

Solid Carbide Drill for Steel and Cast Iron

WSTAR Drill Series

MQ5

Employs new TRI-cooling technology.

**High performance drill series for long-life,
high efficiency machining of steel and cast iron.**

■ Drill sizes available in 0.1mm increments from $\phi 3.0$ to $\phi 20.0$.

■ L/D 3, 5 types are available as standard.

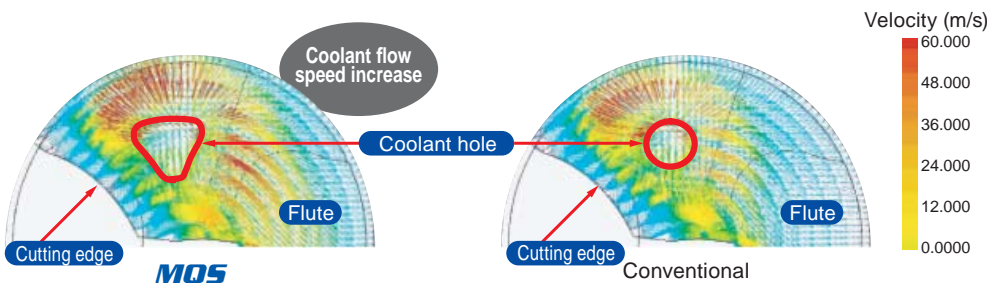


MQS

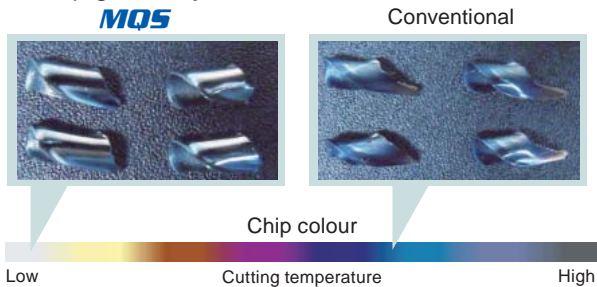
Unique coolant hole geometry

New TRI Cooling technology increases the flow of coolant, rapidly eliminating the heat generated by cutting.
(Coolant holes on drills larger than $\phi 6$ mm)

- Coolant flow speed simulation (Rotation 4700min^{-1})
More than doubles the amount of coolant discharged by conventional drills.
Outstanding cooling efficiency for longer life.



- Chip geometry



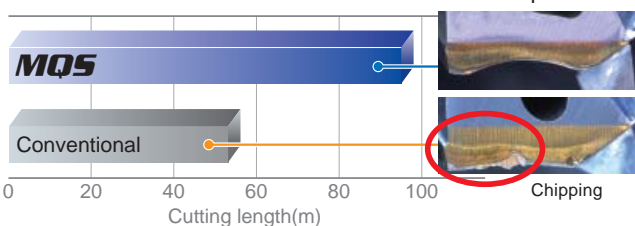
Workpiece : JIS S50C
Drill : $\phi 8\text{mm}$
Hole depth : 25mm (L/D=3)
Cutting speed : 120m/min
Feed : 0.25mm/rev
Machine : Machining centre
Coolant : M.Q.L.

New tool grade DP3020

Special multilayer PVD coating for drills using proprietary crystal control technology enables double the tool life compared with earlier products.

- Tool life

Achieves tool life more than 1.5 times that of earlier products.



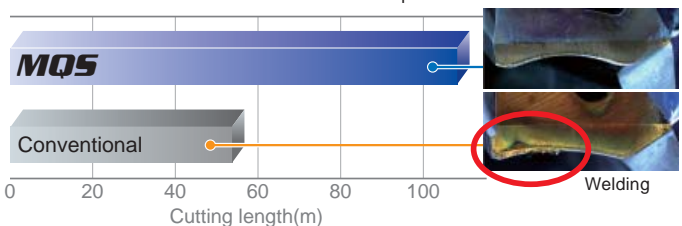
Workpiece : JIS S50C
Drill : $\phi 8\text{mm}$
Hole depth : 25mm (L/D=3)
Cutting speed : 120m/min
Feed : 0.25mm/rev
Machine : Machining centre
Coolant : W.S.O

- Feature

	Hardness (HV)	Oxidation Temperature (°C)	Wear Coefficient*
DP3020	3300	1100	0.44
Conventional	2800	840	0.58

*Coefficient of friction : Measured by ball-on-disk method.
(Counter gear : AISI D2 60HRC)

Achieves tool life more than 2 times that of earlier products in M.Q.L coolant condition.



Workpiece : JIS S50C
Drill : $\phi 8\text{mm}$
Hole depth : 25mm (L/D=3)
Cutting speed : 120m/min
Feed : 0.25mm/rev
Machine : Machining centre
Coolant : M.Q.L.

Empolys new TRI-cooling technology. High performance drill series for long-life, high efficiency machining of steel and cast iron.

