MITSUBISHI MATERIALS

MMS
WSTAR Drill Series

SOLID CARBIDE DRILL FOR
STAINLESS STEEL





TOOL NEWS **B180A**

Solid Carbide Drill for Stainless Steel

WSTAR DRILL SERIES

MMS

■ Feature

Unique coolant hole geometry for high productivity & long tool life!

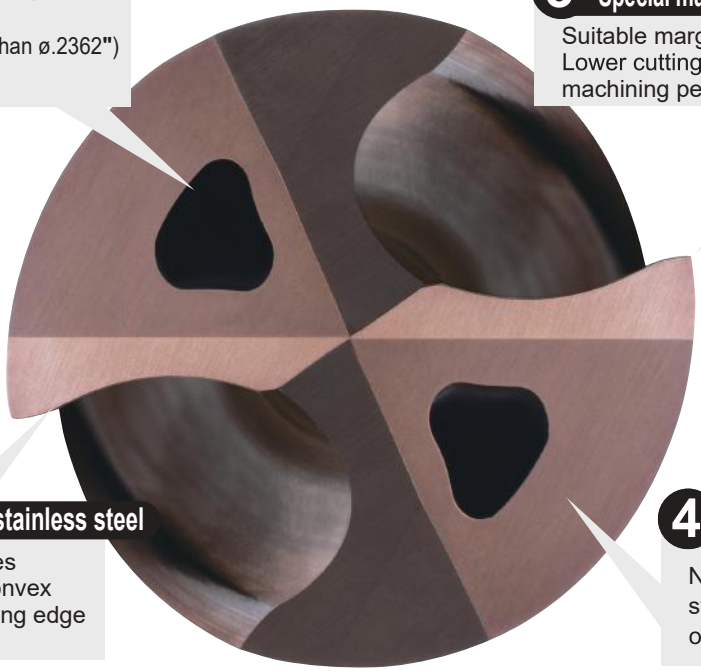
1 Unique coolant hole geometry

Employs new **TRI-cooling** technology. Coolant volume increased by unique hole shape.
(Coolant holes on drills larger than ø.2362")

PAT.P.

3 Special margin to reduce cutting resistance

Suitable margin width for stainless steels. Lower cutting resistance offering higher machining performance.



2 Wavy cutting edge for stainless steel

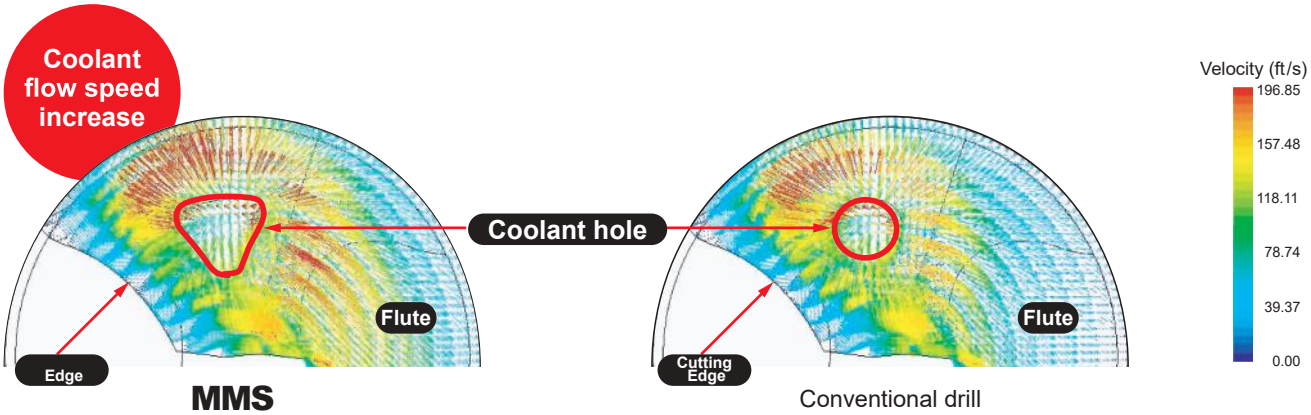
The concave edge improves sharpness, whereas the convex edge improves overall cutting edge strength.

4 New tool grade DP7020

New substrate for stainless steels, with a PVD coating offering improved lubricity.

Compared to conventional drills, coolant volume is doubled. Improved cooling and longer tool life.

● Coolant flow speed simulation (Rotation 4700 rpm)



MMS

Conventional drill

Cutting Performance

The MMS drill generates chips that are easily evacuated leading to higher performance.

MMS

Feed (inch/rev) \ VC(SFM)	195	260	330
.0079"	○ Workable	○ Workable	○ Workable
.0118"	○ Workable	○ Workable	○ Workable
.0138"	○ Workable	Breakage	—

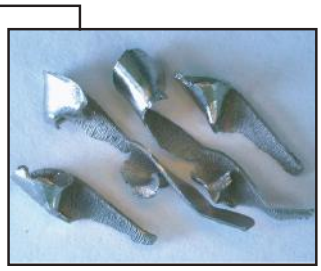


Easy to evacuate chip geometry

<Cutting conditions>
Drill : ø.2402 inch
Work piece : 304
Hole depth : 1.1811 inch (L/D=5)
Coolant : W.S.O
Emission pressure : 435 PSI
Machine : Machining Center

Conventional drill

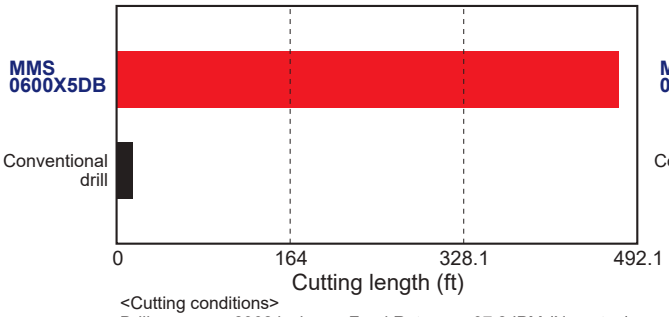
Feed (inch/rev) \ VC(SFM)	195	260	330
.0079"	○ Workable	○ Workable	○ Workable
.0118"	○ Workable	Breakage	—
.0138"	Breakage	—	—



*Above is an example, for recommended cutting conditions please refer to page 7.

