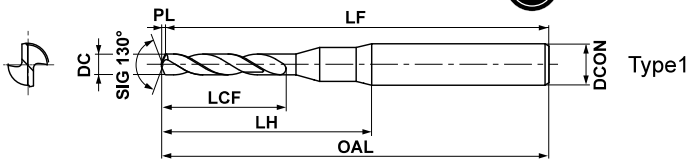
DRILLING (SOLID CARBIDE)

MSE

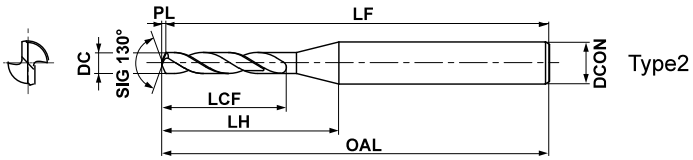
- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

P M K N S H

0,1≤DC≤0,99
0 −0.009
h6 0 −0.006



Type1



Type2

(Note) MSE drills are suitable for use with shrink fit holders.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.10	●		MSE0010SB	1.22	9.72	38.02	38	0.02	3	1
0.11	★		MSE0011SB	1.23	9.73	38.03	38	0.03	3	1
0.12	★		MSE0012SB	1.43	9.73	38.03	38	0.03	3	1
0.13	★		MSE0013SB	1.43	9.73	38.03	38	0.03	3	1
0.14	★		MSE0014SB	2.03	9.73	38.03	38	0.03	3	1
0.15	●		MSE0015SB	2.03	9.73	38.03	38	0.03	3	1
0.16	★		MSE0016SB	2.04	9.74	38.04	38	0.04	3	1
0.17	★		MSE0017SB	2.04	9.74	38.04	38	0.04	3	1
0.18	★		MSE0018SB	2.04	9.74	38.04	38	0.04	3	1
0.19	★		MSE0019SB	2.04	9.74	38.04	38	0.04	3	1
0.20	●		MSE0020SB	2.55	9.75	38.05	38	0.05	3	1
0.21	★		MSE0021SB	2.55	9.75	38.05	38	0.05	3	1
0.22	★		MSE0022SB	2.55	9.75	38.05	38	0.05	3	1
0.23	★		MSE0023SB	2.55	9.75	38.05	38	0.05	3	1
0.24	★		MSE0024SB	3.06	9.76	38.06	38	0.06	3	1
0.25	●		MSE0025SB	3.06	9.76	38.06	38	0.06	3	1
0.26	★		MSE0026SB	3.06	9.76	38.06	38	0.06	3	1
0.27	★		MSE0027SB	3.06	9.76	38.06	38	0.06	3	1
0.28	★		MSE0028SB	3.07	9.77	38.07	38	0.07	3	1
0.29	★		MSE0029SB	3.07	9.77	38.07	38	0.07	3	1
0.30		●	MSE0030SB	5.07	10.27	38.07	38	0.07	3	2
0.31		★	MSE0031SB	5.07	10.27	38.07	38	0.07	3	2
0.32		★	MSE0032SB	5.07	10.27	38.07	38	0.07	3	2
0.33		★	MSE0033SB	5.08	10.28	38.08	38	0.08	3	2
0.34		★	MSE0034SB	6.08	11.28	38.08	38	0.08	3	2
0.35		●	MSE0035SB	6.08	11.18	38.08	38	0.08	3	2
0.36		★	MSE0036SB	6.08	11.18	38.08	38	0.08	3	2
0.37		★	MSE0037SB	6.09	11.19	38.09	38	0.09	3	2
0.38		★	MSE0038SB	6.09	11.19	38.09	38	0.09	3	2
0.39		★	MSE0039SB	6.09	11.19	38.09	38	0.09	3	2
0.40		●	MSE0040SB	7.09	12.19	38.09	38	0.09	3	2
0.41		★	MSE0041SB	7.10	12.10	38.10	38	0.10	3	2
0.42		★	MSE0042SB	7.10	12.10	38.10	38	0.10	3	2
0.43		★	MSE0043SB	7.10	12.10	38.10	38	0.10	3	2