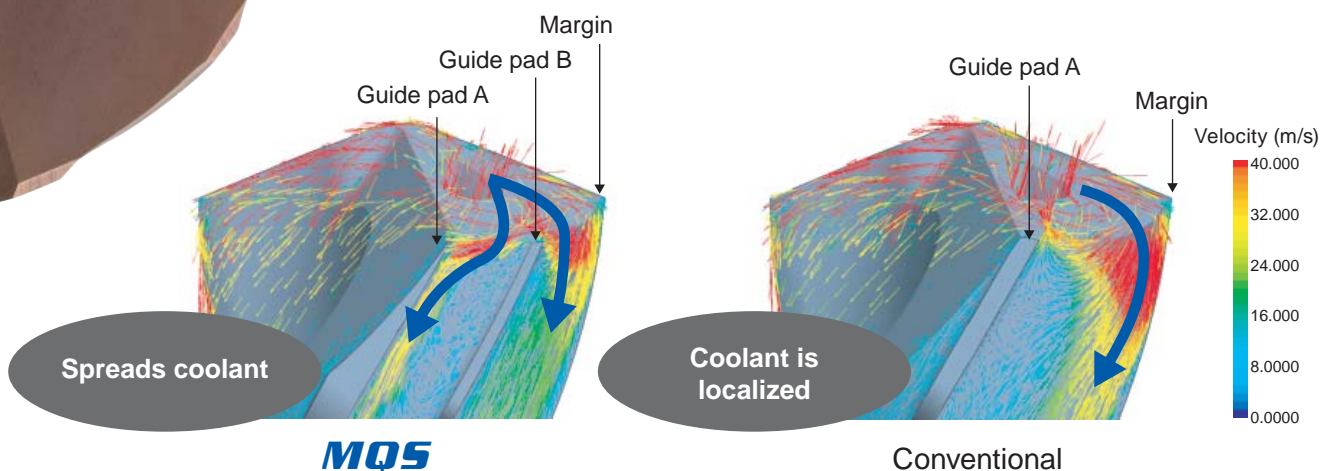
Wavy cutting edge for steel and cast iron

The wavy cutting edge, specially designed for steel and cast iron, delivers outstanding chip control and cutting edge strength.

Triple margin for steel and cast iron

The unique triple margin provides optimal control of the flow of coolant to the edges of the drill, reducing margin damage.

■ Coolant flow speed simulation (Rotation 4700min⁻¹)



	Guide pad A	Guide pad B	Margin	Oversize
MQS				<p>Small wear</p>
Conventional				<p>Large wear</p>

Workpiece : JIS S50C
 Drill : $\phi 8\text{mm}$
 Hole depth : 25mm (L/D=3)
 Cutting speed : 120m/min
 Feed : 0.25mm/rev
 Machine : Machining centre
 Coolant : W.S.O

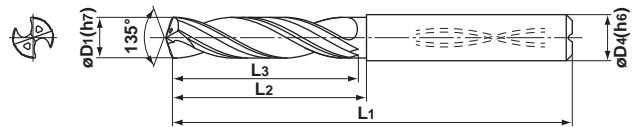
Solid Carbide Drill for Steel and Cast Iron

MQS

WSTAR DRILLS SERIES

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast iron	Light Alloy	Heat Resistant Alloy
◎			◎		

	D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤20
D1 Tolerance (mm)	0 -0.012	0 -0.012	0 -0.015	0 -0.018	0 -0.021
D4 Tolerance (mm)	0 -0.006	0 -0.008	0 -0.009	0 -0.011	0 -0.013



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
3.0	3	Int.	●	MQS0300X3DB	21	23	70	3
	5	Int.	●	0300X5DB	28	31	78	3
3.1	3	Int.	●	0310X3DB	21	23	70	4
	5	Int.	●	0310X5DB	28	31	78	4
3.2	3	Int.	●	0320X3DB	21	23	70	4
	5	Int.	●	0320X5DB	28	31	78	4
3.3	3	Int.	●	0330X3DB	21	23	70	4
	5	Int.	●	0330X5DB	28	31	78	4
3.4	3	Int.	●	0340X3DB	21	23	70	4
	5	Int.	●	0340X5DB	28	31	78	4
3.5	3	Int.	●	0350X3DB	21	23	70	4
	5	Int.	●	0350X5DB	28	31	78	4
3.6	3	Int.	●	0360X3DB	22	23	70	4
	5	Int.	●	0360X5DB	30	31	78	4
3.7	3	Int.	●	0370X3DB	22	23	70	4
	5	Int.	●	0370X5DB	30	31	78	4
3.8	3	Int.	●	0380X3DB	22	23	70	4
	5	Int.	●	0380X5DB	30	31	78	4
3.9	3	Int.	●	0390X3DB	22	23	70	4
	5	Int.	●	0390X5DB	30	31	78	4
4.0	3	Int.	●	0400X3DB	22	23	70	4
	5	Int.	●	0400X5DB	30	31	78	4
4.1	3	Int.	●	0410X3DB	24	26	73	5
	5	Int.	●	0410X5DB	33	35	82	5
4.2	3	Int.	●	0420X3DB	24	26	73	5
	5	Int.	●	0420X5DB	33	35	82	5
4.3	3	Int.	●	0430X3DB	24	26	73	5
	5	Int.	●	0430X5DB	33	35	82	5
4.4	3	Int.	●	0440X3DB	24	26	73	5
	5	Int.	●	0440X5DB	33	35	82	5
4.5	3	Int.	●	0450X3DB	24	26	73	5
	5	Int.	●	0450X5DB	33	35	82	5
4.6	3	Int.	●	0460X3DB	25	28	75	5
	5	Int.	●	0460X5DB	35	38	85	5
4.7	3	Int.	●	0470X3DB	25	28	75	5
	5	Int.	●	0470X5DB	35	38	85	5
4.8	3	Int.	●	0480X3DB	25	28	75	5
	5	Int.	●	0480X5DB	35	38	85	5

