MITSUBISHI MATERIALS

Micro-MWS

WSTAR Drill Series

SOLID CARBIDE DRILL WITH
THROUGH COOLANT HOLES





TOOL NEWS **B129A**

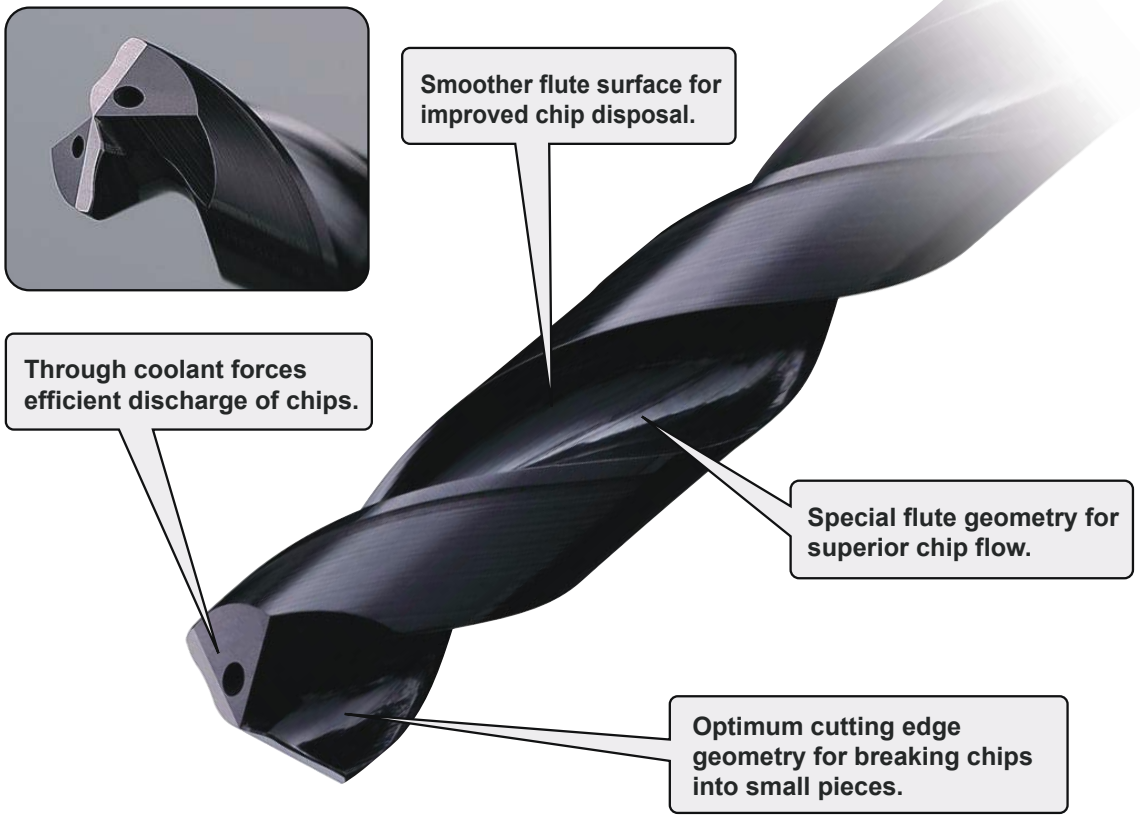
Solid Carbide Drill with Through Coolant Holes

WSTAR DRILL SERIES

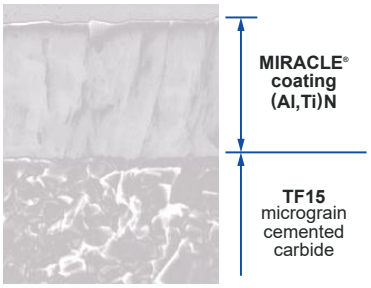
MICRO-MWS

Features of MWS-LB/XB/DB Type

- **Through coolant holes, flute geometry and cutting edge geometry are optimised for deep micro hole drilling.**



- Long tool life **MIRACLE**® coated **VP15TF**



VP15TF

MIRACLE® Coated

Features of VP15TF

MIRACLE® coated **VP15TF** is ideal for drilling due to its high resistance to chip welding. Suitable for machining a wide range of workpiece materials from mild and alloy steels through to stainless steel and cast iron.

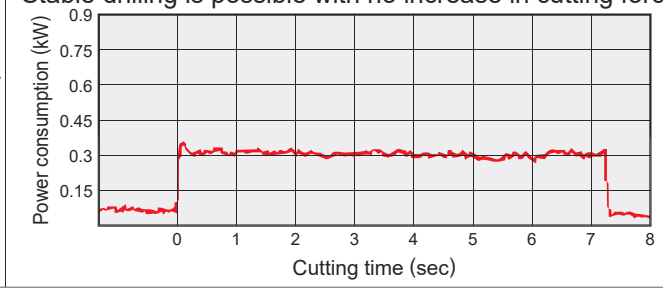
Cutting Performance

● Excellent chip disposal

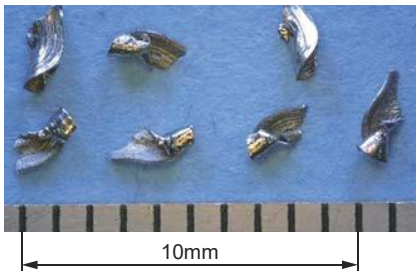
Non-peck drilling is possible when drilling 75mm depth small holes !

Cutting speed: 60m/min Feed: 0.08mm/rev

Stable drilling is possible with no increase in cutting forces



Small broken chips



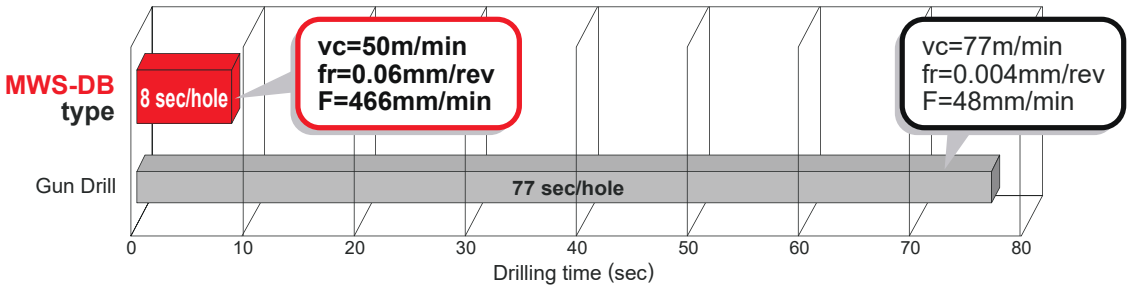
<Cutting conditions>
Workpiece : JIS SCM440
Drill : MWS0255X30DB (ϕ2.55mm)
Hole depth : 75mm
Cutting speed : 60m/min
Feed : 0.08mm/rev
Coolant : W.S.O.
Emission pressure : 5MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MWS0255SB (ϕ2.55mm)
Hole depth : 3mm
Cutting speed : 60m/min
Feed : 0.08mm/rev

● Ultra productivity machining

90% cycle time reduction when drilling 62mm depth small holes!

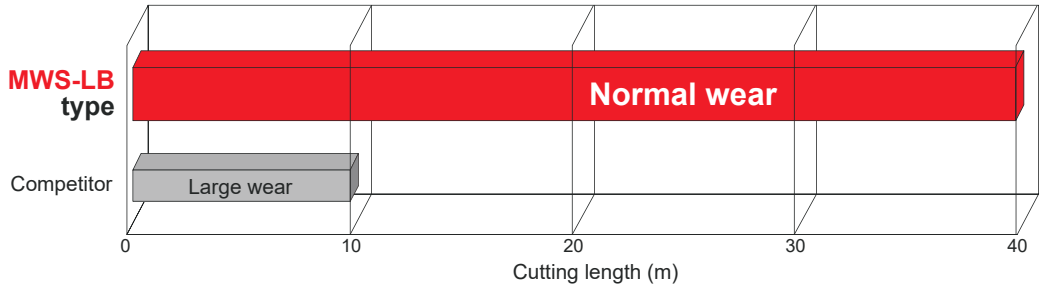
<Drilling time per hole>



<Cutting conditions for MWS-DB>
Workpiece : JIS SCM440
Drill : MWS0205X30DB (ϕ2.05mm)
Hole depth : 62mm
Cutting speed : 50m/min
Feed : 0.06mm/rev
Coolant : W.S.O.
Emission pressure : 1.5MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MWS0205SB (ϕ2.05mm)
Hole depth : 3mm
Cutting speed : 60m/min
Feed : 0.08mm/rev