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.44		★	MSE0044SB	7.10	12.10	38.10	38	0.10	3	2
0.45		●	MSE0045SB	7.10	12.10	38.10	38	0.10	3	2
0.46		★	MSE0046SB	7.11	12.01	38.11	38	0.11	3	2
0.47		★	MSE0047SB	7.11	12.01	38.11	38	0.11	3	2
0.48		★	MSE0048SB	7.11	12.01	38.11	38	0.11	3	2
0.49		★	MSE0049SB	7.11	12.01	38.11	38	0.11	3	2
0.50		●	MSE0050SB	7.12	12.02	38.12	38	0.12	3	2
0.51		★	MSE0051SB	7.12	11.92	38.12	38	0.12	3	2
0.52		★	MSE0052SB	7.12	11.92	38.12	38	0.12	3	2
0.53		★	MSE0053SB	7.12	11.92	38.12	38	0.12	3	2
0.54		★	MSE0054SB	7.13	11.93	38.13	38	0.13	3	2
0.55		●	MSE0055SB	7.13	11.93	38.13	38	0.13	3	2
0.56		★	MSE0056SB	7.13	11.93	38.13	38	0.13	3	2
0.57		★	MSE0057SB	7.13	11.83	38.13	38	0.13	3	2
0.58		★	MSE0058SB	7.14	11.84	38.14	38	0.14	3	2
0.59		★	MSE0059SB	7.14	11.84	38.14	38	0.14	3	2
0.60		●	MSE0060SB	7.14	11.84	38.14	38	0.14	3	2
0.61		★	MSE0061SB	7.14	11.84	38.14	38	0.14	3	2
0.62		★	MSE0062SB	7.14	11.74	38.14	38	0.14	3	2
0.63		★	MSE0063SB	7.15	11.75	38.15	38	0.15	3	2
0.64		★	MSE0064SB	7.15	11.75	38.15	38	0.15	3	2
0.65		●	MSE0065SB	7.15	11.75	38.15	38	0.15	3	2
0.66		★	MSE0066SB	7.15	11.75	38.15	38	0.15	3	2
0.67		★	MSE0067SB	7.16	11.66	38.16	38	0.16	3	2
0.68		★	MSE0068SB	7.16	11.66	38.16	38	0.16	3	2
0.69		★	MSE0069SB	7.16	11.66	38.16	38	0.16	3	2
0.70		●	MSE0070SB	8.16	12.66	38.16	38	0.16	3	2
0.71		★	MSE0071SB	8.17	12.67	38.17	38	0.17	3	2
0.72		★	MSE0072SB	8.17	12.67	38.17	38	0.17	3	2
0.73		★	MSE0073SB	8.17	12.57	38.17	38	0.17	3	2
0.74		★	MSE0074SB	8.17	12.57	38.17	38	0.17	3	2
0.75		●	MSE0075SB	8.17	12.57	38.17	38	0.17	3	2
0.76		★	MSE0076SB	8.18	12.58	38.18	38	0.18	3	2
0.77		★	MSE0077SB	8.18	12.58	38.18	38	0.18	3	2

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameters and lengths can be made to order).

● : Inventory maintained. ★ : Inventory maintained in Japan.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.78		★	MSE0078SB	8.18	12.48	38.18	38	0.18	3	2
0.79		★	MSE0079SB	8.18	12.48	38.18	38	0.18	3	2
0.80		●	MSE0080SB	10.19	14.49	38.19	38	0.19	3	2
0.81		★	MSE0081SB	10.19	14.49	38.19	38	0.19	3	2
0.82		★	MSE0082SB	10.19	14.49	38.19	38	0.19	3	2
0.83		★	MSE0083SB	10.19	14.49	38.19	38	0.19	3	2
0.84		★	MSE0084SB	10.20	14.40	38.20	38	0.20	3	2
0.85		●	MSE0085SB	10.20	14.40	38.20	38	0.20	3	2
0.86		★	MSE0086SB	10.20	14.40	38.20	38	0.20	3	2
0.87		★	MSE0087SB	10.20	14.40	38.20	38	0.20	3	2
0.88		★	MSE0088SB	10.21	14.41	38.21	38	0.21	3	2