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
4.9	3	Int.	●	MQS0490X3DB	25	28	75	5
	5	Int.	●	0490X5DB	35	38	85	5
5.0	3	Int.	●	0500X3DB	25	28	75	5
	5	Int.	●	0500X5DB	35	38	85	5
5.1	3	Int.	●	0510X3DB	28	30	81	6
	5	Int.	●	0510X5DB	39	42	89	6
5.2	3	Int.	●	0520X3DB	28	30	81	6
	5	Int.	●	0520X5DB	39	42	89	6
5.3	3	Int.	●	0530X3DB	28	30	81	6
	5	Int.	●	0530X5DB	39	42	89	6
5.4	3	Int.	●	0540X3DB	28	30	81	6
	5	Int.	●	0540X5DB	39	42	89	6
5.5	3	Int.	●	0550X3DB	28	30	81	6
	5	Int.	●	0550X5DB	39	42	89	6
5.6	3	Int.	●	0560X3DB	30	30	81	6
	5	Int.	●	0560X5DB	42	42	89	6
5.7	3	Int.	●	0570X3DB	30	30	81	6
	5	Int.	●	0570X5DB	42	42	89	6
5.8	3	Int.	●	0580X3DB	30	30	81	6
	5	Int.	●	0580X5DB	42	42	89	6
5.9	3	Int.	●	0590X3DB	30	30	81	6
	5	Int.	●	0590X5DB	42	42	89	6
6.0	3	Int.	●	0600X3DB	30	30	81	6
	5	Int.	●	0600X5DB	42	42	89	6
6.1	3	Int.	●	0610X3DB	33	35	86	7
	5	Int.	●	0610X5DB	46	48	95	7
6.2	3	Int.	●	0620X3DB	33	35	86	7
	5	Int.	●	0620X5DB	46	48	95	7
6.3	3	Int.	●	0630X3DB	33	35	86	7
	5	Int.	●	0630X5DB	46	48	95	7
6.4	3	Int.	●	0640X3DB	33	35	86	7
	5	Int.	●	0640X5DB	46	48	95	7
6.5	3	Int.	●	0650X3DB	33	35	86	7
	5	Int.	●	0650X5DB	46	48	95	7
6.6	3	Int.	●	0660X3DB	35	37	90	7
	5	Int.	●	0660X5DB	49	51	98	7
6.7	3	Int.	●	0670X3DB	35	37	90	7
	5	Int.	●	0670X5DB	49	51	98	7

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order NumA	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
6.8	3	Int.	●	MQS0680X3DB	35	37	90	7
	5	Int.	●	0680X5DB	49	51	98	7
6.9	3	Int.	●	0690X3DB	35	37	90	7
	5	Int.	●	0690X5DB	49	51	98	7
7.0	3	Int.	●	0700X3DB	35	37	90	7
	5	Int.	●	0700X5DB	49	51	98	7
7.1	3	Int.	●	0710X3DB	38	39	90	8
	5	Int.	●	0710X5DB	53	56	103	8
7.2	3	Int.	●	0720X3DB	38	39	90	8
	5	Int.	●	0720X5DB	53	56	103	8
7.3	3	Int.	●	0730X3DB	38	39	90	8
	5	Int.	●	0730X5DB	53	56	103	8
7.4	3	Int.	●	0740X3DB	38	39	90	8
	5	Int.	●	0740X5DB	53	56	103	8
7.5	3	Int.	●	0750X3DB	38	39	90	8
	5	Int.	●	0750X5DB	53	56	103	8
7.6	3	Int.	●	0760X3DB	40	40	90	8
	5	Int.	●	0760X5DB	56	56	103	8
7.7	3	Int.	●	0770X3DB	40	40	90	8
	5	Int.	●	0770X5DB	56	56	103	8
7.8	3	Int.	●	0780X3DB	40	40	90	8
	5	Int.	●	0780X5DB	56	56	103	8
7.9	3	Int.	●	0790X3DB	40	40	90	8
	5	Int.	●	0790X5DB	56	56	103	8
8.0	3	Int.	●	0800X3DB	40	40	90	8
	5	Int.	●	0800X5DB	56	56	103	8
8.1	3	Int.	●	0810X3DB	43	45	96	9
	5	Int.	●	0810X5DB	60	62	113	9
8.2	3	Int.	●	0820X3DB	43	45	96	9
	5	Int.	●	0820X5DB	60	62	113	9
8.3	3	Int.	●	0830X3DB	43	45	96	9
	5	Int.	●	0830X5DB	60	62	113	9
8.4	3	Int.	●	0840X3DB	43	45	96	9
	5	Int.	●	0840X5DB	60	62	113	9
8.5	3	Int.	●	0850X3DB	43	45	96	9
	5	Int.	●	0850X5DB	60	62	113	9
8.6	3	Int.	●	0860X3DB	45	47	101	9
	5	Int.	●	0860X5DB	63	65	116	9
8.7	3	Int.	●	0870X3DB	45	47	101	9
	5	Int.	●	0870X5DB	63	65	116	9
8.8	3	Int.	●	0880X3DB	45	47	101	9
	5	Int.	●	0880X5DB	63	65	116	9
8.9	3	Int.	●	0890X3DB	45	47	101	9
	5	Int.	●	0890X5DB	63	65	116	9
9.0	3	Int.	●	0900X3DB	45	47	101	9
	5	Int.	●	0900X5DB	63	65	116	9
9.1	3	Int.	●	0910X3DB	48	50	101	10
	5	Int.	●	0910X5DB	67	70	121	10
9.2	3	Int.	●	0920X3DB	48	50	101	10
	5	Int.	●	0920X5DB	67	70	121	10