● Longer tool life when drilling stainless steel

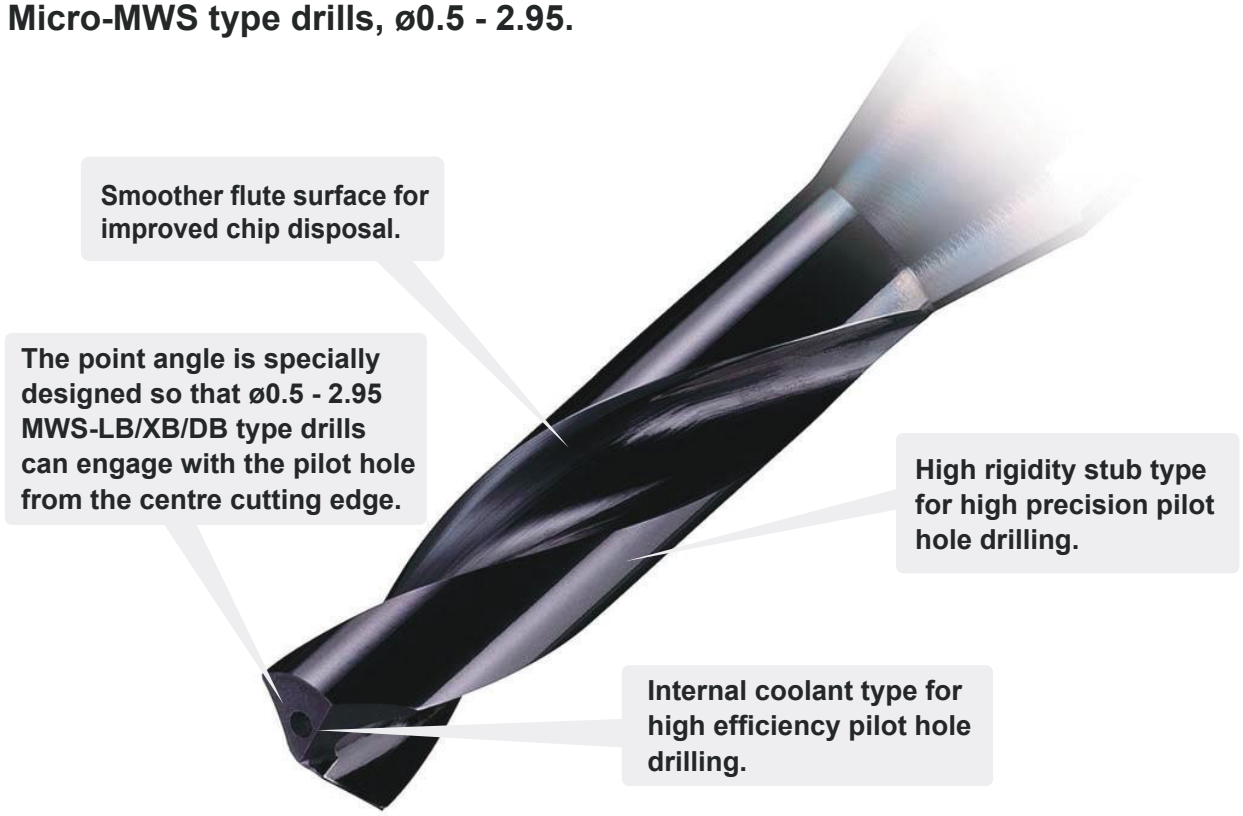


<Cutting conditions>
Workpiece : JIS SUS304
Drill : ϕ2.5mm
Hole depth : 13mm
Cutting speed : 40m/min
Feed : 0.06mm/rev
Coolant : W.S.O.
Emission pressure : 3MPa (Internal coolant)
Machine : Machining centre

MICRO-MWS
WSTAR DRILL SERIES

■ Features of MWS-SB Type

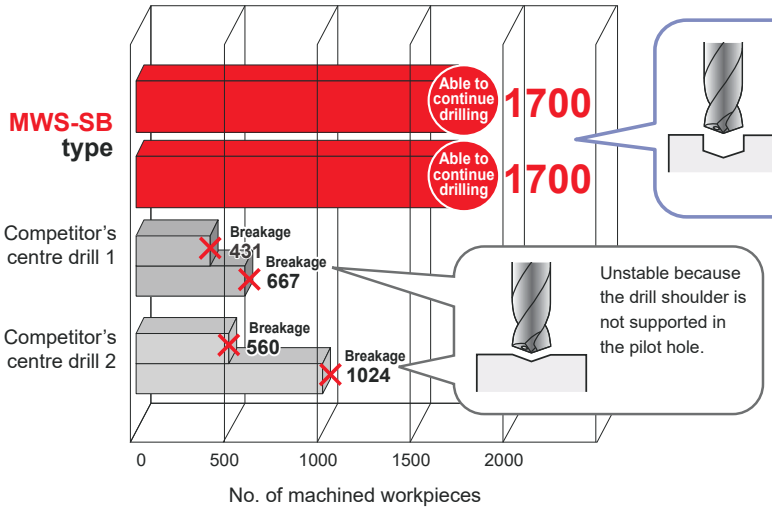
● **The MWS-SB type is a pilot drill specially designed for use with Micro-MWS type drills, ø0.5 - 2.95.**



■ Cutting Performance

● **Drilling pilot holes with the MWS-SB type allows the long Micro-MWS type drills to deliver increased tool life.**

Micro hole drilling using the MWS-SB type drill



<Cutting conditions for MWS-LB>
Workpiece : JIS SUS304
Drill : MWS0063LB (ϕ0.63mm)
Hole depth : 6mm (Blind hole)
Cutting speed: 20m/min
Feed : 0.01mm/rev
Coolant : W.S.O.
Emission pressure: 5MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MWS0063SB (ϕ0.63mm)
Hole depth : 0.8mm
Cutting speed: 20m/min
Feed : 0.08mm/rev

Memo

MICRO-MWS

● For high accuracy and efficient drilling of carbon steels through to difficult-to-cut materials.

P M K N S H

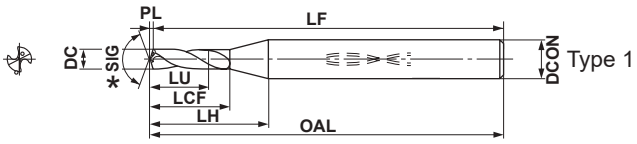
Internal Coolant

	(inch)		(mm)	
	.0197≤DC<.03	.0304≤DC<.1161	0.5≤DC<1	1≤DC<2.95
	+.00035 0	+.00055 0	+0.009 0	+0.014 0
h6	.0197≤DCON<.03	.0304≤DCON<.1161	DCON=3	
	0 −.00024	0 −.00024	0 −0.006	

SB Type



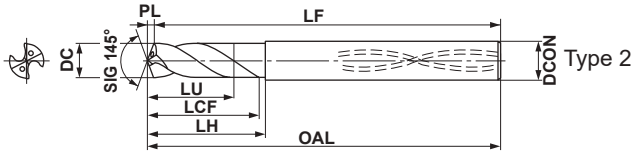
140° DC≤2 145° DC>2



Type 1



145°



Type 2

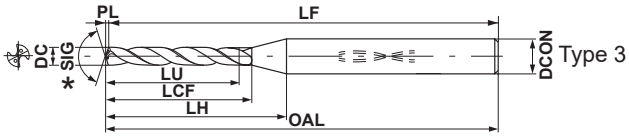
	(inch)		(mm)	
	.0197≤DC<.03	.0304≤DC<.1161	0.5≤DC<1	1≤DC<2.95
	0 −.00035	0 −.00035	0 −0.009	0 −0.014
h6	.0197≤DCON<.03	.0304≤DCON<.1161	DCON=3	
	0 −.00024	0 −.00024	0 −0.006	

LB/XB Type (ϕ.0200"–ϕ.1200" & ϕ0.50–ϕ2.95mm)



135° DC≤2 140° DC>2



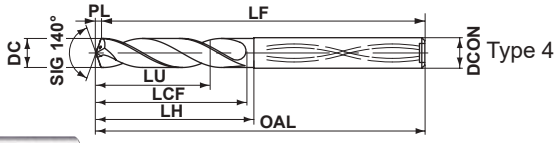


Type 3

DB Type (ϕ.0200"–ϕ.1200" & ϕ0.50–ϕ2.95mm)



140°



Type 4



* Point Angle:Type 1 140° for drill diameter ϕ0.50-2.0 and 145° for ϕ2.05-2.95.
Type 3 135° for drill diameter ϕ0.50-2.0 and 140° for ϕ2.05-2.95.