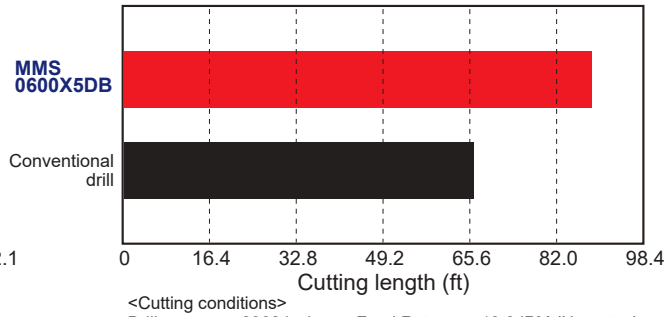
The MMS drill offer longer tool life, and can be used for various stainless steels.

●Austenitic stainless steel



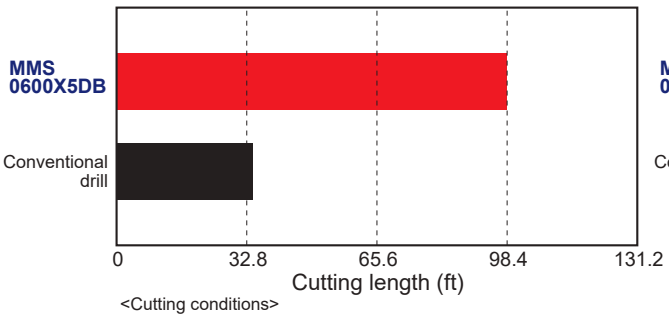
<Cutting conditions>
Drill : ø.2362 inch
Work piece : AISI 316L
Hole depth : 1.1811 inch (L/D=5)
Cutting speed : 295 SFM
Feed : .0078 inch/rev
Feed Rate : 37.2 IPM (Non-step)
Coolant : W.S.O
Emission pressure : 435 PSI
Machine : Machining Center

●Martensitic stainless steel



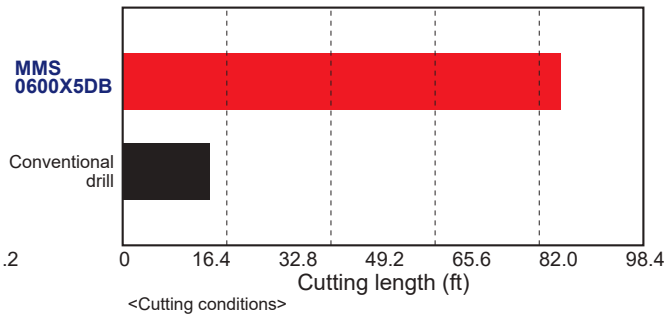
<Cutting conditions>
Drill : ø.2362 inch
Work piece : AISI 420
Hole depth : 1.1811 inch (L/D=5)
Cutting speed : 165 SFM
Feed : .0051 inch/rev
Feed Rate : 13.6 IPM (Non-step)
Coolant : W.S.O
Emission pressure : 435 PSI
Machine : Machining Center

●Duplex steel



<Cutting conditions>
Drill : ø.2362 inch
Work piece : AISI 329
Hole depth : 1.1811 inch (L/D=5)
Cutting speed : 165 SFM
Feed : .0051 inch/rev
Feed Rate : 13.6 IPM (Non-step)
Coolant : W.S.O
Emission pressure : 435 PSI
Machine : Machining Center

●PH stainless steel



<Cutting conditions>
Drill : ø.1969 inch
Work piece : AISI 630(17-4PH)
Hole depth : .9843 inch (L/D=5)
Cutting speed : 165 SFM
Feed : .0031 inch/rev
Feed Rate : 10 IPM (Non-step)
Coolant : W.S.O
Emission pressure : 435 PSI
Machine : Machining Center

Solid Carbide Drill for Stainless Steel

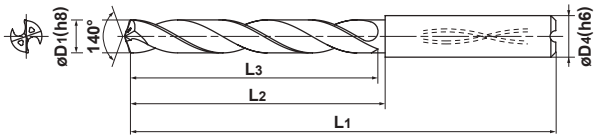
MMS

- New grade DP7020 and a unique margin, developed specifically for stainless steel, complement high flow coolant holes.
- Long drill life and high efficiency drilling in stainless steel.

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

	D_1=3	3<D_1≤6	6<D_1≤10	10<D_1≤18	18<D_1≤20
D_1 Tolerance (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D_4 Tolerance (mm)	0 −0.008	0 −0.008	0 −0.009	0 −0.011	0 −0.013





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

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
3.0	.1181				3	Int.	●	MMS0300X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0300X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.048	.1200		31		3	Int.	●	0305X3D060	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0305X5D060	28	1.102	31	1.220	78	3.071	6	.2362
3.1	.1220				3	Int.	●	0310X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0310X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.175	.1250	1/8			3	Int.	●	0318X3D060	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0318X5D060	28	1.102	31	1.220	78	3.071	6	.2362
3.2	.1260				3	Int.	●	0320X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0320X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.3	.1299			M4x0.7	3	Int.	●	0330X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0330X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.4	.1339				3	Int.	●	0340X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0340X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.5	.1378				3	Int.	●	0350X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0350X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.572	.1406	9/64			3	Int.	●	0357X3D060	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0357X5D060	30	1.181	31	1.220	78	3.071	6	.2362
3.6	.1417				3	Int.	●	0360X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0360X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.7	.1457			M4.5x0.75	3	Int.	●	0370X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0370X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.8	.1496		25	#10-24	3	Int.	●	0380X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0380X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.9	.1535				3	Int.	●	0390X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0390X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.969	.1562	5/32			3	Int.	●	0397X3D060	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0397X5D060	30	1.181	31	1.220	78	3.071	6	.2362
4.0	.1575				3	Int.	●	0400X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0400X5DB	30	1.181	31	1.220	78	3.071	6	.2362
4.039	.1590		21	#10-32	3	Int.	●	0404X3D060	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0404X5D060	33	1.299	35	1.378	82	3.228	6	.2362
4.1	.1614				3	Int.	●	0410X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0410X5DB	33	1.299	35	1.378	82	3.228	6	.2362
4.2	.1654			M5x0.8	3	Int.	●	0420X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0420X5DB	33	1.299	35	1.378	82	3.228	6	.2362
4.3	.1693				3	Int.	●	0430X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0430X5DB	33	1.299	35	1.378	82	3.228	6	.2362

