MITSUBISHI MATERIALS

MAE/MAS

SOLID CARBIDE DRILL FOR ALUMINUM ALLOY AND CAST IRON



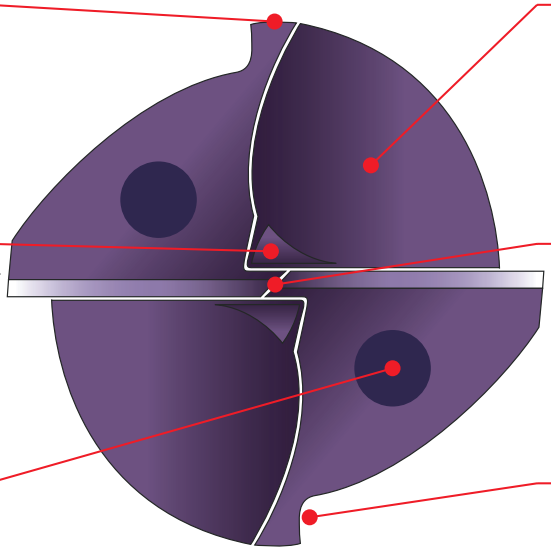


TOOL NEWS **B040A**

Solid Carbide Drill for Aluminum Alloy and Cast Iron

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■ Features



1. Guide Pad

- 4 point support gives high hole accuracy.

2. Curved Cross-section

- Smooth curled chips are produced.
- Good chip control is due to efficient chip breaking.

3. Oil Hole

- Internal oil supply system makes it possible for deep hole drilling.

4. Flutes

- Employs 10° helix angle. Excellent chip discharge allows for high speed and high feed drilling.

5. Center Point

- Initial drilling noise is minimal and deflection does not occur.

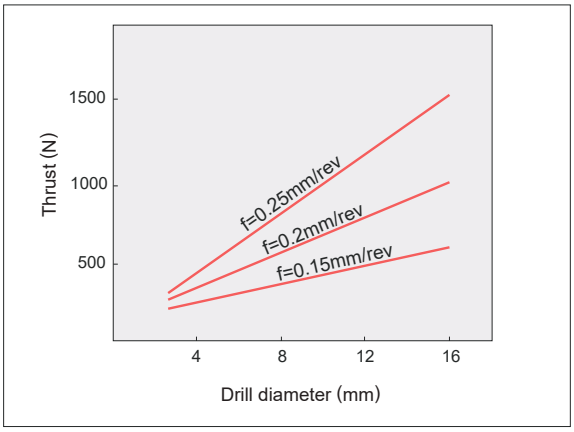
6. Secondary Flutes

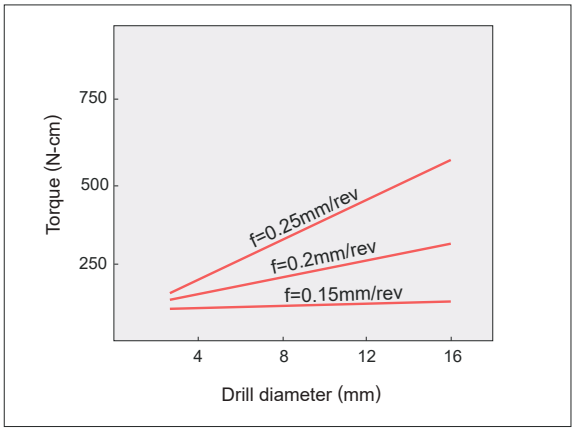
- Cutting oil penetration is effective, so welding is negligible.
- Fine chips are evacuated easily.

■ Cutting performance

● Cutting Resistance

Workpiece : JIS AC4B-T Cutting depth : (L/D=3) through hole Cutting speed : 100m/min Cutting fluid : WSO (10%)





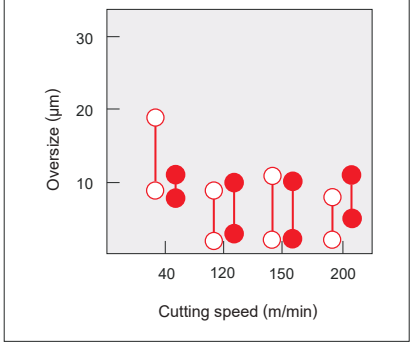
●Drilling Accuracy

■MAE

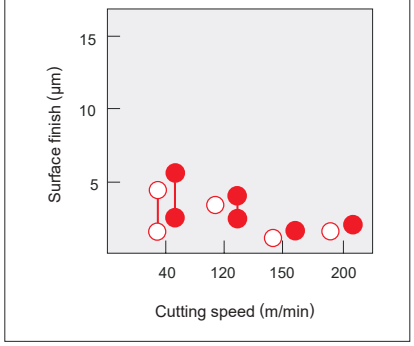
Workpiece : JIS AC4B-T6
Tool : MAE1100MB
Cutting fluid : WSO (10%) Cutting depth : 33mm (L/D=3) Through hole