DC					L/D	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.500	.0197				1	★	MWS0050SB	0.6	.024	2.59	.102	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0050LB	2.6	.102	8.10	.319	13.10	.516	47.10	1.854	47	1.850	0.10	.004	3.0	.118	3
					12	★	MWS0050XB	6.1	.240	16.10	.634	21.10	.831	47.10	1.854	47	1.850	0.10	.004	3.0	.118	3
0.508	.0200		76		1	●	MWS00200SB	0.6	.024	2.59	.102	7.59	.299	45.09	1.775	45	1.772	0.09	.004	3.175	.125	1
					5	●	MWS00200LB	2.6	.102	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
					12	●	MWS00200XB	6.2	.244	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
0.510	.0201				1	★	MWS0051SB	0.6	.024	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0051LB	2.7	.106	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	MWS0051XB	6.2	.244	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.520	.0205				1	●	MWS0052SB	0.6	.024	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0052LB	2.7	.106	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	●	MWS0052XB	6.4	.252	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.530	**.0209**				1	★	**MWS0053SB**	0.6	.024	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0053LB**	2.8	.110	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	**MWS0053XB**	6.5	.256	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.534	**.0210**		**75**		1	●	**MWS00210SB**	0.6	.024	2.70	.106	7.60	.299	45.1	1.776	45	1.772	0.10	.004	3.175	.125	1
					5	●	**MWS00210LB**	2.8	.110	8.11	.319	13.01	.512	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
					12	●	**MWS00210XB**	6.5	.256	16.11	.634	21.01	.827	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
0.540	**.0213**				1	★	**MWS0054SB**	0.6	.024	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0054LB**	2.8	.110	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	**MWS0054XB**	6.6	.260	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.550	**.0217**				1	●	**MWS0055SB**	0.7	.028	2.70	.106	7.30	.287	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0055LB**	2.9	.114	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	●	**MWS0055XB**	6.7	.264	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.560	**.0220**				1	●	**MWS0056SB**	0.7	.028	3.00	.118	7.60	.299	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0056LB**	2.9	.114	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0056XB**	6.8	.268	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.570	**.0224**				1	●	**MWS0057SB**	0.7	.028	3.00	.118	7.50	.295	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0057LB**	3.0	.118	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0057XB**	7.0	.276	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.572	**.0225**		**74**		1	●	**MWS00225SB**	0.7	.028	3.00	.118	7.90	.311	45.10	1.776	45	1.772	0.10	.004	3.175	.125	1
					5	●	**MWS00225LB**	3.0	.118	8.12	.320	13.02	.513	47.12	1.855	47	1.850	0.12	.005	3.175	.125	3
					12	●	**MWS00225XB**	7.0	.276	16.12	.635	21.02	.828	47.12	1.855	47	1.850	0.12	.005	3.175	.125	3
0.580	**.0228**				1	★	**MWS0058SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0058LB**	3.0	.118	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	★	**MWS0058XB**	7.1	.280	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.590	**.0232**				1	★	**MWS0059SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0059LB**	3.1	.122	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	★	**MWS0059XB**	7.2	.283	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.600	**.0236**				1	●	**MWS0060SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0060LB**	3.1	.122	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0060XB**	7.3	.287	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.610	**.0240**		**73**		1	●	**MWS00240SB**	0.7	.028	3.21	.126	8.01	.315	45.11	1.776	45	1.772	0.11	.004	3.175	.125	1
					1	★	**MWS0061SB**	0.7	.028	3.21	.126	7.71	.304	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					5	●	**MWS00240LB**	3.2	.126	8.13	.320	12.93	.509	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					5	★	**MWS0061LB**	3.2	.126	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	●	**MWS00240XB**	7.4	.291	16.13	.635	20.93	.824	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					12	★	**MWS0061XB**	7.5	.295	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.620	**.0244**				1	★	**MWS0062SB**	0.7	.028	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0062LB**	3.2	.126	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0062XB**	7.6	.299	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.630	**.0248**				1	★	**MWS0063SB**	0.7	.028	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0063LB**	3.3	.130	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0063XB**	7.7	.303	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.635	**.0250**		**72**		1	●	**MWS00250SB**	0.8	.031	3.22	.127	7.92	.312	45.12	1.776	45	1.772	0.12	.005	3.175	.125	1
					5	●	**MWS00250LB**	3.3	.130	8.13	.320	12.83	.505	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					12	●	**MWS00250XB**	7.8	.307	16.13	.635	20.83	.820	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
0.640	**.0252**				1	★	**MWS0064SB**	0.8	.031	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	★	**MWS0064LB**	3.3	.130	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0064XB**	7.8	.307	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.650	.0256				1	●	MWS0065SB	0.8	.031	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	★	MWS0065LB	3.4	.134	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	●	MWS0065XB	7.9	.311	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.660	.0260		71		1	●	MWS00260SB	0.8	.031	3.52	.139	8.22	.324	45.12	1.776	45	1.772	0.12	.005	3.175	.125	1
					1	●	MWS0066SB	0.8	.031	3.52	.139	7.92	.312	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	●	MWS00260LB	3.4	.134	8.14	.320	12.84	.506	47.14	1.856	47	1.850	0.14	.006	3.175	.125	3
					5	●	MWS0066LB	3.4	.134	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	●	MWS00260XB	8.1	.319	16.14	.635	20.84	.820	47.14	1.856	47	1.850	0.14	.006	3.175	.125	3
					12	★	MWS0066XB	8.1	.319	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
0.670	.0264				1	★	MWS0067SB	0.8	.031	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	★	MWS0067LB	3.5	.138	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0067XB	8.2	.323	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
0.680	.0268				1	★	MWS0068SB	0.8	.031	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	★	MWS0068LB	3.5	.138	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0068XB	8.3	.327	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
0.690	.0272				1	★	MWS0069SB	0.8	.031	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	1
					5	★	MWS0069LB	3.6	.142	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0069XB	8.4	.331	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
0.700	.0276				1	●	MWS0070SB	0.8	.031	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	1
					5	★	MWS0070LB	3.6	.142	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0070XB	8.5	.335	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
0.710	.0280		70		1	★	MWS0071SB	0.8	.031	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
					5	★	MWS0071LB	3.7	.146	20.15	.793	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0071XB	8.7	.343	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
0.712	.0280		70		1	●	MWS00280SB	0.8	.031	3.73	.147	8.33	.328	50.13	1.974	50	1.969	0.13	.005	3.175	.125	1
					5	●	MWS00280LB	3.7	.146	10.15	.400	14.75	.581	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					12	●	MWS00280XB	8.7	.343	20.15	.793	24.75	.974	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
0.720	.0283				1	★	MWS0072SB	0.9	.035	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
					5	★	MWS0072LB	3.8	.150	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0072XB	8.8	.346	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
0.730	.0287				1	★	MWS0073SB	0.9	.035	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
					5	★	MWS0073LB	3.8	.150	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0073XB	8.9	.350	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
0.740	.0291				1	★	MWS0074SB	0.9	.035	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
					5	★	MWS0074LB	3.9	.154	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0074XB	9.0	.354	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
0.742	.0292		69		1	●	MWS00292SB	0.9	.035	3.74	.147	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