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order NumA	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
9.3	3	Int.	●	MQS0930X3DB	48	50	101	10
	5	Int.	●	0930X5DB	67	70	121	10
9.4	3	Int.	●	0940X3DB	48	50	101	10
	5	Int.	●	0940X5DB	67	70	121	10
9.5	3	Int.	●	0950X3DB	48	50	101	10
	5	Int.	●	0950X5DB	67	70	121	10
9.6	3	Int.	●	0960X3DB	50	50	101	10
	5	Int.	●	0960X5DB	70	70	121	10
9.7	3	Int.	●	0970X3DB	50	50	101	10
	5	Int.	●	0970X5DB	70	70	121	10
9.8	3	Int.	●	0980X3DB	50	50	101	10
	5	Int.	●	0980X5DB	70	70	121	10
9.9	3	Int.	●	0990X3DB	50	50	101	10
	5	Int.	●	0990X5DB	70	70	121	10
10.0	3	Int.	●	1000X3DB	50	50	101	10
	5	Int.	●	1000X5DB	70	70	121	10
10.1	3	Int.	●	1010X3DB	53	55	111	11
	5	Int.	●	1010X5DB	74	78	134	11
10.2	3	Int.	●	1020X3DB	53	55	111	11
	5	Int.	●	1020X5DB	74	78	134	11
10.3	3	Int.	●	1030X3DB	53	55	111	11
	5	Int.	●	1030X5DB	74	78	134	11
10.4	3	Int.	●	1040X3DB	53	55	111	11
	5	Int.	●	1040X5DB	74	78	134	11
10.5	3	Int.	●	1050X3DB	53	55	111	11
	5	Int.	●	1050X5DB	74	78	134	11
10.6	3	Int.	●	1060X3DB	55	56	116	11
	5	Int.	●	1060X5DB	77	78	134	11
10.7	3	Int.	●	1070X3DB	55	56	116	11
	5	Int.	●	1070X5DB	77	78	134	11
10.8	3	Int.	●	1080X3DB	55	56	116	11
	5	Int.	●	1080X5DB	77	78	134	11
10.9	3	Int.	●	1090X3DB	55	56	116	11
	5	Int.	●	1090X5DB	77	78	134	11
11.0	3	Int.	●	1100X3DB	55	56	116	11
	5	Int.	●	1100X5DB	77	78	134	11
11.1	3	Int.	●	1110X3DB	58	60	116	12
	5	Int.	●	1110X5DB	81	84	140	12
11.2	3	Int.	●	1120X3DB	58	60	116	12
	5	Int.	●	1120X5DB	81	84	140	12
11.3	3	Int.	●	1130X3DB	58	60	116	12
	5	Int.	●	1130X5DB	81	84	140	12
11.4	3	Int.	●	1140X3DB	58	60	116	12
	5	Int.	●	1140X5DB	81	84	140	12
11.5	3	Int.	●	1150X3DB	58	60	116	12
	5	Int.	●	1150X5DB	81	84	140	12
11.6	3	Int.	●	1160X3DB	60	60	116	12
	5	Int.	●	1160X5DB	84	84	140	12
11.7	3	Int.	●	1170X3DB	60	60	116	12
	5	Int.	●	1170X5DB	84	84	140	12

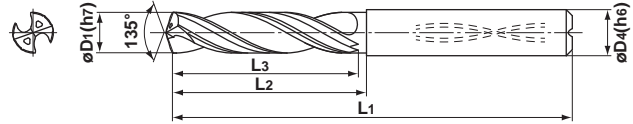


Solid Carbide Drill for Steel and Cast Iron

MQS

WSTAR DRILLS SERIES

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast iron	Light Alloy	Heat Resistant Alloy		D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤20	
◎			◎				D1 Tolerance (mm)	0 -0.012	0 -0.012	0 -0.015	0 -0.018	0 -0.021
							D4 Tolerance (mm)	0 -0.006	0 -0.008	0 -0.009	0 -0.011	0 -0.013