○——○ ; Feed=0.15mm/rev
●——● ; Feed=0.35mm/rev

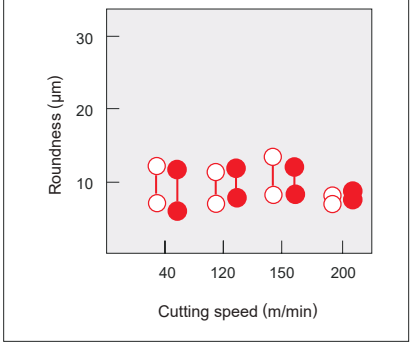
Oversize



Surface finish



Roundness

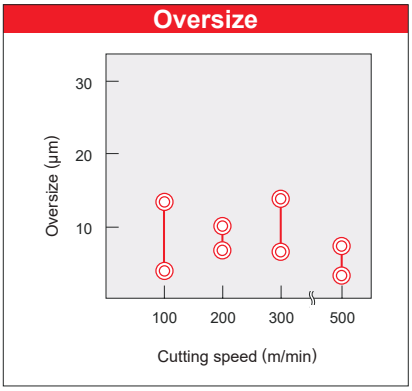


■MAS

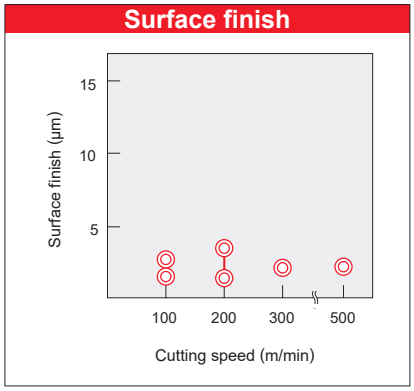
Workpiece : JIS AC4B-T6
Tool : MAS1000LB
Cutting fluid : WSO (10%) Cutting depth : 60mm (L/D=6) Through hole