					5	●	MWS00292LB	3.9	.154	10.15	.400	14.65	.577	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					12	●	MWS00292XB	9.1	.358	20.15	.793	24.65	.970	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
0.750	.0295				1	●	MWS0075SB	0.9	.035	3.74	.147	7.94	.313	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	●	MWS0075LB	3.9	.154	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0075XB	9.2	.362	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.760	.0299				1	●	MWS0076SB	0.9	.035	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	●	MWS0076LB	4.0	.157	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0076XB	9.3	.366	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.770	.0303				1	★	MWS0077SB	0.9	.035	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	★	MWS0077LB	4.0	.157	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	★	MWS0077XB	9.4	.370	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.780	.0307				1	●	MWS0078SB	0.9	.035	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	★	MWS0078LB	4.1	.161	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0078XB	9.5	.374	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.788	.0310		68		1	●	MWS00310SB	0.9	.035	4.04	.159	8.54	.336	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
					5	●	MWS00310LB	4.1	.161	10.16	.400	14.66	.577	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
					12	●	MWS00310XB	9.6	.378	20.16	.794	24.66	.971	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
0.790	.0311				1	★	MWS0079SB	0.9	.035	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	★	MWS0079LB	4.1	.161	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	★	MWS0079XB	9.6	.378	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.794	.0313	1/32			1	●	MWS00312SB	0.9	.035	4.04	.159	8.44	.332	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
					5	●	MWS00312LB	4.1	.161	10.16	.400	14.56	.573	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
					12	●	MWS00312XB	9.7	.382	20.16	.794	24.56	.967	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
0.800	.0315				1	●	MWS0080SB	1.0	.039	4.05	.159	8.15	.321	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0080LB	4.2	.165	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	●	MWS0080XB	9.8	.386	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.810	.0319				1	★	MWS0081SB	1.0	.039	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	★	MWS0081LB	4.2	.165	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0081XB	9.9	.390	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.813	.0320		67		1	●	MWS00320SB	1.0	.039	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	1
					5	●	MWS00320LB	4.2	.165	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
					12	●	MWS00320XB	9.9	.390	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
0.820	.0323				1	●	MWS0082SB	1.0	.039	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0082LB	4.3	.169	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0.	.118	3
					12	★	MWS0082XB	10.0	.394	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.830	.0327				1	●	MWS0083SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0083LB	4.3	.169	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0083XB	10.1	.398	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.839	.0330		66		1	●	MWS00330SB	1.0	.039	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	1
					5	●	MWS00330LB	4.4	.173	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
					12	●	MWS00330XB	10.2	.402	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
0.840	.0331				1	★	MWS0084SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	★	MWS0084LB	4.4	.173	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0084XB	10.3	.406	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.850	.0335				1	●	MWS0085SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0085LB	4.4	.173	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0085XB	10.4	.409	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.860	.0339				1	●	MWS0086SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0086LB	4.5	.177	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0086XB	10.5	.413	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.870	.0343				1	★	MWS0087SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0087LB	4.5	.177	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0087XB	10.6	.417	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.880	.0346				1	★	MWS0088SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0088LB	4.6	.181	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0088XB	10.7	.421	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.889	.0350		65		1	●	MWS00350SB	1.1	.043	4.56	.180	8.86	.349	50.16	1.975	50	1.969	0.16	.006	3.175	.125	1
					5	●	MWS00350LB	4.6	.181	10.18	.401	14.48	.570	50.18	1.976	50	1.969	0.18	.007	3.175	.125	3
					12	●	MWS00350XB	10.9	.429	20.18	.794	24.48	.964	50.18	1.976	50	1.969	0.18	.007	3.175	.125	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.890	.0350		65		1	★	MWS0089SB	1.1	.043	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0089LB	4.6	.181	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0089XB	10.9	.429	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.900	.0354				1	●	MWS0090SB	1.1	.043	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	●	MWS0090LB	4.7	.185	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0090XB	11.0	.433	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.910	.0358				1	★	MWS0091SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0091LB	4.7	.185	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0091XB	11.1	.437	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.915	.0360		64		1	●	MWS00360SB	1.1	.043	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	1
					5	●	MWS00360LB	4.8	.189	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					12	●	MWS00360XB	11.1	.437	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
0.920	.0362				1	★	MWS0092SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0092LB	4.8	.189	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0092XB	11.2	.441	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.930	.0366				1	●	MWS0093SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	●	MWS0093LB	4.8	.189	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0093XB	11.4	.449	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.940	.0370		63		1	●	MWS00370SB	1.1	.043	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	1
					1	★	MWS0094SB	1.1	.043	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	●	MWS00370LB	4.9	.193	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					5	★	MWS0094LB	4.9	.193	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	●	MWS00370XB	11.5	.453	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					12	★	MWS0094XB	11.5	.453	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.950	.0374				1	★	MWS0095SB	1.1	.043	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0095LB	5.0	.197	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0095XB	11.6	.457	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.960	.0378				1	★	MWS0096SB	1.1	.043	5.07	.200	8.87	.349	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0096LB	5.0	.197	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0096XB	11.7	.461	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.966	.0380		62		1	●	MWS00380SB	1.1	.043	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	1
					5	●	MWS00380LB	5.0	.197	10.20	.402	14.30	.563	50.20	1.976	50	1.969	0.20	.008	3.175	.125	3
					12	●	MWS00380XB	11.8	.465	20.20	.795	24.30	.957	50.20	1.976	50	1.969	0.20	.008	3.175	.125	3
0.970	.0382				1	●	MWS0097SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	●	MWS0097LB	5.1	.201	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0097XB	11.8	.465	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.980	.0386				1	★	MWS0098SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	★	MWS0098LB	5.1	.201	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0098XB	12.0	.472	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.990	.0390		61		1	●	MWS0099SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	★	MWS0099LB	5.2	.205	10.21	.402	14.21	.559	50.21	1.977	50	1.969	0.21	.008	3.0	.118	3
					12	★	MWS0099XB	12.1	.476	20.21	.796	24.21	.953	50.21	1.977	50	1.969	0.21	.008	3.0	.118	3
0.991	.0390		61		1	●	MWS00390SB	1.2	.047	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	1
					5	●	MWS00390LB	5.2	.205	10.21	.402	14.31	.563	50.21	1.977	50	1.969	0.21	.008	3.175	.125	3
					12	●	MWS00390XB	12.1	.476	20.21	.796	24.31	.957	50.21	1.977	50	1.969	0.21	.008	3.175	.125	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