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

● : **Inventory maintained.**

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
4.366	**.1719**	**11/64**			3	Int.	●	**MMS0437X3D060**	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	**0437X5D060**	33	1.299	35	1.378	82	3.228	6	.2362
4.4	**.1732**				3	Int.	●	**0440X3DB**	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	**0440X5DB**	33	1.299	35	1.378	82	3.228	6	.2362
4.5	**.1772**		**16**	**#12-24**	3	Int.	●	**0450X3DB**	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	**0450X5DB**	33	1.299	35	1.378	82	3.228	6	.2362
4.6	**.1811**				3	Int.	●	**0460X3DB**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0460X5DB**	35	1.378	38	1.496	85	3.346	6	.2362
4.7	**.1850**		**13**		3	Int.	●	**0470X3DB**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0470X5DB**	35	1.378	38	1.496	85	3.346	6	.2362
4.763	**.1875**	**3/16**			3	Int.	●	**0476X3D060**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0476X5D060**	35	1.378	38	1.496	85	3.346	6	.2362
4.8	**.1890**				3	Int.	●	**0480X3DB**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0480X5DB**	35	1.378	38	1.496	85	3.346	6	.2362
4.9	**.1929**				3	Int.	●	**0490X3DB**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0490X5DB**	35	1.378	38	1.496	85	3.346	6	.2362
5.0	**.1969**			**M6x1.0**	3	Int.	●	**0500X3DB**	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	**0500X5DB**	35	1.378	38	1.496	85	3.346	6	.2362
5.1	**.2008**		**7**	**1/4-20**	3	Int.	●	**0510X3DB**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0510X5DB**	39	1.535	42	1.654	89	3.504	6	.2362
5.159	**.2031**	**13/64**			3	Int.	●	**0516X3D060**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0516X5D060**	39	1.535	42	1.654	89	3.504	6	.2362
5.2	**.2047**				3	Int.	●	**0520X3DB**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0520X5DB**	39	1.535	42	1.654	89	3.504	6	.2362
5.3	**.2087**				3	Int.	●	**0530X3DB**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0530X5DB**	39	1.535	42	1.654	89	3.504	6	.2362
5.4	**.2126**		**3**	**1/4-28**	3	Int.	●	**0540X3DB**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0540X5DB**	39	1.535	42	1.654	89	3.504	6	.2362
5.5	**.2165**				3	Int.	●	**0550X3DB**	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0550X5DB**	39	1.535	42	1.654	89	3.504	6	.2362
5.556	**.2188**	**7/32**			3	Int.	●	**0556X3D060**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0556X5D060**	42	1.654	42	1.654	89	3.504	6	.2362
5.6	**.2205**				3	Int.	●	**0560X3DB**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0560X5DB**	42	1.654	42	1.654	89	3.504	6	.2362
5.7	**.2244**				3	Int.	●	**0570X3DB**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0570X5DB**	42	1.654	42	1.654	89	3.504	6	.2362
5.8	**.2283**		**1**		3	Int.	●	**0580X3DB**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0580X5DB**	42	1.654	42	1.654	89	3.504	6	.2362
5.9	**.2323**				3	Int.	●	**0590X3DB**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0590X5DB**	42	1.654	42	1.654	89	3.504	6	.2362
5.953	**.2344**	**15/64**			3	Int.	●	**0595X3D060**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0595X5D060**	42	1.654	42	1.654	89	3.504	6	.2362
6.0	**.2362**			**M7x1.0**	3	Int.	●	**0600X3DB**	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	**0600X5DB**	42	1.654	42	1.654	89	3.504	6	.2362
6.1	**.2402**				3	Int.	●	**0610X3DB**	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	**0610X5DB**	46	1.811	48	1.890	95	3.740	8	.3150
6.2	**.2441**				3	Int.	●	**0620X3DB**	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	**0620X5DB**	46	1.811	48	1.890	95	3.740	8	.3150

Solid Carbide Drill for Stainless Steel

MMS

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
6.3	.2480				3	Int.	●	MMS0630X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0630X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.350	.2500	1/4	E		3	Int.	●	0635X3D080	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0635X5D080	46	1.811	48	1.890	95	3.740	8	.3150
6.4	.2520				3	Int.	●	0640X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0640X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.5	.2559				3	Int.	●	0650X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0650X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.528	.2570		F	5/16-18	3	Int.	●	0653X3D080	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0653X5D080	49	1.929	51	2.008	98	3.858	8	.3150
6.6	.2598				3	Int.	●	0660X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0660X5DB	49	1.929	51	2.008	98	3.858	8	.3150
6.7	.2638			M8x1.25	3	Int.	●	0670X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0670X5DB	49	1.929	51	2.008	98	3.858	8	.3150
6.747	.2656	17/64			3	Int.	●	0675X3D080	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0675X5D080	49	1.929	51	2.008	98	3.858	8	.3150
6.8	.2677				3	Int.	●	0680X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0680X5DB	49	1.929	51	2.008	98	3.858	8	.3150
6.9	.2717		I	5/16-24	3	Int.	●	0690X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0690X5DB	49	1.929	51	2.008	98	3.858	8	.3150
7.0	.2756			M8x1.0	3	Int.	●	0700X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0700X5DB	49	1.929	51	2.008	98	3.858	8	.3150
7.1	.2795				3	Int.	●	0710X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0710X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.144	.2812	9/32			3	Int.	●	0714X3D080	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0714X5D080	53	2.087	56	2.205	103	4.055	8	.3150
7.2	.2835				3	Int.	●	0720X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0720X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.3	.2874				3	Int.	●	0730X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0730X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.4	.2913				3	Int.	●	0740X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0740X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.5	.2953				3	Int.	●	0750X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0750X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.541	.2969	19/64			3	Int.	●	0754X3D080	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0754X5D080	56	2.205	56	2.205	103	4.055	8	.3150
7.6	.2992				3	Int.	●	0760X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0760X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.7	.3031				3	Int.	●	0770X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0770X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.8	.3071				3	Int.	●	0780X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0780X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.9	.3110				3	Int.	●	0790X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0790X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.938	.3125	5/16		3/8-16	3	Int.	●	0794X3D080	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0794X5D080	56	2.205	56	2.205	103	4.055	8	.3150
8.0	.3150				3	Int.	●	0800X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0800X5DB	56	2.205	56	2.205	103	4.055	8	.3150