○——○ ; Feed=0.2mm/rev

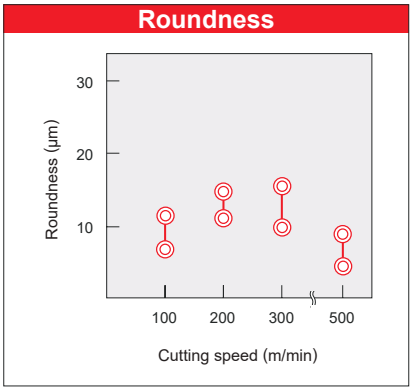
Oversize



Surface finish

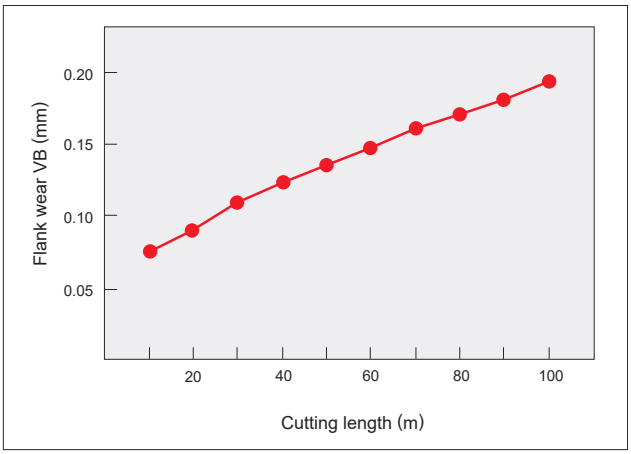


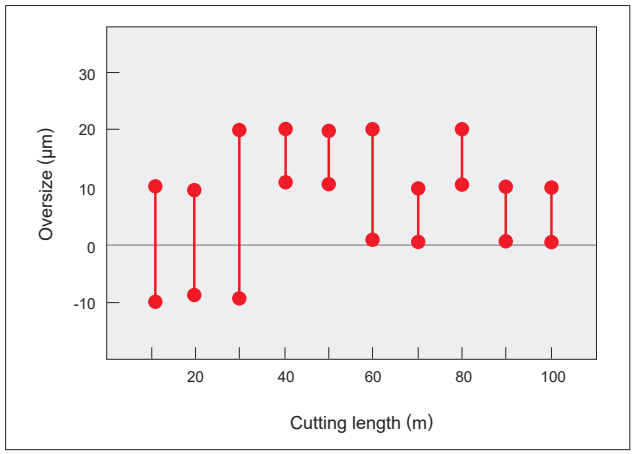
Roundness



●Flank Wear and Oversize Range

Workpiece : JIS AC4B-T6 Feed : 0.25mm/rev
Tool : MAE1100MB Cutting depth : 33mm (L/D=3) Through hole
Cutting speed : 80m/min Cutting fluid : WSO (10%)



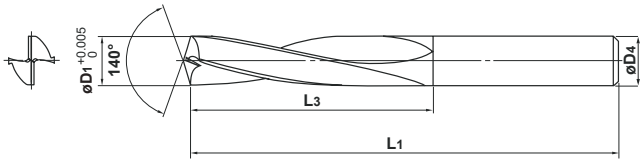


Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

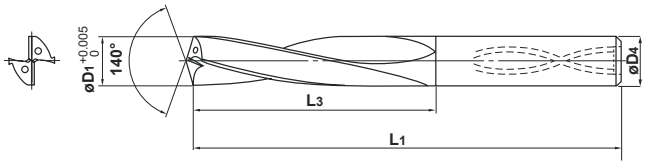
MAE (External Coolant)





MAS (Internal Coolant)





(Note) MAS type bigger than Ø5 have a recess in the end face.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
3.0	3	Ext.	●	MAE0300MB	3	61	21
	3	Int.	□	MAS0300MB	3	61	21
	6	Int.	●	MAS0300LB	3	70	30
3.1	3	Ext.	●	MAE0310MB	4	64	24
	3	Int.	□	MAS0310MB	4	64	24
	6	Int.	●	MAS0310LB	4	74	34
3.2	3	Ext.	●	MAE0320MB	4	64	24
	3	Int.	□	MAS0320MB	4	64	24
	6	Int.	●	MAS0320LB	4	74	34
3.3	3	Ext.	●	MAE0330MB	4	64	24
	3	Int.	□	MAS0330MB	4	64	24
	6	Int.	●	MAS0330LB	4	74	34
3.4	3	Ext.	●	MAE0340MB	4	64	24
	3	Int.	□	MAS0340MB	4	64	24
	6	Int.	●	MAS0340LB	4	74	34
3.5	3	Ext.	●	MAE0350MB	4	64	24
	3	Int.	□	MAS0350MB	4	64	24
	6	Int.	●	MAS0350LB	4	74	34
3.6	3	Ext.	●	MAE0360MB	4	68	28
	3	Int.	□	MAS0360MB	4	68	28
	6	Int.	●	MAS0360LB	4	80	40
3.65	3	Ext.	●	★ MAE0365MB	4	68	28
	3	Int.	□	★ MAS0365MB	4	68	28
	6	Int.	●	★ MAS0365LB	4	80	40
3.7	3	Ext.	●	MAE0370MB	4	68	28
	3	Int.	□	MAS0370MB	4	68	28
	6	Int.	●	MAS0370LB	4	80	40

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
3.8	3	Ext.	●	MAE0380MB	4	68	28
	3	Int.	□	MAS0380MB	4	68	28
	6	Int.	●	MAS0380LB	4	80	40
3.9	3	Ext.	●	MAE0390MB	4	68	28
	3	Int.	□	MAS0390MB	4	68	28
	6	Int.	●	MAS0390LB	4	80	40
4.0	3	Ext.	●	MAE0400MB	4	68	28
	3	Int.	□	MAS0400MB	4	68	28
	6	Int.	●	MAS0400LB	4	80	40
4.1	3	Ext.	●	MAE0410MB	5	71	31
	3	Int.	□	MAS0410MB	5	71	31
	6	Int.	●	MAS0410LB	5	84	44
4.2	3	Ext.	●	MAE0420MB	5	71	31
	3	Int.	□	MAS0420MB	5	71	31
	6	Int.	●	MAS0420LB	5	84	44
4.3	3	Ext.	●	MAE0430MB	5	71	31
	3	Int.	□	MAS0430MB	5	71	31
	6	Int.	●	MAS0430LB	5	84	44
4.4	3	Ext.	●	MAE0440MB	5	71	31
	3	Int.	□	MAS0440MB	5	71	31
	6	Int.	●	MAS0440LB	5	84	44
4.5	3	Ext.	●	MAE0450MB	5	71	31
	3	Int.	□	MAS0450MB	5	71	31
	6	Int.	●	MAS0450LB	5	84	44
4.6	3	Ext.	●	★ MAE0460MB	5	73	33
	3	Int.	□	★ MAS0460MB	5	73	33
	6	Int.	●	★ MAS0460LB	5	88	48