▲ : Micro-MWS inch & metric sizes 1.0mm - 2.95mm being phased out through 2022.
See new generation Micro-MVS drills for applicable replacement.

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.000	**.0394**				1	▲	**MWS0100SB**	1.2	.047	5.20	.205	8.9	.350	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	▲	**MWS0100LB**	5.2	.205	11.20	.441	15.2	.598	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					12	▲	**MWS0100XB**	12.2	.480	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					20	▲	**MWS0100X20DB**	20.2	.795	24.20	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	▲	**MWS0100X25DB**	25.2	.992	28.20	1.110	32.2	1.268	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	▲	**MWS0100X30DB**	30.2	1.189	33.20	1.307	37.2	1.465	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.001	**.0394**				1	▲	**MWS00394SB**	1.2	.047	5.20	.205	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00394XB**	12.2	.480	23.20	.913	27.3	1.075	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.016	**.0400**		**60**		1	▲	**MWS00400SB**	1.2	.047	5.20	.205	9.2	.362	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00400XB**	12.4	.488	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.042	**.0410**		**59**		1	▲	**MWS00410SB**	1.2	.047	5.40	.213	9.4	.370	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00410XB**	12.7	.500	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.050	**.0413**				1	▲	**MWS0105SB**	1.3	.051	5.4	.213	9.0	.354	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	▲	**MWS0105X20DB**	21.2	.835	24.2	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	▲	**MWS0105X25DB**	26.5	1.043	29.2	1.150	33.2	1.307	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	▲	**MWS0105X30DB**	31.7	1.248	35.2	1.386	38.2	1.504	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.067	**.0420**		**58**		1	▲	**MWS00420SB**	1.3	.051	5.4	.213	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00420XB**	13.0	.512	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.093	**.0430**		**57**		1	▲	**MWS00430SB**	1.3	.051	5.6	.220	9.5	.374	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00430XB**	13.3	.524	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.100	**.0433**				1	▲	**MWS0110SB**	1.3	.051	5.6	.220	9.1	.358	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	▲	**MWS0110LB**	5.7	.224	17.2	.677	21.2	.835	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					12	▲	**MWS0110XB**	13.4	.528	23.2	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					20	▲	**MWS0110X20DB**	22.2	.874	25.2	.992	29.2	1.150	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	▲	**MWS0110X25DB**	27.7	1.091	31.2	1.228	34.2	1.346	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	▲	**MWS0110X30DB**	33.2	1.307	36.2	1.425	40.2	1.583	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.150	**.0453**				1	▲	**MWS0115SB**	1.4	.055	5.8	.228	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	▲	**MWS0115X20DB**	23.2	.913	26.2	1.031	30.2	1.189	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	▲	**MWS0115X25DB**	29.0	1.142	32.2	1.268	36.2	1.425	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	▲	**MWS0115X30DB**	34.7	1.366	38.2	1.504	41.2	1.622	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.182	**.0465**		**56**		1	▲	**MWS00465SB**	1.4	.055	6.2	.244	9.9	.390	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	**MWS00465XB**	14.4	.567	23.2	.913	26.9	1.059	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.200	**.0472**				1	▲	**MWS0120SB**	1.4	.055	6.2	.244	9.6	.378	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	▲	**MWS0120LB**	6.3	.248	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	▲	**MWS0120XB**	14.7	.579	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	▲	**MWS0120X20DB**	24.3	.957	28.2	1.110	31.2	1.228	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	▲	**MWS0120X25DB**	30.3	1.193	34.2	1.346	37.2	1.465	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	▲	**MWS0120X30DB**	36.3	1.429	40.2	1.583	43.2	1.701	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.250	**.0492**				1	▲	**MWS0125SB**	1.5	.059	6.4	.252	9.7	.382	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	▲	**MWS0125X20DB**	25.3	.996	29.2	1.150	32.2	1.268	68.2	2.685	68	2.677	0.2	.008	3.0	.118	3
					25	▲	**MWS0125X25DB**	31.6	1.244	35.2	1.386	38.2	1.504	74.2	2.921	74	2.913	0.2	.008	3.0	.118	3
					30	▲	**MWS0125X30DB**	37.8	1.488	41.2	1.622	45.2	1.780	82.2	3.236	82	3.228	0.2	.008	3.0	.118	3
1.300	**.0512**				1	▲	**MWS0130SB**	1.5	.059	6.6	.260	9.8	.386	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	▲	**MWS0130LB**	6.8	.268	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	▲	**MWS0130XB**	15.9	.626	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	▲	**MWS0130X20DB**	26.3	1.035	30.2	1.189	33.2	1.307	68.2	2.685	68	2.677	0.2	.008	3.0	.118	3
					25	▲	**MWS0130X25DB**	32.8	1.291	36.2	1.425	40.2	1.583	74.2	2.921	74	2.913	0.2	.008	3.0	.118	3
					30	▲	**MWS0130X30DB**	39.3	1.547	43.2	1.701	46.2	1.819	82.2	3.236	82	3.228	0.2	.008	3.0	.118	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.321	.0520		55		1	▲	MWS00520SB	1.6	.063	6.6	.260	10.1	.398	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	▲	MWS00520XB	16.1	.634	23.3	.917	26.8	1.055	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.350	.0531				1	▲	MWS0135SB	1.7	.067	6.9	.272	10.0	.394	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					20	▲	MWS0135X20DB	27.3	1.075	31.3	1.232	34.3	1.350	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	▲	MWS0135X25DB	34.1	1.343	38.3	1.508	41.3	1.626	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	▲	MWS0135X30DB	40.8	1.606	45.3	1.783	48.3	1.902	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.397	.0550		54		1	▲	MWS00550SB	1.7	.067	7.3	.287	10.6	.417	55.3	2.177	55	2.165	0.3	.012	3.175	.125	1
					12	▲	MWS00550XB	17.1	.673	23.3	.917	26.6	1.047	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.400	.0551				1	▲	MWS0140SB	1.7	.067	7.3	.287	10.3	.406	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					5	▲	MWS0140LB	7.3	.287	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	▲	MWS0140XB	17.1	.673	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	▲	MWS0140X20DB	28.3	1.114	32.3	1.272	35.3	1.390	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	▲	MWS0140X25DB	35.3	1.390	39.3	1.547	42.3	1.665	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	▲	MWS0140X30DB	42.3	1.665	46.3	1.823	49.3	1.941	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.450	.0571				1	▲	MWS0145SB	1.8	.071	7.5	.295	10.4	.409	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					20	▲	MWS0145X20DB	29.3	1.154	33.3	1.311	36.3	1.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	▲	MWS0145X25DB	36.6	1.441	41.3	1.626	43.3	1.705	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	▲	MWS0145X30DB	43.8	1.724	48.3	1.902	51.3	2.020	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.500	.0591			#1-64	1	▲	MWS0150SB	1.8	.071	7.7	.303	10.5	.413	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					5	▲	MWS0150LB	7.8	.307	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	▲	MWS0150XB	18.3	.720	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	▲	MWS0150X20DB	30.3	1.193	35.3	1.390	37.3	1.469	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	▲	MWS0150X25DB	37.8	1.488	42.3	1.665	45.3	1.783	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	▲	MWS0150X30DB	45.3	1.783	50.3	1.980	52.3	2.059	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.502	.0591			#1-64	1	▲	MWS00591SB	1.8	.071	7.7	.303	10.8	.425	55.3	2.177	55	2.165	0.3	.012	3.175	.125	1
					12	▲	MWS00591XB	18.3	.720	23.3	.917	26.4	1.039	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.550	.0610				1	▲	MWS0155SB	1.9	.075	7.9	.311	10.6	.417	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	▲	MWS0155X20DB	31.3	1.232	36.3	1.429	38.3	1.508	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	▲	MWS0155X25DB	39.1	1.539	43.3	1.705	46.3	1.823	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	▲	MWS0155X30DB	46.8	1.843	51.3	2.020	54.3	2.138	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.588	.0625	1/16			1	▲	MWS00625SB	1.9	.075	8.3	.327	11.3	.445	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	▲	MWS00625XB	19.4	.764	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.175	.125	3
1.600	.0630				1	▲	MWS0160SB	1.9	.075	8.3	.327	10.9	.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	▲	MWS0160LB	8.3	.327	22.3	.878	25.3	.996	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					12	▲	MWS0160XB	19.5	.768	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					20	▲	MWS0160X20DB	32.3	1.272	37.3	1.469	39.3	1.547	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	▲	MWS0160X25DB	40.3	1.587	45.3	1.783	47.3	1.862	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	▲	MWS0160X30DB	48.3	1.902	53.3	2.098	55.3	2.177	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.613	.0635		52		1	▲	MWS00635SB	1.9	.075	8.3	.327	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	▲	MWS00635XB	19.7	.776	30.3	1.193	33.2	1.307	68.3	2.689	68	2.677	0.3	.012	3.175	.125	3
1.650	.0650				1	▲	MWS0165SB	2.0	.079	8.5	.335	11.0	.433	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	▲	MWS0165X20DB	33.3	1.311	38.3	1.508	40.3	1.587	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	▲	MWS0165X25DB	41.6	1.638	46.3	1.823	49.3	1.941	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	▲	MWS0165X30DB	49.8	1.961	54.3	2.138	57.3	2.256	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

▲ : Micro-MWS inch & metric sizes 1.0mm - 2.95mm being phased out through 2022.
See new generation Micro-MVS drills for applicable replacement.