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
11.8	3	Int.	●	MQS1180X3DB	60	60	116	12
	5	Int.	●	1180X5DB	84	84	140	12
11.9	3	Int.	●	1190X3DB	60	60	116	12
	5	Int.	●	1190X5DB	84	84	140	12
12.0	3	Int.	●	1200X3DB	60	60	116	12
	5	Int.	●	1200X5DB	84	84	140	12
12.1	3	Int.	●	1210X3DB	63	66	122	13
	5	Int.	●	1210X5DB	88	92	148	13
12.2	3	Int.	●	1220X3DB	63	66	122	13
	5	Int.	●	1220X5DB	88	92	148	13
12.3	3	Int.	●	1230X3DB	63	66	122	13
	5	Int.	●	1230X5DB	88	92	148	13
12.4	3	Int.	●	1240X3DB	63	66	122	13
	5	Int.	●	1240X5DB	88	92	148	13
12.5	3	Int.	●	1250X3DB	63	66	122	13
	5	Int.	●	1250X5DB	88	92	148	13
12.6	3	Int.	●	1260X3DB	65	66	122	13
	5	Int.	●	1260X5DB	91	92	148	13
12.7	3	Int.	●	1270X3DB	65	66	122	13
	5	Int.	●	1270X5DB	91	92	148	13
12.8	3	Int.	●	1280X3DB	65	66	122	13
	5	Int.	●	1280X5DB	91	92	148	13
12.9	3	Int.	●	1290X3DB	65	66	122	13
	5	Int.	●	1290X5DB	91	92	148	13
13.0	3	Int.	●	1300X3DB	65	66	122	13
	5	Int.	●	1300X5DB	91	92	148	13
13.1	3	Int.	●	1310X3DB	68	70	126	14
	5	Int.	●	1310X5DB	95	98	154	14
13.2	3	Int.	●	1320X3DB	68	70	126	14
	5	Int.	●	1320X5DB	95	98	154	14
13.3	3	Int.	●	1330X3DB	68	70	126	14
	5	Int.	●	1330X5DB	95	98	154	14
13.4	3	Int.	●	1340X3DB	68	70	126	14
	5	Int.	●	1340X5DB	95	98	154	14
13.5	3	Int.	●	1350X3DB	68	70	126	14
	5	Int.	●	1350X5DB	95	98	154	14
13.6	3	Int.	●	1360X3DB	70	70	126	14
	5	Int.	●	1360X5DB	98	98	154	14

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
13.7	3	Int.	●	MQS1370X3DB	70	70	126	14
	5	Int.	●	1370X5DB	98	98	154	14
13.8	3	Int.	●	1380X3DB	70	70	126	14
	5	Int.	●	1380X5DB	98	98	154	14
13.9	3	Int.	●	1390X3DB	70	70	126	14
	5	Int.	●	1390X5DB	98	98	154	14
14.0	3	Int.	●	1400X3DB	70	70	126	14
	5	Int.	●	1400X5DB	98	98	154	14
14.1	3	Int.	●	1410X3DB	73	76	135	15
	5	Int.	●	1410X5DB	102	106	165	15
14.2	3	Int.	●	1420X3DB	73	76	135	15
	5	Int.	●	1420X5DB	102	106	165	15
14.3	3	Int.	●	1430X3DB	73	76	135	15
	5	Int.	●	1430X5DB	102	106	165	15
14.4	3	Int.	●	1440X3DB	73	76	135	15
	5	Int.	●	1440X5DB	102	106	165	15
14.5	3	Int.	●	1450X3DB	73	76	135	15
	5	Int.	●	1450X5DB	102	106	165	15
14.6	3	Int.	●	1460X3DB	75	76	135	15
	5	Int.	●	1460X5DB	105	106	165	15
14.7	3	Int.	●	1470X3DB	75	76	135	15
	5	Int.	●	1470X5DB	105	106	165	15
14.8	3	Int.	●	1480X3DB	75	76	135	15
	5	Int.	●	1480X5DB	105	106	165	15
14.9	3	Int.	●	1490X3DB	75	76	135	15
	5	Int.	●	1490X5DB	105	106	165	15
15.0	3	Int.	●	1500X3DB	75	76	135	15
	5	Int.	●	1500X5DB	105	106	165	15
15.1	3	Int.	●	1510X3DB	78	80	139	16
	5	Int.	●	1510X5DB	109	112	171	16
15.2	3	Int.	●	1520X3DB	78	80	139	16
	5	Int.	●	1520X5DB	109	112	171	16
15.3	3	Int.	●	1530X3DB	78	80	139	16
	5	Int.	●	1530X5DB	109	112	171	16
15.4	3	Int.	●	1540X3DB	78	80	139	16
	5	Int.	●	1540X5DB	109	112	171	16
15.5	3	Int.	●	1550X3DB	78	80	139	16
	5	Int.	●	1550X5DB	109	112	171	16

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained. □ : Non stock, produced to order only.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
15.6	3	Int.	●	MQS1560X3DB	80	80	139	16
	5	Int.	●	1560X5DB	112	112	171	16
15.7	3	Int.	●	1570X3DB	80	80	139	16
	5	Int.	●	1570X5DB	112	112	171	16
15.8	3	Int.	●	1580X3DB	80	80	139	16
	5	Int.	●	1580X5DB	112	112	171	16
15.9	3	Int.	●	1590X3DB	80	80	139	16
	5	Int.	●	1590X5DB	112	112	171	16
16.0	3	Int.	●	1600X3DB	80	80	139	16
	5	Int.	●	1600X5DB	112	112	171	16
16.1	3	Int.	□	1610X3DB	83	86	145	17
	5	Int.	□	1610X5DB	116	120	179	17
16.2	3	Int.	□	1620X3DB	83	86	145	17
	5	Int.	□	1620X5DB	116	120	179	17
16.3	3	Int.	□	1630X3DB	83	86	145	17
	5	Int.	□	1630X5DB	116	120	179	17
16.4	3	Int.	□	1640X3DB	83	86	145	17
	5	Int.	□	1640X5DB	116	120	179	17
16.5	3	Int.	●	1650X3DB	83	86	145	17
	5	Int.	●	1650X5DB	116	120	179	17
16.6	3	Int.	□	1660X3DB	85	86	145	17
	5	Int.	□	1660X5DB	119	120	179	17
16.7	3	Int.	□	1670X3DB	85	86	145	17
	5	Int.	□	1670X5DB	119	120	179	17
16.8	3	Int.	□	1680X3DB	85	86	145	17
	5	Int.	□	1680X5DB	119	120	179	17
16.9	3	Int.	□	1690X3DB	85	86	145	17
	5	Int.	□	1690X5DB	119	120	179	17
17.0	3	Int.	●	1700X3DB	85	86	145	17
	5	Int.	●	1700X5DB	119	120	179	17
17.1	3	Int.	□	1710X3DB	88	90	149	18
	5	Int.	□	1710X5DB	123	126	185	18
17.2	3	Int.	□	1720X3DB	88	90	149	18
	5	Int.	□	1720X5DB	123	126	185	18
17.3	3	Int.	□	1730X3DB	88	90	149	18
	5	Int.	□	1730X5DB	123	126	185	18
17.4	3	Int.	□	1740X3DB	88	90	149	18
	5	Int.	□	1740X5DB	123	126	185	18
17.5	3	Int.	●	1750X3DB	88	90	149	18
	5	Int.	●	1750X5DB	123	126	185	18
17.6	3	Int.	□	1760X3DB	90	90	149	18
	5	Int.	□	1760X5DB	126	126	185	18
17.7	3	Int.	□	1770X3DB	90	90	149	18
	5	Int.	□	1770X5DB	126	126	185	18
17.8	3	Int.	□	1780X3DB	90	90	149	18
	5	Int.	□	1780X5DB	126	126	185	18