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.89		★	MSE0089SB	10.21	14.31	38.21	38	0.21	3	2
0.90		●	MSE0090SB	10.21	14.31	38.21	38	0.21	3	2
0.91		★	MSE0091SB	10.21	14.31	38.21	38	0.21	3	2
0.92		★	MSE0092SB	10.21	14.31	38.21	38	0.21	3	2
0.93		★	MSE0093SB	10.22	14.32	38.22	38	0.22	3	2
0.94		★	MSE0094SB	10.22	14.22	38.22	38	0.22	3	2
0.95		●	MSE0095SB	10.22	14.22	38.22	38	0.22	3	2
0.96		★	MSE0096SB	10.22	14.22	38.22	38	0.22	3	2
0.97		★	MSE0097SB	10.23	14.23	38.23	38	0.23	3	2
0.98		★	MSE0098SB	10.23	14.23	38.23	38	0.23	3	2
0.99		●	MSE0099SB	10.23	14.23	38.23	38	0.23	3	2

RECOMMENDED CUTTING CONDITIONS

Work Material	P: Mild Steel (≤180HB) Ck10					P: Carbon steel, Alloy steel (180—280HB) Ck45, 41CrMo4				
Drill Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001—0.003)	0.02	40	6	20000	0.002 (0.001—0.003)	0.02	40
0.12	8	20000	0.002 (0.001—0.003)	0.02	40	8	20000	0.002 (0.001—0.003)	0.02	40
0.16	10	20000	0.002 (0.001—0.003)	0.02	40	10	20000	0.002 (0.001—0.003)	0.02	40
0.2	13	20000	0.003 (0.002—0.004)	0.04	60	13	20000	0.003 (0.002—0.004)	0.04	60
0.25	16	20000	0.003 (0.002—0.004)	0.04	60	16	20000	0.003 (0.002—0.004)	0.04	60
0.32	20	20000	0.004 (0.003—0.005)	0.05	80	20	20000	0.004 (0.003—0.005)	0.05	80
0.4	25	20000	0.004 (0.003—0.005)	0.05	80	25	20000	0.004 (0.003—0.005)	0.05	80
0.5	31	20000	0.006 (0.005—0.007)	0.1	120	31	20000	0.006 (0.005—0.007)	0.1	120
0.63	40	20000	0.008 (0.006—0.01)	0.1	160	40	20000	0.008 (0.006—0.01)	0.1	160
0.8	50	20000	0.02 (0.015—0.025)	0.3	400	50	20000	0.015 (0.012—0.018)	0.3	300
0.99	62	20000	0.04 (0.03—0.05)	0.3	800	62	20000	0.02 (0.015—0.025)	0.3	400

Work Material	P: Carbon steel, Alloy steel (280—350HB) 36CrNiMo4					P: Pre-Hardened Steel (35—45HRC) X36CrMo17				
Drill Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001—0.003)	0.02	40	6	20000	0.002 (0.001—0.003)	0.02	40
0.12	8	20000	0.002 (0.001—0.003)	0.02	40	8	20000	0.002 (0.001—0.003)	0.02	40
0.16	10	20000	0.002 (0.001—0.003)	0.02	40	10	20000	0.002 (0.001—0.003)	0.02	40
0.2	13	20000	0.003 (0.002—0.004)	0.04	60	13	20000	0.003 (0.002—0.004)	0.04	60
0.25	16	20000	0.003 (0.002—0.004)	0.04	60	16	20000	0.003 (0.002—0.004)	0.04	60
0.32	20	20000	0.004 (0.003—0.005)	0.05	80	20	20000	0.004 (0.003—0.005)	0.05	80
0.4	25	20000	0.004 (0.003—0.005)	0.05	80	25	20000	0.004 (0.003—0.005)	0.05	80
0.5	31	20000	0.006 (0.005—0.007)	0.1	120	31	20000	0.006 (0.005—0.007)	0.1	120
0.63	40	20000	0.008 (0.006—0.01)	0.1	160	40	20000	0.008 (0.006—0.01)	0.1	160
0.8	50	20000	0.015 (0.012—0.018)	0.3	300	50	20000	0.015 (0.012—0.018)	0.3	300
0.99	62	20000	0.02 (0.015—0.025)	0.3	400	62	20000	0.02 (0.015—0.025)	0.3	400

(Notes)
- When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended.
- Change the cutting conditions depending on your machine and workpiece rigidity.
- When machining holes over 5DC, reduce the peck distance stated above.
- The use of water-soluble fluid (diluted 20 times) is recommended for drilling using the cutting conditions above. Lower the revolutions if oil fluid or mist is used.
- Work materials marked by "—" in the tables above are difficult to drill with external coolant.