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.700	.0669				1	▲	MWS0170SB	2.0	.079	8.7	.343	11.1	.437	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	▲	MWS0170LB	8.9	.350	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	▲	MWS0170XB	20.8	.819	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	▲	MWS0170X20DB	34.4	1.354	39.3	1.547	42.3	1.665	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	▲	MWS0170X25DB	42.9	1.689	48.3	1.902	50.3	1.980	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	▲	MWS0170X30DB	51.4	2.024	56.3	2.217	59.3	2.335	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.702	.0670		51		1	▲	MWS00670SB	2.0	.079	8.7	.343	11.4	.449	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	▲	MWS00670XB	20.8	.819	30.4	1.197	33.1	1.303	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.750	.0689				1	▲	MWS0175SB	2.1	.083	8.9	.350	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	▲	MWS0175X20DB	35.4	1.394	40.3	1.587	43.3	1.705	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	▲	MWS0175X25DB	44.2	1.740	49.3	1.941	51.3	2.020	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	▲	MWS0175X30DB	52.9	2.083	58.3	2.295	60.3	2.374	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.778	.0700		50	#2-56	1	▲	MWS00700SB	2.1	.083	9.3	.366	11.9	.469	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	▲	MWS00700XB	21.7	.854	30.4	1.197	33.0	1.299	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.800	.0709				1	▲	MWS0180SB	2.1	.083	9.3	.366	11.5	.453	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	▲	MWS0180LB	9.4	.370	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	▲	MWS0180XB	22.0	.866	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	▲	MWS0180X20DB	36.4	1.433	41.3	1.626	44.3	1.744	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	▲	MWS0180X25DB	45.4	1.787	50.3	1.980	53.3	2.098	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	▲	MWS0180X30DB	54.4	2.142	59.3	2.335	62.3	2.453	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.850	.0728				1	▲	MWS0185SB	2.2	.087	9.5	.374	11.6	.457	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	▲	MWS0185X20DB	37.4	1.472	43.3	1.705	45.3	1.783	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	▲	MWS0185X25DB	46.7	1.839	52.3	2.059	54.3	2.138	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	▲	MWS0185X30DB	55.9	2.201	61.3	2.413	63.3	2.492	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.855	.0730		49		1	▲	MWS00730SB	2.2	.087	9.5	.374	12.0	.472	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	▲	MWS00730XB	22.6	.890	30.4	1.197	32.9	1.295	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.900	.0748				1	▲	MWS0190SB	2.3	.091	9.8	.386	11.9	.469	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					5	▲	MWS0190LB	9.9	.390	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	▲	MWS0190XB	23.2	.913	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	▲	MWS0190X20DB	38.4	1.512	44.4	1.748	46.4	1.827	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	▲	MWS0190X25DB	47.9	1.886	53.4	2.102	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	▲	MWS0190X30DB	57.4	2.260	63.4	2.496	65.4	2.575	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3
1.931	.0760		48		1	▲	MWS00760SB	2.3	.091	10.0	.394	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.175	.125	1
					12	▲	MWS00760XB	23.6	.929	30.4	1.197	32.7	1.287	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.950	.0768				1	▲	MWS0195SB	2.4	.094	10.0	.394	12.0	.472	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					20	▲	MWS0195X20DB	39.4	1.551	45.4	1.787	47.4	1.866	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	▲	MWS0195X25DB	49.2	1.937	55.4	2.181	57.4	2.260	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	▲	MWS0195X30DB	58.9	2.319	64.4	2.535	66.4	2.614	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3
1.994	.0785				1	▲	MWS00785SB	2.4	.094	10.4	.409	12.6	.496	68.4	2.693	68	2.677	0.4	.016	3.175	.125	1
					12	▲	MWS00785XB	24.3	.957	30.4	1.197	32.6	1.283	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
2.000	.0787			#3-48	1	▲	MWS0200SB	2.4	.094	10.4	.409	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					5	▲	MWS0200LB	10.4	.409	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	▲	MWS0200XB	24.4	.961	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	▲	MWS0200X20DB	40.4	1.591	46.4	1.827	48.4	1.906	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	▲	MWS0200X25DB	50.4	1.984	56.4	2.220	58.4	2.299	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	▲	MWS0200X30DB	60.4	2.378	66.4	2.614	68.4	2.693	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions												Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.050	.0807				1	▲	MWS0205SB	2.4	.094	10.5	.413	12.3	.484	74.3	2.925	74	2.913	0.3	.012	3.0	.118	1
					20	▲	MWS0205X20DB	41.4	1.630	47.4	1.866	49.4	1.945	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0205X25DB	51.7	2.035	57.4	2.260	59.4	2.339	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0205X30DB	61.9	2.437	68.4	2.693	69.4	2.732	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.058	.0810		46		1	▲	MWS00810SB	2.4	.094	10.5	.413	12.6	.496	74.3	2.925	74	2.913	0.3	.012	3.175	.125	1
					12	▲	MWS00810XB	25.1	.988	38.4	1.512	40.5	1.594	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.100	.0827				1	▲	MWS0210SB	2.4	.094	10.7	.421	12.4	.488	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	▲	MWS0210LB	10.9	.429	28.4	1.118	30.4	1.197	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	▲	MWS0210XB	25.6	1.008	38.4	1.512	40.4	1.591	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	▲	MWS0210X20DB	42.4	1.669	48.4	1.906	50.4	1.984	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0210X25DB	52.9	2.083	59.4	2.339	60.4	2.378	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0210X30DB	63.4	2.496	69.4	2.732	71.4	2.811	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.150	.0846				1	▲	MWS0215SB	2.5	.098	10.9	.429	12.5	.492	74.3	2.925	74	2.913	0.3	.012	3.0	.118	1
					20	▲	MWS0215X20DB	43.4	1.709	49.4	1.945	51.4	2.024	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0215X25DB	54.2	2.134	60.4	2.378	62.4	2.457	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0215X30DB	64.9	2.555	71.4	2.811	73.4	2.890	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.185	.0860		44		1	▲	MWS00860SB	2.5	.098	11.3	.445	13.1	.516	74.3	2.925	74	2.913	0.3	.012	3.175	.125	1
					12	▲	MWS00860XB	26.6	1.047	38.4	1.512	40.2	1.583	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.200	.0866				1	▲	MWS0220SB	2.6	.102	11.4	.449	12.9	.508	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	▲	MWS0220LB	11.4	.449	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	▲	MWS0220XB	26.8	1.055	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	▲	MWS0220X20DB	44.4	1.748	51.4	2.024	52.4	2.063	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0220X25DB	55.4	2.181	62.4	2.457	63.4	2.496	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0220X30DB	66.4	2.614	73.4	2.890	74.4	2.929	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.250	.0886				1	▲	MWS0225SB	2.7	.106	11.6	.457	13.0	.512	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	▲	MWS0225X20DB	45.4	1.787	52.4	2.063	53.4	2.102	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0225X25DB	56.7	2.232	63.4	2.496	64.4	2.535	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0225X30DB	67.9	2.673	74.4	2.929	76.4	3.008	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.261	.0890		43	#4-40	1	▲	MWS00890SB	2.6	.102	11.6	.457	13.3	.524	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	▲	MWS00890XB	27.5	1.083	38.4	1.512	40.1	1.579	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.300	.0906				1	▲	MWS0230SB	2.7	.106	11.8	.465	13.1	.516	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	▲	MWS0230LB	11.9	.469	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	▲	MWS0230XB	28.0	1.102	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	▲	MWS0230X20DB	46.4	1.827	53.4	2.102	54.4	2.142	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0230X25DB	57.9	2.280	64.4	2.535	66.4	2.614	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0230X30DB	69.4	2.732	76.4	3.008	77.4	3.047	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.350	.0925				1	▲	MWS0235SB	2.8	.110	12.0	.472	13.2	.520	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	▲	MWS0235X20DB	47.4	1.866	54.4	2.142	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0235X25DB	59.2	2.331	66.4	2.614	67.4	2.654	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0235X30DB	70.9	2.791	78.4	3.087	79.4	3.126	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.382	.0938	3/32			1	▲	MWS00938SB	2.8	.110	12.4	.488	13.9	.547	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	▲	MWS00938XB	29.0	1.142	38.4	1.512	39.9	1.571	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3