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
17.9	3	Int.	□	MQS1790X3DB	90	90	149	18
	5	Int.	□	1790X5DB	126	126	185	18
18.0	3	Int.	●	1800X3DB	90	90	149	18
	5	Int.	●	1800X5DB	126	126	185	18
18.1	3	Int.	□	1810X3DB	93	96	157	19
	5	Int.	□	1810X5DB	130	134	195	19
18.2	3	Int.	□	1820X3DB	93	96	157	19
	5	Int.	□	1820X5DB	130	134	195	19
18.3	3	Int.	□	1830X3DB	93	96	157	19
	5	Int.	□	1830X5DB	130	134	195	19
18.4	3	Int.	□	1840X3DB	93	96	157	19
	5	Int.	□	1840X5DB	130	134	195	19
18.5	3	Int.	●	1850X3DB	93	96	157	19
	5	Int.	●	1850X5DB	130	134	195	19
18.6	3	Int.	□	1860X3DB	95	96	157	19
	5	Int.	□	1860X5DB	133	134	195	19
18.7	3	Int.	□	1870X3DB	95	96	157	19
	5	Int.	□	1870X5DB	133	134	195	19
18.8	3	Int.	□	1880X3DB	95	96	157	19
	5	Int.	□	1880X5DB	133	134	195	19
18.9	3	Int.	□	1890X3DB	95	96	157	19
	5	Int.	□	1890X5DB	133	134	195	19
19.0	3	Int.	●	1900X3DB	95	96	157	19
	5	Int.	●	1900X5DB	133	134	195	19
19.1	3	Int.	□	1910X3DB	98	100	161	20
	5	Int.	□	1910X5DB	137	140	201	20
19.2	3	Int.	□	1920X3DB	98	100	161	20
	5	Int.	□	1920X5DB	137	140	201	20
19.3	3	Int.	□	1930X3DB	98	100	161	20
	5	Int.	□	1930X5DB	137	140	201	20
19.4	3	Int.	□	1940X3DB	98	100	161	20
	5	Int.	□	1940X5DB	137	140	201	20
19.5	3	Int.	●	1950X3DB	98	100	161	20
	5	Int.	●	1950X5DB	137	140	201	20
19.6	3	Int.	□	1960X3DB	100	100	161	20
	5	Int.	□	1960X5DB	140	140	201	20
19.7	3	Int.	□	1970X3DB	100	100	161	20
	5	Int.	□	1970X5DB	140	140	201	20
19.8	3	Int.	□	1980X3DB	100	100	161	20
	5	Int.	□	1980X5DB	140	140	201	20
19.9	3	Int.	□	1990X3DB	100	100	161	20
	5	Int.	□	1990X5DB	140	140	201	20
20.0	3	Int.	●	2000X3DB	100	100	161	20
	5	Int.	●	2000X5DB	140	140	201	20

RECOMMENDED CUTTING CONDITIONS

Internal Coolant

Work Material	Drill Dia. Conditions Hardness	φ3.0—φ6.0		φ6.1—φ10.0		φ10.1—φ14.0		φ14.1—φ20.0		
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	
P Mild Steel	≤200HB	130 (60—140)	0.20 (0.15—0.25)	140 (60—160)	0.25 (0.20—0.40)	160 (60—180)	0.30 (0.20—0.40)	180 (60—220)	0.35 (0.20—0.40)	
	>200HB	100 (50—140)	0.20 (0.15—0.30)	130 (50—160)	0.25 (0.20—0.40)	140 (50—180)	0.30 (0.20—0.40)	150 (50—180)	0.35 (0.20—0.40)	
	Alloy Steel	—30HRC	100 (50—120)	0.20 (0.15—0.30)	120 (50—140)	0.25 (0.20—0.40)	130 (50—160)	0.30 (0.20—0.40)	140 (50—160)	0.35 (0.20—0.40)
30—40HRC		70 (50—100)	0.18 (0.10—0.20)	80 (50—100)	0.20 (0.10—0.30)	100 (50—120)	0.22 (0.10—0.30)	100 (50—120)	0.25 (0.20—0.35)	
K Cast Iron	—280HB	110 (50—130)	0.28 (0.15—0.35)	120 (50—160)	0.32 (0.20—0.40)	150 (60—180)	0.38 (0.25—0.45)	160 (60—180)	0.38 (0.25—0.45)	
	Ductile Cast Iron	130—180HB	90 (40—120)	0.25 (0.15—0.32)	100 (40—120)	0.30 (0.20—0.38)	110 (50—140)	0.35 (0.25—0.40)	120 (50—140)	0.35 (0.25—0.40)
		180—350HB	75 (40—120)	0.22 (0.15—0.32)	85 (40—120)	0.28 (0.20—0.38)	95 (50—140)	0.30 (0.25—0.40)	110 (50—140)	0.30 (0.25—0.40)