DRILLING (SOLID CARBIDE)

MSE

- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

RECOMMENDED CUTTING CONDITIONS

Work Material	M: Austenitic Stainless Steel (≤200HB) X5CrNi1810, X5CrNiMo17-12-2					K: Gray Cast Iron (≤350MPa) GG30				
Drill Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001—0.003)	0.02	40	6	20000	0.002 (0.001—0.003)	0.02	40
0.12	8	20000	0.002 (0.001—0.003)	0.02	40	8	20000	0.002 (0.001—0.003)	0.02	40
0.16	10	20000	0.002 (0.001—0.003)	0.02	40	10	20000	0.002 (0.001—0.003)	0.02	40
0.2	11	18000	0.003 (0.002—0.004)	0.04	54	13	20000	0.003 (0.002—0.004)	0.04	60
0.25	14	18000	0.003 (0.002—0.004)	0.04	54	16	20000	0.003 (0.002—0.004)	0.04	60
0.32	15	15000	0.004 (0.003—0.005)	0.05	60	20	20000	0.004 (0.003—0.005)	0.05	80
0.4	19	15000	0.004 (0.003—0.005)	0.05	60	25	20000	0.004 (0.003—0.005)	0.05	80
0.5	16	10000	0.006 (0.005—0.007)	0.1	60	31	20000	0.006 (0.005—0.007)	0.1	120
0.63	20	10000	0.008 (0.006—0.01)	0.1	80	40	20000	0.008 (0.006—0.01)	0.1	160
0.8	15	6000	0.015 (0.012—0.018)	0.2	90	50	20000	0.02 (0.015—0.025)	0.3	400
0.99	19	6000	0.02 (0.015—0.025)	0.2	120	62	20000	0.04 (0.03—0.05)	0.3	800

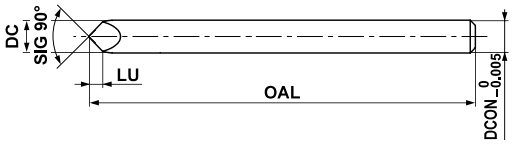
Work Material	N: Aluminium Alloy (Si<5%)					S: Heat Resistant Alloy Inconel718				
Drill Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001—0.003)	0.05	40	2	7000	0.001 (0.0005—0.001)	0.02	7
0.12	8	20000	0.003 (0.002—0.004)	0.05	60	3	7000	0.001 (0.0005—0.001)	0.02	7
0.16	10	20000	0.004 (0.003—0.005)	0.05	80	4	7000	0.001 (0.0005—0.001)	0.02	7
0.2	13	20000	0.006 (0.005—0.007)	0.1	120	3	5000	0.002 (0.001—0.002)	0.04	10
0.25	16	20000	0.008 (0.006—0.01)	0.1	160	4	5000	0.002 (0.001—0.002)	0.04	10
0.32	20	20000	0.01 (0.008—0.012)	0.3	200	4	4000	0.002 (0.001—0.002)	0.05	8
0.4	25	20000	0.02 (0.015—0.025)	0.3	400	5	4000	0.002 (0.001—0.002)	0.05	8
0.5	31	20000	0.03 (0.025—0.035)	0.5	600	5	3000	0.003 (0.001—0.003)	0.1	9
0.63	40	20000	0.04 (0.035—0.045)	0.5	800	6	3000	0.004 (0.002—0.004)	0.1	12
0.8	50	20000	0.05 (0.045—0.055)	0.8	1000	5	1800	0.006 (0.004—0.006)	0.2	10.8
0.99	62	20000	0.06 (0.055—0.065)	0.8	1200	6	1800	0.01 (0.008—0.01)	0.2	18

(Notes)

- When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended.
- Change the cutting conditions depending on your machine and workpiece rigidity.
- When machining holes over 5DC, reduce the peck distance stated above.
- The use of water-soluble fluid (diluted 20 times) is recommended for drilling using the cutting conditions above. Lower the revolutions if oil fluid or mist is used.
- Work materials marked by "—" in the tables above are difficult to drill with external coolant.

MSP
SPOT DRILL

P M K N S H



Order Number	Grade	Stock	Dimension (mm)				Diameter Range (mm)
			DC	LU	OAL	DCON	
MSP0300SB	**VP15TF**	●	3	1.5	38	3	**0.1—3.0**

RECOMMENDED CUTTING CONDITIONS

Hole Size Range (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.1—3.0	10000	0.0005 (0.00025—0.001)	5

● : Inventory maintained.