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DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.400	.0945				1	▲	MWS0240SB	2.8	.110	12.4	.488	13.5	.531	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	▲	MWS0240LB	12.4	.488	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	▲	MWS0240XB	29.2	1.150	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	▲	MWS0240X20DB	48.4	1.906	55.4	2.181	56.4	2.220	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	▲	MWS0240X25DB	60.4	2.378	67.4	2.654	68.4	2.693	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	▲	MWS0240X30DB	72.4	2.850	79.4	3.126	80.4	3.165	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.439	.0960		41		1	▲	MWS00960SB	2.8	.110	12.6	.496	14.0	.551	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	▲	MWS00960XB	29.7	1.169	38.4	1.512	39.8	1.567	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.450	.0965				1	▲	MWS0245SB	2.9	.114	12.6	.496	13.6	.535	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	▲	MWS0245X20DB	49.5	1.949	56.5	2.224	57.5	2.264	94.5	3.720	94	3.701	0.5	.020	3.0	.118	3
					25	▲	MWS0245X25DB	61.8	2.433	69.5	2.736	70.5	2.776	107.5	4.232	107	4.213	0.5	.020	3.0	.118	3
					30	▲	MWS0245X30DB	74.0	2.913	81.5	3.209	82.5	3.248	118.5	4.665	118	4.646	0.5	.020	3.0	.118	3
2.500	.0984				1	▲	MWS0250SB	2.9	.114	12.8	.504	13.7	.539	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	▲	MWS0250LB	13.0	.512	28.5	1.122	29.5	1.161	74.5	2.933	74	2.913	0.5	.020	3.0	.118	3
					12	▲	MWS0250XB	30.5	1.201	38.5	1.516	39.5	1.555	74.5	2.933	74	2.913	0.5	.020	3.0	.118	3
					20	▲	MWS0250X20DB	50.5	1.988	58.5	2.303	59.5	2.343	94.5	3.720	94	3.701	0.5	.020	3.0	.118	3
					25	▲	MWS0250X25DB	63.0	2.480	70.5	2.776	71.5	2.815	107.5	4.232	107	4.213	0.5	.020	3.0	.118	3
					30	▲	MWS0250X30DB	75.5	2.972	83.5	3.287	84.5	3.327	118.5	4.665	118	4.646	0.5	.020	3.0	.118	3
2.550	.1004				1	▲	MWS0255SB	3.1	.122	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	▲	MWS0255X20DB	51.5	2.028	59.5	2.343	59.5	2.343	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	MWS0255X25DB	64.3	2.531	71.5	2.815	71.5	2.815	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	MWS0255X30DB	77.0	3.031	84.5	3.327	84.5	3.327	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.566	.1010				1	▲	MWS01010SB	3.0	.118	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	▲	MWS01010XB	31.3	1.232	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.600	.1024				1	▲	MWS0260SB	3.1	.122	13.4	.528	13.4	.528	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	▲	MWS0260LB	13.5	.531	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	▲	MWS0260XB	31.7	1.248	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	▲	MWS0260X20DB	52.5	2.067	60.5	2.382	60.5	2.382	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	MWS0260X25DB	65.5	2.579	73.5	2.894	73.5	2.894	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	MWS0260X30DB	78.5	3.091	86.5	3.406	86.5	3.406	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.642	.1040		37	#5-44	1	▲	MWS01040SB	3.1	.122	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	▲	MWS01040XB	32.2	1.268	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.650	.1043				1	▲	MWS0265SB	3.2	.126	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	▲	MWS0265X20DB	53.5	2.106	61.5	2.421	61.5	2.421	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	MWS0265X25DB	66.8	2.630	74.5	2.933	74.5	2.933	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	MWS0265X30DB	80.0	3.150	87.5	3.445	87.5	3.445	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.693	.1060				1	▲	MWS01060SB	3.1	.122	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	▲	MWS01060XB	32.8	1.291	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.700	.1063		36	#6-32	1	▲	MWS0270SB	3.2	.126	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	▲	MWS0270LB	14.0	.551	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	▲	MWS0270XB	32.9	1.295	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	▲	MWS0270X20DB	54.5	2.146	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	MWS0270X25DB	68.0	2.677	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	MWS0270X30DB	81.5	3.209	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.750	.1083				1	▲	MWS0275SB	3.3	.130	14.0	.551	14.0	.551	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	▲	MWS0275X20DB	55.5	2.185	63.5	2.500	63.5	2.500	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	MWS0275X25DB	69.3	2.728	77.5	3.051	77.5	3.051	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	MWS0275X30DB	83.0	3.268	91.5	3.602	91.5	3.602	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.779	**.1094**	**7/64**			1	▲	**MWS01094SB**	3.2	.126	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	▲	**MWS01094XB**	33.9	1.335	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.800	**.1102**		**35**		1	▲	**MWS0280SB**	3.3	.130	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	▲	**MWS0280LB**	14.5	.571	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	▲	**MWS0280XB**	34.1	1.343	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	▲	**MWS0280X20DB**	56.5	2.224	64.5	2.539	64.5	2.539	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	**MWS0280X25DB**	70.5	2.776	78.5	3.091	78.5	3.091	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	**MWS0280X30DB**	84.5	3.327	92.5	3.642	92.5	3.642	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.850	**.1122**				1	▲	**MWS0285SB**	3.4	.134	14.7	.579	14.7	.579	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					20	▲	**MWS0285X20DB**	57.5	2.264	66.5	2.618	66.5	2.618	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	**MWS0285X25DB**	71.8	2.827	80.5	3.169	80.5	3.169	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	**MWS0285X30DB**	86.0	3.386	94.5	3.720	94.5	3.720	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.900	**.1142**				1	▲	**MWS0290SB**	3.4	.134	14.9	.587	14.9	.587	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					5	▲	**MWS0290LB**	15.0	.591	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	▲	**MWS0290XB**	35.3	1.390	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	▲	**MWS0290X20DB**	58.5	2.303	67.5	2.657	67.5	2.657	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	**MWS0290X25DB**	73.0	2.874	81.5	3.209	81.5	3.209	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	**MWS0290X30DB**	87.5	3.445	96.5	3.799	96.5	3.799	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.950	**.1161**		**32**		1	▲	**MWS0295SB**	3.5	.138	15.1	.594	15.1	.594	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					20	▲	**MWS0295X20DB**	59.5	2.343	68.5	2.697	68.5	2.697	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	▲	**MWS0295X25DB**	74.3	2.925	83.5	3.287	83.5	3.287	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	▲	**MWS0295X30DB**	89.0	3.504	97.5	3.839	97.5	3.839	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

▲ : Micro-MWS inch & metric sizes 1.0mm - 2.95mm being phased out through 2022.
See new generation Micro-MVS drills for applicable replacement.

RECOMMENDED CUTTING CONDITIONS

■ MWS SB/LB/XB/DB Type (L/D<10)

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0004 (.0002—.0006)	130 (100—150)	.0004 (.0002—.0006)
.0248	**0.63**	130 (100—150)	.0006 (.0003—.0008)	130 (100—150)	.0006 (.0003—.0008)
.0315	**0.80**	150 (115—165)	.0011 (.0006—.0016)	150 (115—165)	.0011 (.0006—.0016)
.0394	**1.00**	165 (130—180)	.0014 (.0008—.0020)	165 (130—180)	.0014 (.0008—.0020)
.0472	**1.20**	165 (130—180)	.0018 (.0012—.0024)	165 (130—180)	.0018 (.0012—.0024)
.0630	**1.60**	165 (130—180)	.0022 (.0014—.0031)	165 (130—180)	.0022 (.0014—.0031)
.0787	**2.00**	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	**2.50**	195 (150—230)	.0033 (.0020—.0049)	195 (150—215)	.0033 (.0020—.0049)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	100 (65—115)	.0004 (.0002—.0006)	65 (50—80)	.0003 (.0002—.0004)
.0248	**0.63**	100 (65—115)	.0006 (.0003—.0008)	65 (50—80)	.0004 (.0003—.0005)
.0315	**0.80**	115 (80—130)	.0011 (.0006—.0016)	80 (65—100)	.0008 (.0006—.0010)
.0394	**1.00**	130 (100—150)	.0014 (.0008—.0020)	100 (65—115)	.0012 (.0008—.0017)
.0472	**1.20**	130 (100—150)	.0018 (.0012—.0024)	100 (65—115)	.0016 (.0012—.0021)
.0630	**1.60**	130 (100—150)	.0022 (.0014—.0031)	100 (65—115)	.0020 (.0014—.0028)
.0787	**2.00**	130 (100—150)	.0028 (.0016—.0039)	100 (65—115)	.0024 (.0016—.0031)
.0984	**2.50**	165 (130—180)	.0033 (.0020—.0049)	130 (100—150)	.0030 (.0020—.0039)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MWS

RECOMMENDED CUTTING CONDITIONS

■ MWS SB/LB/XB/DB Type (L/D<10)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0004 (.0002—.0006)	100 (65—115)	.0004 (.0002—.0006)
.0248	**0.63**	130 (100—150)	.0006 (.0003—.0008)	100 (65—115)	.0006 (.0003—.0008)
.0315	**0.80**	150 (115—165)	.0011 (.0006—.0016)	115 (80—130)	.0011 (.0006—.0016)
.0394	**1.00**	165 (130—180)	.0014 (.0008—.0020)	130 (100—150)	.0014 (.0008—.0020)
.0472	**1.20**	165 (130—180)	.0018 (.0012—.0024)	130 (100—150)	.0018 (.0012—.0024)
.0630	**1.60**	165 (130—180)	.0022 (.0014—.0031)	130 (100—150)	.0022 (.0014—.0031)
.0787	**2.00**	165 (130—180)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
.0984	**2.50**	195 (150—215)	.0033 (.0020—.0049)	165 (130—180)	.0033 (.0020—.0049)

Work Material		Aluminum Alloy (Si<5%) ASTM A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0006 (.0003—.0008)	35 (15—50)	.0002 (.0002—.0003)
.0248	**0.63**	130 (100—150)	.0008 (.0005—.0012)	35 (15—50)	.0003 (.0003—.0004)
.0315	**0.80**	150 (115—165)	.0014 (.0009—.0020)	35 (15—50)	.0006 (.0005—.0008)
.0394	**1.00**	195 (150—215)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	**1.20**	230 (180—245)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	**1.60**	260 (195—280)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	**2.00**	295 (230—310)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	**2.50**	330 (260—360)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

■ MWS DB Type (L/D≥10)