M.Q.L. (Coolant through)

Work Material	Drill Dia. Conditions Hardness	φ3.0—φ6.0		φ6.1—φ10.0		φ10.1—φ14.0		φ14.1—φ20.0		
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	
P Mild Steel	≤200HB	100 (60—110)	0.20 (0.15—0.25)	110 (60—130)	0.25 (0.20—0.40)	130 (60—140)	0.30 (0.20—0.40)	140 (60—180)	0.35 (0.20—0.40)	
	>200HB	80 (50—110)	0.20 (0.15—0.30)	100 (50—130)	0.25 (0.20—0.40)	110 (50—140)	0.30 (0.20—0.40)	120 (50—140)	0.35 (0.20—0.40)	
	Alloy Steel	—30HRC	80 (50—100)	0.20 (0.15—0.30)	100 (50—110)	0.25 (0.20—0.40)	100 (50—130)	0.30 (0.20—0.40)	110 (50—130)	0.35 (0.20—0.40)
30—40HRC		60 (50—80)	0.18 (0.10—0.20)	60 (50—80)	0.20 (0.10—0.30)	80 (50—100)	0.22 (0.10—0.30)	80 (50—100)	0.25 (0.20—0.35)	
K Cast Iron	—280HB	90 (50—100)	0.28 (0.15—0.35)	100 (50—130)	0.32 (0.20—0.40)	120 (60—140)	0.38 (0.25—0.45)	130 (60—140)	0.38 (0.25—0.45)	
	Ductile Cast Iron	130—180HB	70 (40—100)	0.25 (0.15—0.32)	80 (40—100)	0.30 (0.20—0.38)	90 (50—110)	0.35 (0.25—0.40)	100 (50—110)	0.35 (0.25—0.40)
		180—350HB	60 (40—100)	0.22 (0.15—0.32)	70 (40—100)	0.28 (0.20—0.38)	80 (50—110)	0.30 (0.25—0.40)	90 (50—110)	0.30 (0.25—0.40)

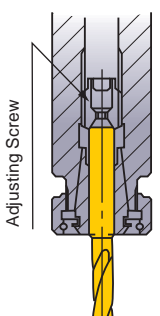
(Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.

(Note 2) Emulsion type of water coolant is recommended.

(Note 3) In non water cutting fluid, reduce the rotation.

Operation Guidance for...X3DB and...X5DB

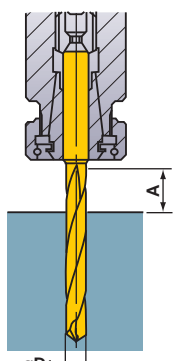
Drill Holding



Adjusting Screw

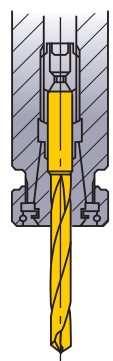
Thrust bearing type collet chuck holds the drill securely.

Drill Length



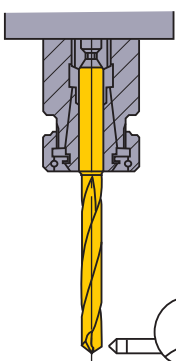
$A \geq D1 \times 1.5$

Drill Installation



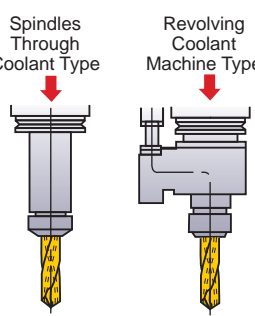
Do not clamp on the flutes.

Installation Tolerance



Run-out $\leq 0.03\text{mm}$

Through Coolant Type (MQS)



Spindles Through Coolant Type

Revolving Coolant Machine Type

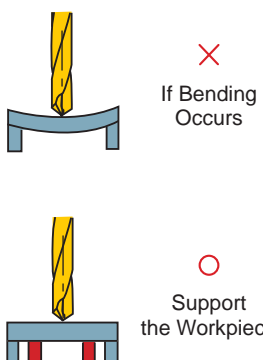
Coolant pressure is approx. 0.5MPa—7MPa

Coolant Handling

<MQS Type>

- 1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.
- 2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



If Bending Occurs

Support the Workpiece

Interrupted Cutting

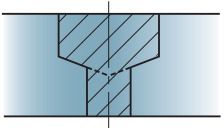
One Process

① Lower the feed when drilling the interrupted part.

Requires Prior Machining

① Spot face with an end mill prior to drilling.