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

● : **Inventory maintained in Japan.**

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
8.1	.3189				3	Int.	●	MMS0810X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0810X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.2	.3228				3	Int.	●	0820X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0820X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.3	.3268				3	Int.	●	0830X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0830X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.334	.3281	21/64			3	Int.	●	0833X3D100	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0833X5D100	60	2.362	62	2.441	113	4.449	10	.3937
8.4	.3307				3	Int.	●	0840X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0840X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.433	.3320		Q	3/8-24	3	Int.	●	0843X3D100	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0843X5D100	60	2.362	62	2.441	113	4.449	10	.3937
8.5	.3346			M10x1.5	3	Int.	●	0850X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0850X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.6	.3386				3	Int.	●	0860X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0860X5DB	63	2.480	65	2.559	116	4.567	10	.3937
8.7	.3425			M10x1.25	3	Int.	●	0870X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0870X5DB	63	2.480	65	2.559	116	4.567	10	.3937
8.731	.3438	11/32			3	Int.	●	0873X3D100	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0873X5D100	63	2.480	65	2.559	116	4.567	10	.3937
8.8	.3465				3	Int.	●	0880X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0880X5DB	63	2.480	65	2.559	116	4.567	10	.3937
8.9	.3504				3	Int.	●	0890X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0890X5DB	63	2.480	65	2.559	116	4.567	10	.3937
9.0	.3543				3	Int.	●	0900X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0900X5DB	63	2.480	65	2.559	116	4.567	10	.3937
9.1	.3583				3	Int.	●	0910X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0910X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.128	.3594	23/64			3	Int.	●	0913X3D100	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0913X5D100	67	2.638	70	2.756	121	4.764	10	.3937
9.2	.3622				3	Int.	●	0920X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0920X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.3	.3661				3	Int.	●	0930X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0930X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.347	.3680		U	7/16-14	3	Int.	●	0935X3D100	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0935X5D100	67	2.638	70	2.756	121	4.764	10	.3937
9.4	.3701				3	Int.	●	0940X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0940X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.5	.3740				3	Int.	●	0950X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0950X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.525	.3750	3/8			3	Int.	●	0953X3D100	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0953X5D100	70	2.756	70	2.756	121	4.764	10	.3937
9.6	.3780				3	Int.	●	0960X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0960X5DB	70	2.756	70	2.756	121	4.764	10	.3937
9.7	.3819		Tube sheet		3	Int.	●	0970X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0970X5DB	70	2.756	70	2.756	121	4.764	10	.3937
9.8	.3858				3	Int.	●	0980X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0980X5DB	70	2.756	70	2.756	121	4.764	10	.3937

Solid Carbide Drill for Stainless Steel

MMS

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
9.9	.3898				3	Int.	●	MMS0990X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0990X5DB	70	2.756	70	2.756	121	4.764	10	.3937
9.922	.3906	25/64		7/16-20	3	Int.	●	0992X3D100	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0992X5D100	70	2.756	70	2.756	121	4.764	10	.3937
10.0	.3937				3	Int.	●	1000X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	1000X5DB	70	2.756	70	2.756	121	4.764	10	.3937
10.1	.3976				3	Int.	●	1010X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1010X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.2	.4016			M12x1.75	3	Int.	●	1020X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1020X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.3	.4055				3	Int.	●	1030X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1030X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.319	.4062	13/32			3	Int.	●	1032X3D120	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1032X5D120	74	2.913	78	3.071	134	5.276	12	.4724
10.4	.4094				3	Int.	●	1040X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1040X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.5	.4134				3	Int.	●	1050X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1050X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.6	.4173				3	Int.	●	1060X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1060X5DB	77	3.031	78	3.071	134	5.276	12	.4724
10.7	.4213				3	Int.	●	1070X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1070X5DB	77	3.031	78	3.071	134	5.276	12	.4724
10.716	.4219	27/64		1/2-13	3	Int.	●	1072X3D120	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1072X5D120	77	3.031	78	3.071	134	5.276	12	.4724
10.8	.4252			M12X1.25	3	Int.	●	1080X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1080X5DB	77	3.031	78	3.071	134	5.276	12	.4724
10.9	.4291				3	Int.	●	1090X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1090X5DB	77	3.031	78	3.071	134	5.276	12	.4724
11.0	.4331				3	Int.	●	1100X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1100X5DB	77	3.031	78	3.071	134	5.276	12	.4724
11.1	.4370				3	Int.	●	1110X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1110X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.113	.4375	7/16			3	Int.	●	1111X3D120	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1111X5D120	81	3.189	84	3.307	140	5.512	12	.4724
11.2	.4409				3	Int.	●	1120X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1120X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.3	.4449				3	Int.	●	1130X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1130X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.4	.4488				3	Int.	●	1140X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1140X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.5	.4528				3	Int.	●	1150X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1150X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.509	.4531	29/64		1/2-20	3	Int.	●	1151X3D120	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1151X5D120	84	3.307	84	3.307	140	5.512	12	.4724
11.6	.4567				3	Int.	●	1160X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1160X5DB	84	3.307	84	3.307	140	5.512	12	.4724
11.7	.4606				3	Int.	●	1170X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1170X5DB	84	3.307	84	3.307	140	5.512	12	.4724

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

● : **Inventory maintained.**

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
11.8	.4646				3	Int.	●	MMS1180X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1180X5DB	84	3.307	84	3.307	140	5.512	12	.4724
11.9	.4685	15/32			3	Int.	●	1190X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1190X5DB	84	3.307	84	3.307	140	5.512	12	.4724
12.0	.4724			M14x2.0	3	Int.	●	1200X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1200X5DB	84	3.307	84	3.307	140	5.512	12	.4724
12.1	.4764				3	Int.	●	1210X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1210X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.2	.4803				3	Int.	●	1220X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1220X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.3	.4843	31/64		9/16-12	3	Int.	●	1230X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1230X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.4	.4882				3	Int.	●	1240X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1240X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.5	.4921			M14x1.5	3	Int.	●	1250X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1250X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.6	.4961				3	Int.	●	1260X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1260X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.7	.5000	1/2			3	Int.	●	1270X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1270X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.8	.5039				3	Int.	●	1280X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1280X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.9	.5079				3	Int.	●	1290X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1290X5DB	91	3.583	92	3.622	148	5.827	14	.5512
13.0	.5118				3	Int.	●	1300X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1300X5DB	91	3.583	92	3.622	148	5.827	14	.5512
13.1	.5157	33/64		9/16-18	3	Int.	●	1310X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1310X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.2	.5197				3	Int.	●	1320X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1320X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.3	.5236				3	Int.	●	1330X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1330X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.4	.5276				3	Int.	●	1340X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1340X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.5	.5315	17/32		5/8-11	3	Int.	●	1350X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1350X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.6	.5354				3	Int.	●	1360X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1360X5DB	98	3.858	98	3.858	154	6.063	14	.5512
13.7	.5394				3	Int.	●	1370X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1370X5DB	98	3.858	98	3.858	154	6.063	14	.5512
13.8	.5433				3	Int.	●	1380X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1380X5DB	98	3.858	98	3.858	154	6.063	14	.5512
13.891	.5469	35/64			3	Int.	●	1389X3D140	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1389X5D140	98	3.858	98	3.858	154	6.063	14	.5512
13.9	.5472				3	Int.	●	1390X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1390X5DB	98	3.858	98	3.858	154	6.063	14	.5512
14.0	.5512			M16x2.0	3	Int.	●	1400X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1400X5DB	98	3.858	98	3.858	154	6.063	14	.5512