Work Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	165 (130—180)	.0008 (.0004—.0012)	130 (100—130)	.0008 (.0004—.0012)
.0472	**1.2**	165 (130—180)	.0010 (.0006—.0015)	130 (100—130)	.0010 (.0006—.0015)
.0630	**1.6**	165 (130—180)	.0022 (.0013—.0031)	130 (100—130)	.0022 (.0013—.0031)
.0787	**2.0**	195 (150—215)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	**2.5**	195 (150—215)	.0035 (.0025—.0049)	165 (130—180)	.0035 (.0022—.0049)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	100 (65—100)	.0006 (.0004—.0011)	100 (65—115)	.0006 (.0004—.0011)
.0472	**1.2**	100 (65—100)	.0008 (.0005—.0014)	100 (65—115)	.0008 (.0005—.0014)
.0630	**1.6**	100 (65—100)	.0020 (.0011—.0030)	100 (65—115)	.0020 (.0011—.0030)
.0787	**2.0**	165 (130—180)	.0026 (.0013—.0037)	100 (65—115)	.0026 (.0013—.0037)
.0984	**2.5**	165 (130—180)	.0031 (.0018—.0047)	130 (100—150)	.0031 (.0018—.0047)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	130 (100—130)	.0008 (.0004—.0012)	100 (65—100)	.0006 (.0004—.0011)
.0472	**1.2**	130 (100—130)	.0010 (.0006—.0015)	100 (65—100)	.0008 (.0005—.0014)
.0630	**1.6**	130 (100—130)	.0022 (.0013—.0031)	100 (65—100)	.0020 (.0011—.0030)
.0787	**2.0**	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0026 (.0013—.0037)
.0984	**2.5**	165 (130—180)	.0035 (.0022—.0049)	165 (130—180)	.0031 (.0018—.0047)

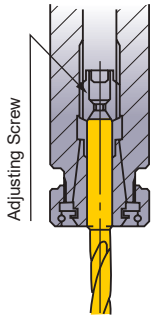
Work Material		Aluminum Alloy (Si<5%) AISI A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	165 (130—180)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	**1.2**	195 (150—215)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	**1.6**	230 (180—245)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	**2.0**	260 (195—280)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	**2.5**	295 (230—310)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MWS

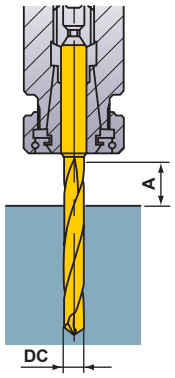
■ OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILLS (Φ.0200"-Φ.1200" & Φ0.50mm-Φ2.95mm)

Drill Holding



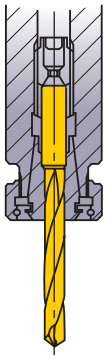
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

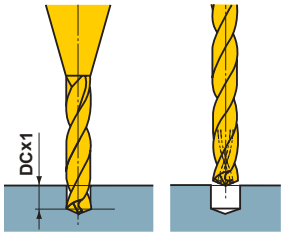
Drill Installation



NG

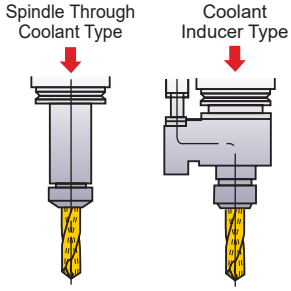
Do not clamp on the flutes.

Drill Installation



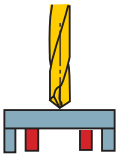
①A pilot hole must proceed application of XB or DB drill.
②Use SB drill for pilot hole.
③Depending on cutting conditions peck feeding may be necessary.

Through Coolant Type



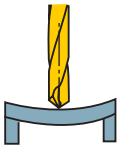
Recommended coolant pressure:
≥ 435 PSI (3MPa)
At least 220 PSI (1.5MPa) is required.

Thin Work Material



Support the Work Material

OK



If Bending Occurs

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Coolant Handling

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.

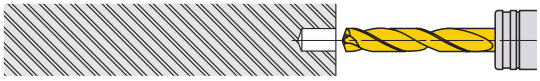
■ CAUTIONS FOR USE

- Please use a fine mesh filter (mesh≤5 micron) for coolant to prevent jamming in the oil hole.
- For deep drilling with the long type drill, machining a pilot hole is recommended.
  (Otherwise, centrifugal forces may cause drill breakage.)

■OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILL (Φ.0200"-Φ.1200" & Φ0.50mm-Φ2.95mm) (L/D≥10)

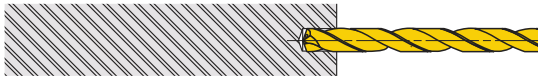
Flat Face Drilling ●Drilling a blind hole

■ 1. Drilling a Pilot Hole



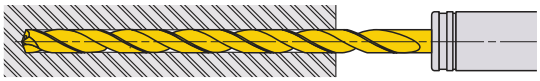
①Use the SB type drill.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC.
④Ensure a high precision hole is drilled for the guide pilot.

■ 2. Initial Cutting with the Long Type Drill



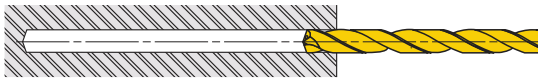
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

■ 3. Drill the Deep Hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

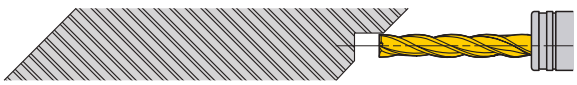
■ 4. Drill Retraction



①After drilling, lower the cutting revolution about .020-.039 inch short of the hole end. (Revolution speed of around 500-1000 min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

Irregular Face Drilling ●Drilling and breaking through on irregular faces or angles

■ 1. Spot Facing



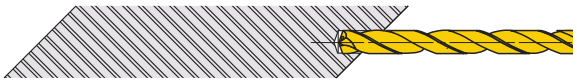
①Machine a flat on the irregular face by using an MFE (flat bottom drill) or an end mill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

■ 2. Drilling a Pilot Hole



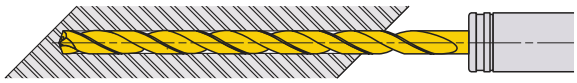
①Use a drill with the same or larger point angle than XB or DB type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC.

■ 3. Initial Cutting with the Long Type Drill



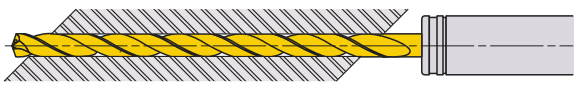
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

■ 4. Drill the Deep Hole



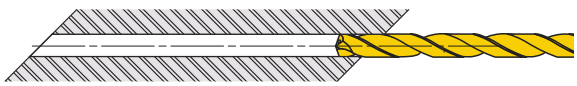
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

■ 5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Feed rate should be half the normal feed.

■ 6. Drill Retraction



①Finally clear the hole at a revolution speed of 500-1000 min^{-1}.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 IPM.

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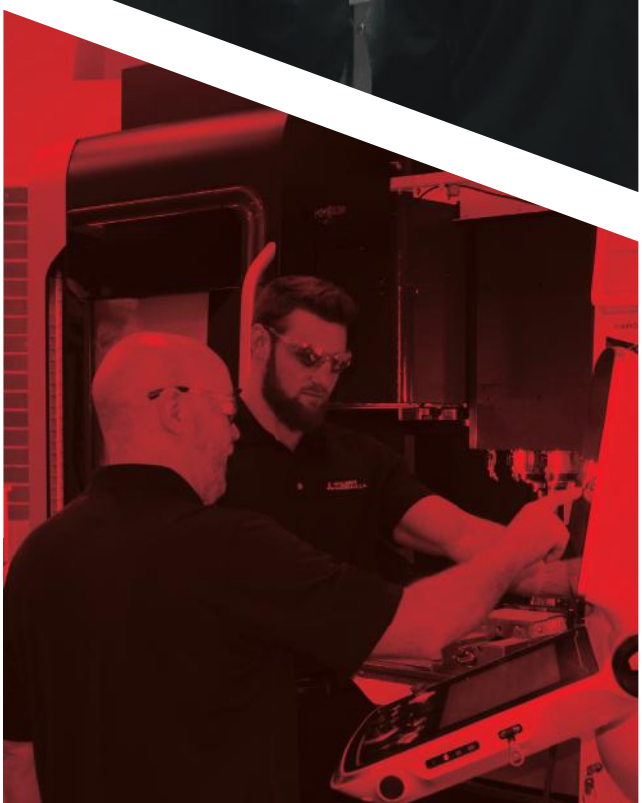
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FOR YOUR SAFETY

- 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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Tools specifications subject to change without notice.

B129A-US-2023.6