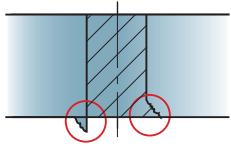
Stepped Holes



- ① Divide the two processes.
- ② Drill the larger hole first.

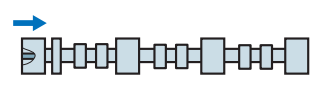
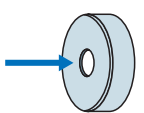
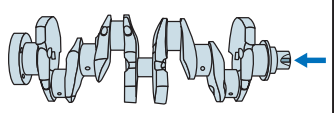
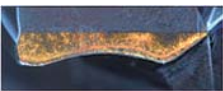

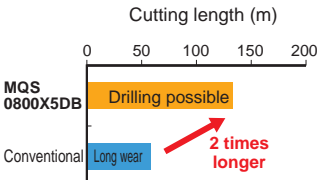
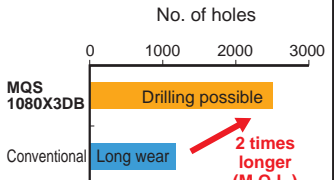
*A tool for machining both chamfer and spot face can be produced to order.

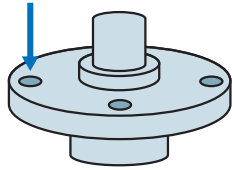
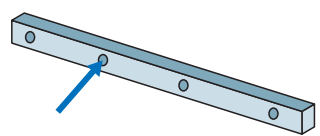
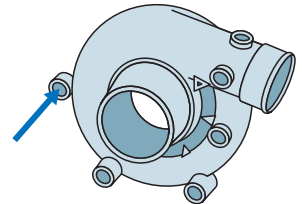
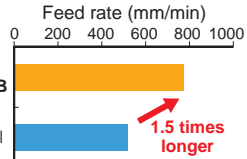
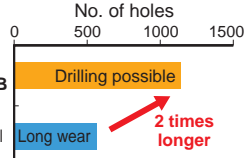
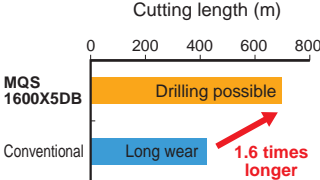
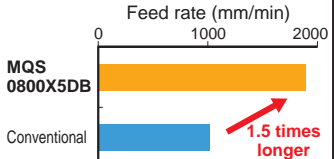
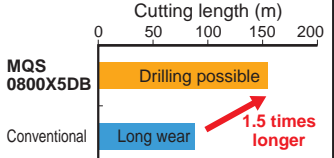
Burring and Workpiece Chipping



- ① Lower the feed rate by 50% at the end of through cutting.
- ② Add a 45° chamfer.
- ③ Change the point angle.

APPLICATION EXAMPLE

Drill		MQS0510X3DB	MQS0800X5DB	MQS1080X3DB
Workpiece		JIS SCM420 Hole depth : 15.4mm	JIS S35C Hole depth : 6mm	JIS S48C Hole depth : 50mm
				
Component		Shaft		Plate
Cutting Conditions	Drill	MQS0510X3DB	Conventional	MQS0800X5DB
	Revolution (mm ⁻¹)	4993		3501
	Cutting Speed (m/min)	80		88
	Feed (mm/rev)	0.15		0.3
	Feed Rate (mm/min)	749		1050
Coolant		W.S.O		M.Q.L.
Machine		Machining centre		Machining centre
Result		<p>●3000 Holes</p> <p>MQS 0510X3DB Drilling possible</p>  <p>Conventional Chipping</p> 	<p>Cutting length (m)</p>  <p>MQS 0800X5DB Drilling possible</p> <p>Conventional Long wear</p> <p>2 times longer</p>	<p>No. of holes</p>  <p>MQS 1080X3DB Drilling possible</p> <p>Conventional Long wear</p> <p>2 times longer (M.Q.L.)</p>

Drill		MQS1400X5DB	MQS1600X5DB	MQS0800X5DB
Workpiece		JIS S45C Hole depth : 40mm	JIS S45C Hole depth : 55mm	JIS FC200 Hole depth : 27mm
				
Component		Flange		Guide rail
Cutting Conditions	Drill	MQS1400X5DB	Conventional	MQS0800X5DB
	Revolution (mm ⁻¹)	2614	2387	6300
	Cutting Speed (m/min)	115	105	158
	Feed (mm/rev)	0.3	0.22	0.3
	Feed Rate (mm/min)	784	525	1890
Coolant		W.S.O		W.S.O
Machine		Machining centre		Machining centre
Result		<p>Feed rate (mm/min)</p>  <p>MQS 1400X5DB 1.5 times longer</p> <p>Conventional</p> <p>No. of holes</p>  <p>MQS 1400X5DB Drilling possible</p> <p>Conventional Long wear</p> <p>2 times longer</p>	<p>Cutting length (m)</p>  <p>MQS 1600X5DB Drilling possible</p> <p>Conventional Long wear</p> <p>1.6 times longer</p>	<p>Feed rate (mm/min)</p>  <p>MQS 0800X5DB 1.5 times longer</p> <p>Conventional</p> <p>Cutting length (m)</p>  <p>MQS 0800X5DB Drilling possible</p> <p>Conventional Long wear</p> <p>1.5 times longer</p>



Solid Carbide Drill for Steel and Cast Iron
WSTAR Drill Series

MQS

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 spanner. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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(Tools specifications subject to change without notice.)

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