Solid Carbide Drill for Stainless Steel

MMS

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
14.1	.5551				3	Int.	●	MMS1410X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1410X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.2	.5591				3	Int.	●	1420X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1420X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.288	.5625	9/16			3	Int.	●	1429X3D160	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1429X5D160	102	4.016	106	4.173	165	6.496	16	.6299
14.3	.5630				3	Int.	●	1430X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1430X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.4	.5670				3	Int.	●	1440X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1440X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.5	.5709			M16x1.5	3	Int.	●	1450X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1450X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.6	.5748				3	Int.	●	1460X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1460X5DB	105	4.134	106	4.173	165	6.496	16	.6299
14.684	.5781	37/64		5/8-18	3	Int.	●	1468X3D160	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1468X5D160	105	4.134	106	4.173	165	6.496	16	.6299
14.7	.5787				3	Int.	●	1470X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1470X5DB	105	4.134	106	4.173	165	6.496	16	.6299
14.8	.5827				3	Int.	●	1480X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1480X5DB	105	4.134	106	4.173	165	6.496	16	.6299
14.9	.5866				3	Int.	●	1490X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1490X5DB	105	4.134	106	4.173	165	6.496	16	.6299
15.0	.5906				3	Int.	●	1500X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1500X5DB	105	4.134	106	4.173	165	6.496	16	.6299
15.081	.5938	19/32			3	Int.	●	1508X3D160	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1508X5D160	109	4.291	112	4.409	171	6.732	16	.6299
15.1	.5945				3	Int.	●	1510X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1510X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.2	.5984				3	Int.	●	1520X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1520X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.3	.6024				3	Int.	●	1530X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1530X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.4	.6063				3	Int.	●	1540X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1540X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.478	.6094	39/64			3	Int.	●	1548X3D160	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1548X5D160	109	4.291	112	4.409	171	6.732	16	.6299
15.5	.6102			M18x2.5	3	Int.	●	1550X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1550X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.6	.6142				3	Int.	●	1560X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1560X5DB	112	4.409	112	4.409	171	6.732	16	.6299
15.7	.6181				3	Int.	●	1570X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1570X5DB	112	4.409	112	4.409	171	6.732	16	.6299
15.8	.6220				3	Int.	●	1580X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1580X5DB	112	4.409	112	4.409	171	6.732	16	.6299
15.875	.6250	5/8			3	Int.	●	1588X3D160	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1588X5D160	112	4.409	112	4.409	171	6.732	16	.6299
15.9	.6260				3	Int.	●	1590X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1590X5DB	112	4.409	112	4.409	171	6.732	16	.6299

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

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

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
16.0	**.6299**				3	Int.	●	**MMS1600X3DB**	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	**1600X5DB**	112	4.409	112	4.409	171	6.732	16	.6299
16.1	**.6339**				3	Int.	□	**1610X3DB**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1610X5DB**	116	4.567	120	4.724	179	7.047	18	.7087
16.2	**.6378**				3	Int.	□	**1620X3DB**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1620X5DB**	116	4.567	120	4.724	179	7.047	18	.7087
16.272	**.6406**	**41/64**			3	Int.	●	**1627X3D180**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	●	**1627X5D180**	116	4.567	120	4.724	179	7.047	18	.7087
16.3	**.6417**				3	Int.	□	**1630X3DB**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1630X5DB**	116	4.567	120	4.724	179	7.047	18	.7087
16.4	**.6457**				3	Int.	□	**1640X3DB**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1640X5DB**	116	4.567	120	4.724	179	7.047	18	.7087
16.5	**.6496**			**M18x1.5**	3	Int.	●	**1650X3DB**	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	●	**1650X5DB**	116	4.567	120	4.724	179	7.047	18	.7087
16.6	**.6535**				3	Int.	□	**1660X3DB**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1660X5DB**	119	4.685	120	4.724	179	7.047	18	.7087
16.669	**.6562**	**21/32**		**3/4-10**	3	Int.	●	**1667X3D180**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	●	**1667X5D180**	119	4.685	120	4.724	179	7.047	18	.7087
16.7	**.6575**				3	Int.	□	**1670X3DB**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1670X5DB**	119	4.685	120	4.724	179	7.047	18	.7087
16.8	**.6614**				3	Int.	□	**1680X3DB**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1680X5DB**	119	4.685	120	4.724	179	7.047	18	.7087
16.9	**.6654**				3	Int.	□	**1690X3DB**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	**1690X5DB**	119	4.685	120	4.724	179	7.047	18	.7087
17.0	**.6693**		**Tube sheet**		3	Int.	●	**1700X3DB**	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	●	**1700X5DB**	119	4.685	120	4.724	179	7.047	18	.7087
17.066	**.6719**	**43/64**			3	Int.	●	**1707X3D180**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	**1707X5D180**	123	4.843	126	4.961	185	7.283	18	.7087
17.1	**.6732**				3	Int.	□	**1710X3DB**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1710X5DB**	123	4.843	126	4.961	185	7.283	18	.7087
17.2	**.6772**				3	Int.	□	**1720X3DB**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1720X5DB**	123	4.843	126	4.961	185	7.283	18	.7087
17.3	**.6811**				3	Int.	□	**1730X3DB**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1730X5DB**	123	4.843	126	4.961	185	7.283	18	.7087
17.4	**.6850**				3	Int.	□	**1740X3DB**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1740X5DB**	123	4.843	126	4.961	185	7.283	18	.7087
17.463	**.6875**	**11/16**		**3/4-16**	3	Int.	●	**1746X3D180**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	**1746X5D180**	123	4.843	126	4.961	185	7.283	18	.7087
17.5	**.6890**			**M20x2.5**	3	Int.	●	**1750X3DB**	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	**1750X5DB**	123	4.843	126	4.961	185	7.283	18	.7087
17.6	**.6929**				3	Int.	□	**1760X3DB**	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1760X5DB**	126	4.961	126	4.961	185	7.283	18	.7087
17.7	**.6969**				3	Int.	□	**1770X3DB**	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1770X5DB**	126	4.961	126	4.961	185	7.283	18	.7087
17.8	**.7008**				3	Int.	□	**1780X3DB**	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	**1780X5DB**	126	4.961	126	4.961	185	7.283	18	.7087
17.859	**.7031**	**45/64**			3	Int.	●	**1786X3D180**	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	●	**1786X5D180**	126	4.961	126	4.961	185	7.283	18	.7087

