0	3	●	DSAE0700X03S080	22.3	36.3	38.3	91.3	90	1.3	8	2
7.1	3	●	DSAE0710X03S080	22.7	39.4	40.4	91.4	90	1.4	8	2
7.8	3	●	DSAE0780X03S080	24.9	41.5	41.5	91.5	90	1.5	8	2
8.0	3	●	DSAE0800X03S080	25.5	41.5	41.5	91.5	90	1.5	8	2
8.1	3	●	DSAE0810X03S100	25.8	44.5	47.5	97.5	96	1.5	10	2
8.2	3	●	DSAE0820X03S100	26.1	44.5	47.5	97.5	96	1.5	10	2
8.4	3	●	DSAE0840X03S100	26.7	44.5	47.5	97.5	96	1.5	10	2
8.5	3	●	DSAE0850X03S100	27.0	44.5	47.5	97.5	96	1.5	10	2
9.0	3	●	DSAE0900X03S100	28.6	46.6	48.6	102.6	101	1.6	10	2
10.0	3	●	DSAE1000X03S100	31.8	51.8	51.8	102.8	101	1.8	10	2
10.5	3	●	DSAE1050X03S120	33.4	54.9	57.9	112.9	111	1.9	12	2
10.7	3	●	DSAE1070X03S120	34.0	56.9	57.9	112.9	111	1.9	12	2
11.0	3	●	DSAE1100X03S120	35.0	57.0	59.0	118.0	116	2.0	12	2
11.5	3	●	DSAE1150X03S120	36.6	60.1	61.1	118.1	116	2.1	12	2
12.0	3	●	DSAE1200X03S120	38.2	62.2	62.2	118.2	116	2.2	12	2

DC = Cutting Diameter
 LU = Usable Length
 LCF = Length Chip Flute

LH = Neck Length
 OAL = Overall Length
 LF = Functional Length

PL = Point Length
 DCON = Connection Diameter

Recommended Cutting Conditions

(mm)

Workpiece Material		Heat Resistant Alloys		Titanium Alloys	
		Inconel718 etc.		Ti-6Al-4V etc.	
DC	L/D	Revolution n (min ⁻¹)	Feed fr (Min. – Max.) (mm/rev.)	Revolution n (min ⁻¹)	Feed fr (Min. – Max.) (mm/rev.)
3	≤ 3	1000	0.06 (0.04–0.10)	4200	0.08 (0.06–0.12)
4	≤ 3	790	0.06 (0.04–0.10)	3100	0.10 (0.08–0.16)
5	≤ 3	760	0.08 (0.06–0.12)	2500	0.12 (0.08–0.20)
6	≤ 3	790	0.10 (0.08–0.15)	2100	0.14 (0.10–0.20)
8	≤ 3	590	0.10 (0.08–0.15)	1600	0.18 (0.15–0.25)
10	≤ 3	570	0.10 (0.08–0.15)	1300	0.22 (0.18–0.28)
12	≤ 3	530	0.12 (0.08–0.15)	1100	0.24 (0.20–0.30)

Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.

Note 2) Emulsion type of water-soluble coolant is recommended.

Note 3) In non water-insoluble coolant, reduce the cutting speed by 10%-20%.

Note 4) When drilling length of DCx1 or more with the use of external coolant system, step drilling is recommended in every DCx0.5 to encourage chips to break.



Regrinding Manual

<http://www.mitsubishicarbide.com/en/download/grind-manual>

For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or driver. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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<http://www.mitsubishicarbide.com/en/>

(Tools specifications subject to change without notice.)