Solid Carbide Drill for Stainless Steel

MMS

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L_3		L_2		L_1		D_4	
									mm	inch	mm	inch	mm	inch	mm	inch
17.9	.7047				3	Int.	□	MMS1790X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	1790X5DB	126	4.961	126	4.961	185	7.283	18	.7087
18.0	.7087				3	Int.	●	1800X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	●	1800X5DB	126	4.961	126	4.961	185	7.283	18	.7087
18.1	.7126				3	Int.	□	1810X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1810X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.2	.7165				3	Int.	□	1820X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1820X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.256	.7188	23/32			3	Int.	●	1826X3D200	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	●	1826X5D200	130	5.118	134	5.276	195	7.677	20	.7874
18.3	.7205				3	Int.	□	1830X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1830X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.4	.7244				3	Int.	□	1840X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1840X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.5	.7283			M20x1.5	3	Int.	●	1850X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	●	1850X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.6	.7323				3	Int.	□	1860X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1860X5DB	133	5.236	134	5.276	195	7.677	20	.7874
18.654	.7344	47/64			3	Int.	●	1865X3D200	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	●	1865X5D200	133	5.236	134	5.276	195	7.677	20	.7874
18.7	.7362				3	Int.	□	1870X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1870X5DB	133	5.236	134	5.276	195	7.677	20	.7874
18.8	.7402				3	Int.	□	1880X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1880X5DB	133	5.236	134	5.276	195	7.677	20	.7874
18.9	.7441				3	Int.	□	1890X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1890X5DB	133	5.236	134	5.276	195	7.677	20	.7874
19.0	.7480				3	Int.	●	1900X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	●	1900X5DB	133	5.236	134	5.276	195	7.677	20	.7874
19.050	.7500	3/4			3	Int.	●	1905X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1905X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.1	.7520				3	Int.	□	1910X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1910X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.2	.7559				3	Int.	□	1920X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1920X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.250	.7579		Tube sheet		3	Int.	●	1925X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1925X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.3	.7598				3	Int.	□	1930X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1930X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.4	.7638				3	Int.	□	1940X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1940X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.447	.7656	49/64		7/8-9	3	Int.	●	1945X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1945X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.5	.7677			M22x2.5	3	Int.	●	1950X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1950X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.6	.7717				3	Int.	□	1960X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1960X5DB	140	5.512	140	5.512	201	7.913	20	.7874
19.7	.7756				3	Int.	□	1970X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1970X5DB	140	5.512	140	5.512	201	7.913	20	.7874

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

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

Drill Diameter **D1**					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		**L3**		**L2**		**L1**		**D4**	
									mm	inch	mm	inch	mm	inch	mm	inch
19.8	**.7795**				3	Int.	□	**MMS1980X3DB**	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	**1980X5DB**	140	5.512	140	5.512	201	7.913	20	.7874
19.844	**.7812**	**25/32**			3	Int.	●	**1984X3D200**	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	●	**1984X5D200**	140	5.512	140	5.512	201	7.913	20	.7874
19.9	**.7835**				3	Int.	□	**1990X3DB**	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	**1990X5DB**	140	5.512	140	5.512	201	7.913	20	.7874
20.0	**.7874**				3	Int.	●	**2000X3DB**	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	●	**2000X5DB**	140	5.512	140	5.512	201	7.913	20	.7874

RECOMMENDED CUTTING CONDITIONS

Work Material	No	Hardness	Cutting speed (SFM)	Feed (IPR) Drill Diameter D1			
				ϕ.1181"–ϕ.1535" (ϕ3.0–ϕ3.9mm)	ϕ.1575"–ϕ.2323" (ϕ4.0–ϕ5.9mm)	ϕ.2362"–ϕ.3110" (ϕ6.0–ϕ7.9mm)	ϕ.3150"–ϕ.3898" (ϕ8.0–ϕ9.9mm)
Ferritic, Martensitic Stainless Steel	1	≤200HB	197–**262**–328	.003–**.005**–.007	.004–**.006**–.008	.005–**.007**–.009	.006–**.007**–.009
	2	>200HB	131–**197**–262	.003–**.004**–.007	.004–**.005**–.008	.005–**.006**–.009	.006–**.007**–.009
PH Stainless Steel	3	<450HB	131–**164**–262	.003–**.004**–.007	.004–**.005**–.008	.005–**.006**–.009	.006–**.007**–.009
Austenitic Stainless Steel	4	≤200HB	197–**262**–328	.003–**.005**–.007	.004–**.006**–.008	.005–**.007**–.009	.006–**.007**–.009
	5	>200HB	131–**197**–262	.003–**.004**–.007	.004–**.005**–.008	.005–**.006**–.009	.006–**.007**–.009
Duplex Steel	6	≤280HB	131–**164**–262	.003–**.004**–.007	.004–**.005**–.008	.005–**.006**–.009	.006–**.007**–.009

Work Material	No	Hardness	Cutting speed (SFM)	Feed (IPR) Drill Diameter D1			
				ϕ.3937"–ϕ.4685" (ϕ10.0–ϕ11.9mm)	ϕ.4724"–ϕ.6260" (ϕ12.0–ϕ15.9mm)	ϕ.6299"–ϕ.7835" (ϕ16.0–ϕ19.9mm)	ϕ.7874" (ϕ20.0mm)
Ferritic, Martensitic Stainless Steel	1	≤200HB	164–**197**–230	.006–**.008**–.009	.006–**.008**–.010	.007–**.009**–.010	.007–**.009**–.011
	2	>200HB	131–**164**–197	.006–**.007**–.009	.006–**.007**–.010	.007–**.008**–.010	.007–**.008**–.011
PH Stainless Steel	3	<450HB	98–**131**–164	.006–**.007**–.009	.006–**.007**–.010	.007–**.008**–.010	.007–**.008**–.011
Austenitic Stainless Steel	4	≤200HB	164–**197**–230	.006–**.008**–.009	.006–**.008**–.010	.007–**.009**–.010	.007–**.009**–.011
	5	>200HB	131–**164**–197	.006–**.007**–.009	.006–**.007**–.010	.007–**.008**–.010	.007–**.008**–.011
Duplex Steel	6	≤280HB	98–**131**–164	.006–**.007**–.009	.006–**.007**–.010	.007–**.008**–.010	.007–**.008**–.011

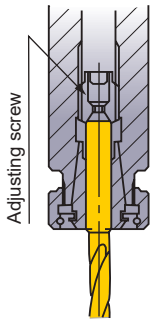
(Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.
(Note 2) Emulsion type of water coolant is recommended.
(Note 3) In non water cutting fluid, reduce the cutting speed by 10%-20%.

Stainless Steel Cross Reference List

Work Material	No	USA	Japan	Germany	
		AISI/SAE	**JIS**	W-no.	DIN
Ferritic, Martensitic Stainless Steel	1	416	SUS416	1.4005	X12CrS3
		410	SUS410	1.4006	X10Cr13
		430	SUS430	1.4016	X6Cr17
		434	SUS434	1.4113	X6CrMo17
		430Ti	SUS430LX	1.4510	X6CrTi17
		409	–	1.4512	X6CrTi12
	2	420	SUS420J1	1.4021	X20Cr13
		431	SUS431	1.4057	X20CrNi17-2
		420	SUS420J2	1.4028	X30Cr13
		440C	SUS440C	1.4125	X10CrMo17
PH Stainless Steel	3	630 (17-4PH)	SUS630	1.4542	X5CrNiCuNb16 4
		S15500 (15-5PH)	–	1.4545	–
		631 (17-7PH)	SUS631	1.4568	X7CrNiAl17 7
Austenitic Stainless Steel	4	304	SUS304	1.4301	X5CrNi18 10
		305	SUS305	1.4303	X5CrNi8-12
		303	SUS303	1.4305	X12CrNiS18-9
		304L	SUS304L	1.4307	X2CrNi19-11
		316	SUS316	1.4401	X5CrNiMo17 12 2
	5	304LN	SUS304LN	1.4311	X2CrNiN18 10
		316L	SUS316L	1.4404	X2CrNiMo17 12 2
		316LN	SUS316LN	1.4406	X2CrNiMoN17 12 2
		–	SUS316L	1.4435	X2CrNiMo18 14 3
		317L	SUS317L	1.4438	X2CrNiMo18 15 4
		N08926	–	1.4529	X1NiCrMoCuN25 20 7
		321	SUS321	1.4541	X6CrNiTi18-10
		347	SUS347	1.4550	X6CrNiNb18-10
		316Ti	SUS316Ti	1.4571	X6CrNiMoTi17 12 2
Duplex Steel	6	–	–	1.4362	X2CrNiN23 4
		S32750	SCS14A	1.4410	X2CrNiMoN25 7 4
		329	SUS329J1	1.4460	X3CrNiMoN27 5 2
		S31803	SUS329J3L	1.4462	X2CrNiMoN22 5 3

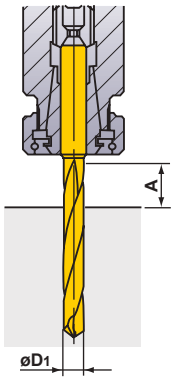
Operational Guidance for the MMS Drill

Drill holding



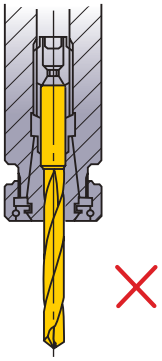
Thrust bearing type collet chuck holds the drill securely.

Drill holding



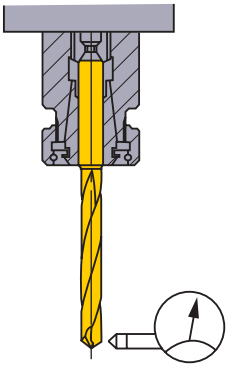
A : ≥ D1 x 1.5

Drill Installation



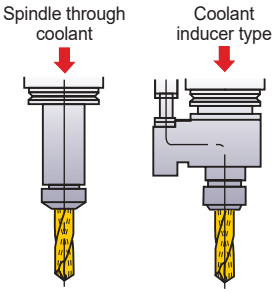
Do not clamp on the flutes.

Installation tolerance



Runout ≤ .001"

Through Coolant Type



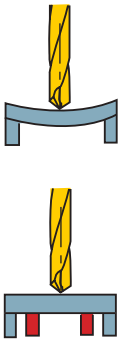
Coolant pressure is approx. 70 - 1015 PSI (0.5 - 7MPa).

Coolant handling

< MMS type >

1) Dirt and dust particles in old coolant can clog the oil hole and prevent effective flow. Regular coolant exchange is recommended.
2) Small particles of swarf will jam in the oil hole. Use a filter as a preventative measure. When using small diameter drills, use a fine mesh filter.

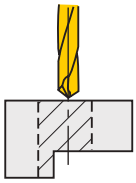
Thin workpieces



If bending occurs ×

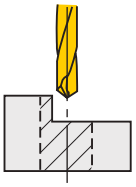
Support the workpiece ○

Interrupted cutting



One process ○

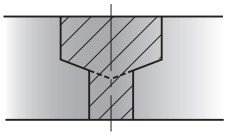
①Lower the feed when drilling the interrupted part.



Requires prior machining △

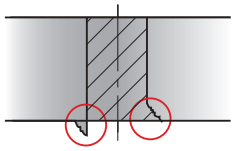
①Spot face with an end mill prior to drilling.

Stepped holes



①Divide the machining into two processes.
②Drill the larger hole first.
*Tools for chamfering and spot facing can be produced to order.

Burring and workpiece chipping



①Lower the feed rate when breaking through.
②Add a chamfer.
③Change the point angle.

Solid Carbide Drill for Stainless Steel

MMS

APPLICATION EXAMPLE

Drill		MMS0560X5DB		MMS0500X5DB		MMS0970X3DB	
Work piece		Austenitic stainless steel AISI 304 Hole depth : .7874 inch		PH stainless steel AISI 630 (17-4PH) Hole depth : 1.1811 inch		Austenitic stainless steel AISI 304L Hole depth : 1 inch	
Component		Medical parts		Spinneret		Heat exchanger parts	
Cutting Conditions	Drill	MMS0560X5DB	Conventional drill	MMS0500X5DB	Conventional drill	MMS0970X3DB	Conventional drill
	Cutting Speed (SFM)	230	128	210	215	325	230
	Feed (IPR)	0.0087	0.0039	0.0079	0.0039	0.009	0.0055
	Revolution (min^{-1})	3979	2217	4074	4210	3249	2297
	Feed Rate (IPM)	34.5	8.7	32	16.5	29.4	12.7
Coolant		Emulsion		Emulsion		Emulsion	
Machine		Machining Center		Machining Center		Machining Center	
Result		●Tool life Cutting length (ft) 0 65.6 131 196.8 MMS 0560X5DB: Drilling possible Conventional drill: Large wear ●Feed rate Feed rate (IPM) 0 7.9 15.7 23.6 31.5 39.4 MMS 0560X5DB Conventional drill: 4 times higher		●Tool life Cutting length (ft) 0 164 328.1 492.1 656.2 MMS 0500X5DB: Drilling possible Conventional drill: Large wear ●Feed rate Feed rate (IPM) 0 7.9 15.7 23.6 31.5 39.4 MMS 0500X5DB Conventional drill: Twice as high		●Tool life Cutting length (ft) 0 196.8 393.7 524.9 MMS 0970X3DB: Drilling possible Conventional drill: Large wear ●Feed rate Feed rate (IPM) 0 7.9 15.7 23.6 31.5 39.4 MMS 0970X3DB Conventional drill: Twice as high	

Memo

MTEC

MACHINING TECHNOLOGY AND EDUCATION CENTER

Welcome to our new world-class Machining Technology and Education Center (MTEC) in Mooresville, NC providing year round support and services to North America.



ABOUT MTEC

TOOLING PROPOSALS & EVALUATION

We will review your current processes or outline a new process. From this review, we will improve productivity, analyze programming methods and output a solution with programming, tooling and time savings.

MACHINING SIMULATION

Using the latest CAD/CAM software and our cutting tool experience, we will outline a new process using proper machining techniques to maximize tool life and productivity.

TECHNICAL SUPPORT

Dedicated local professionals to answer any of your order, product or technical questions.

TRAINING

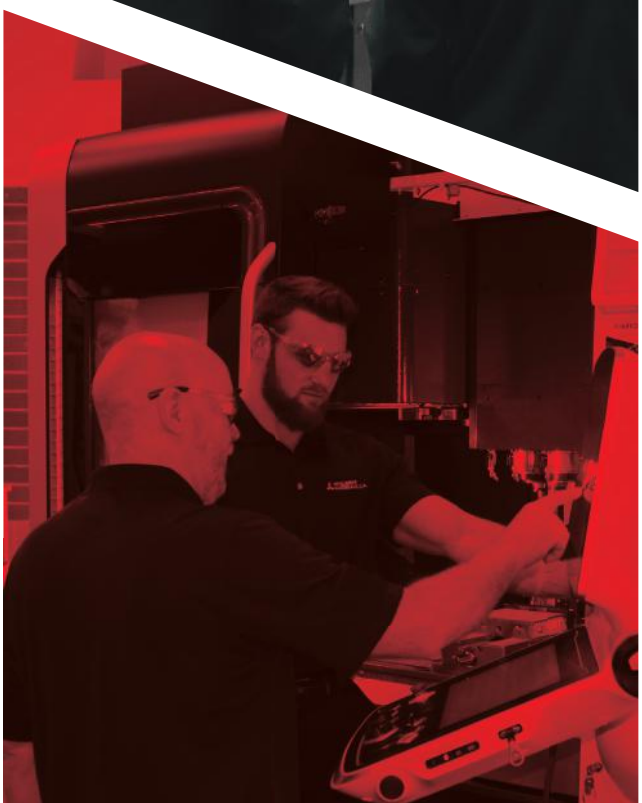
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

PROCESS IMPROVEMENTS

Review of the complete part processing and recommend changes of speed, feed, new tooling, reduction of passes, modifying programming and other solutions to reduce cycle time, save money and be proactive.







WEBINARS

Our FREE online webinar series is available anytime on-demand. Narrated by the MTEC training staff, you will receive in-depth knowledge of the topic. Simply register online at the link below for access. You will receive a certificate upon completion of each course.

mmusnewsstand.com/register

ONLINE TRAINING

Our FREE e-learning program offers 11 courses in drilling, milling, turning, threading, tool grades and workpiece materials. Once each course is completed, you will be given the opportunity to print a certificate.

- Basic Drilling
- Basic Milling
- Basic Turning
- Advanced Drilling
- Advanced End Milling
- Advanced Turning
- Basic Threading
- Advanced Face Milling
- Basic Workpiece Materials
- Tool Grades
- Advanced Workpiece Materials

TRAINING COURSES

Programs are designed for several levels of skill development – from basic understanding to advance manufacturing with digital solutions, complementing to your valued experience in CNC machining environment. Participate in machining demonstrations with Mitsubishi Materials' skilled engineers. Discover methods to reduce setup and cycle time, optimize programs and enhance your knowledge base.

Information on course schedule,
course description, and accommodations

MTECTRAINING.INFO

Follow the QR Code for a virtual facility tour

MITSUBISHI MATERIALS U.S.A.

MITSUBISHI MATERIALS U.S.A. CORPORATION

California Office
(Headquarters)

3535 Hyland Avenue, Suite 200
Costa Mesa, CA 92626
Customer Service: 800.523.0800
Technical Service: 800.486.2341

Chicago Office
(Engineering)

300 N. Martingale Road, Suite 500
Schaumburg, IL 60173
Main: 847.252.6300
Fax: 847.519.1732

MMC Metal de Mexico, S.A. DE C.V.

Av. La Cañada No.16,
Parque Industrial Bernardo
Quintana, El Marques,
Queretaro C.P. 76246 MEXICO
Main: +52.442.221.61.36
Fax: +52.442.221.61.34

North Carolina-MTEC
(Marketing & Technical Center)

105 Corporate Center Drive, Suite A
Mooresville, NC 28117
Main: 980.312.3100
Fax: 704.746.9292

Toronto Office
(Canada Branch)

600 Matheson Blvd. Unit 5 (Office)
Mississauga, ON L5R 4C1
Main: 905.814.0240
Fax: 905.814.0245

Detroit Office
(Moldino CS)

41700 Gardenbrook Road, Suite 120
Novi, MI 48375
Main: 248.308.2620
Fax: 248.308.2627

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.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

B180A-US-2021.12