(Note) ★ : Standard hole size for rolled thread tap.

● : USA Stock　　□ : Non stock, produced to order only.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
4.7	3	Ext.	●	MAE0470MB	5	73	33
	3	Int.	□	MAS0470MB	5	73	33
	6	Int.	●	MAS0470LB	5	88	48
4.8	3	Ext.	●	MAE0480MB	5	73	33
	3	Int.	□	MAS0480MB	5	73	33
	6	Int.	●	MAS0480LB	5	88	48
4.9	3	Ext.	●	MAE0490MB	5	73	33
	3	Int.	□	MAS0490MB	5	73	33
	6	Int.	●	MAS0490LB	5	88	48
5.0	3	Ext.	●	MAE0500MB	5	73	33
	3	Int.	●	MAS0500MB	5	73	33
	6	Int.	●	MAS0500LB	5	88	48
5.1	3	Ext.	●	MAE0510MB	6	76	36
	3	Int.	□	MAS0510MB	6	76	36
	6	Int.	●	MAS0510LB	6	92	52
5.2	3	Ext.	●	MAE0520MB	6	76	36
	3	Int.	□	MAS0520MB	6	76	36
	6	Int.	●	MAS0520LB	6	92	52
5.3	3	Ext.	●	MAE0530MB	6	76	36
	3	Int.	□	MAS0530MB	6	76	36
	6	Int.	●	MAS0530LB	6	92	52
5.4	3	Ext.	●	MAE0540MB	6	76	36
	3	Int.	□	MAS0540MB	6	76	36
	6	Int.	●	MAS0540LB	6	92	52
5.5	3	Ext.	●	★ MAE0550MB	6	76	36
	3	Int.	●	★ MAS0550MB	6	76	36
	6	Int.	●	★ MAS0550LB	6	92	52
5.6	3	Ext.	●	MAE0560MB	6	79	39
	3	Int.	□	MAS0560MB	6	79	39
	6	Int.	●	MAS0560LB	6	97	57
5.7	3	Ext.	●	MAE0570MB	6	79	39
	3	Int.	□	MAS0570MB	6	79	39
	6	Int.	●	MAS0570LB	6	97	57

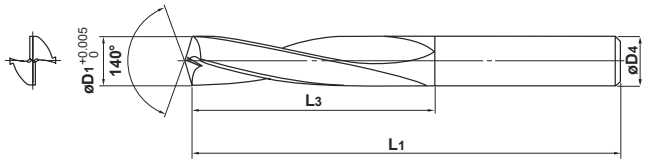
Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
5.8	3	Ext.	●	MAE0580MB	6	79	39
	3	Int.	□	MAS0580MB	6	79	39
	6	Int.	●	MAS0580LB	6	97	57
5.9	3	Ext.	●	MAE0590MB	6	79	39
	3	Int.	□	MAS0590MB	6	79	39
	6	Int.	●	MAS0590LB	6	97	57
6.0	3	Ext.	●	MAE0600MB	6	79	39
	3	Int.	●	MAS0600MB	6	79	39
	6	Int.	●	MAS0600LB	6	97	57
6.1	3	Ext.	●	MAE0610MB	7	84	42
	3	Int.	□	MAS0610MB	7	84	42
	6	Int.	●	MAS0610LB	7	104	62
6.2	3	Ext.	●	MAE0620MB	7	84	42
	3	Int.	□	MAS0620MB	7	84	42
	6	Int.	●	MAS0620LB	7	104	62
6.3	3	Ext.	●	MAE0630MB	7	84	42
	3	Int.	□	MAS0630MB	7	84	42
	6	Int.	●	MAS0630LB	7	104	62
6.4	3	Ext.	●	MAE0640MB	7	84	42
	3	Int.	□	MAS0640MB	7	84	42
	6	Int.	●	MAS0640LB	7	104	62
6.5	3	Ext.	●	MAE0650MB	7	84	42
	3	Int.	●	MAS0650MB	7	84	42
	6	Int.	●	MAS0650LB	7	104	62
6.6	3	Ext.	●	MAE0660MB	7	84	42
	3	Int.	□	MAS0660MB	7	84	42
	6	Int.	●	MAS0660LB	7	107	65
6.7	3	Ext.	●	MAE0670MB	7	84	42
	3	Int.	□	MAS0670MB	7	84	42
	6	Int.	●	MAS0670LB	7	107	65
6.8	3	Ext.	●	MAE0680MB	7	84	42
	3	Int.	●	MAS0680MB	7	84	42
	6	Int.	●	MAS0680LB	7	107	65

Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

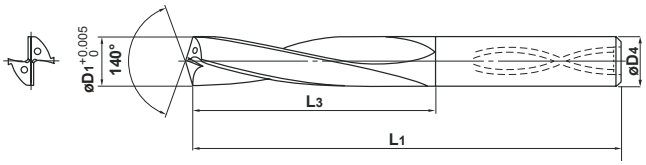
MAE (External Coolant)





MAS (Internal Coolant)





(Note) MAS type bigger than Ø5 have a recess in the end face.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
6.9	3	Ext.	●	MAE0690MB	7	84	42
	3	Int.	□	MAS0690MB	7	84	42
	6	Int.	●	MAS0690LB	7	107	65
7.0	3	Ext.	●	MAE0700MB	7	84	42
	3	Int.	●	MAS0700MB	7	84	42
	6	Int.	●	MAS0700LB	7	107	65
7.1	3	Ext.	●	MAE0710MB	8	90	48
	3	Int.	□	MAS0710MB	8	90	48
	6	Int.	●	MAS0710LB	8	110	68
7.2	3	Ext.	●	MAE0720MB	8	90	48
	3	Int.	□	MAS0720MB	8	90	48
	6	Int.	●	MAS0720LB	8	110	68
7.3	3	Ext.	●	MAE0730MB	8	90	48
	3	Int.	□	MAS0730MB	8	90	48
	6	Int.	●	MAS0730LB	8	110	68
7.35	3	Ext.	●	★ MAE0735MB	8	90	48
	3	Int.	●	★ MAS0735MB	8	90	48
	6	Int.	●	★ MAS0735LB	8	110	68
7.4	3	Ext.	●	MAE0740MB	8	90	48
	3	Int.	□	MAS0740MB	8	90	48
	6	Int.	●	MAS0740LB	8	110	68
7.5	3	Ext.	●	MAE0750MB	8	90	48
	3	Int.	□	MAS0750MB	8	90	48
	6	Int.	●	MAS0750LB	8	110	68
7.6	3	Ext.	●	MAE0760MB	8	90	48
	3	Int.	□	MAS0760MB	8	90	48
	6	Int.	●	MAS0760LB	8	114	72

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
7.7	3	Ext.	●	MAE0770MB	8	90	48
	3	Int.	□	MAS0770MB	8	90	48
	6	Int.	●	MAS0770LB	8	114	72
7.8	3	Ext.	●	MAE0780MB	8	90	48
	3	Int.	□	MAS0780MB	8	90	48
	6	Int.	●	MAS0780LB	8	114	72
7.9	3	Ext.	●	MAE0790MB	8	90	48
	3	Int.	□	MAS0790MB	8	90	48
	6	Int.	●	MAS0790LB	8	114	72
8.0	3	Ext.	●	MAE0800MB	8	90	48
	3	Int.	●	MAS0800MB	8	90	48
	6	Int.	●	MAS0800LB	8	114	72
8.1	3	Ext.	●	MAE0810MB	9	94	50
	3	Int.	□	MAS0810MB	9	94	50
	6	Int.	●	MAS0810LB	9	119	75
8.2	3	Ext.	●	MAE0820MB	9	94	50
	3	Int.	□	MAS0820MB	9	94	50
	6	Int.	●	MAS0820LB	9	119	75
8.3	3	Ext.	●	MAE0830MB	9	94	50
	3	Int.	□	MAS0830MB	9	94	50
	6	Int.	●	MAS0830LB	9	119	75
8.4	3	Ext.	●	MAE0840MB	9	94	50
	3	Int.	□	MAS0840MB	9	94	50
	6	Int.	●	MAS0840LB	9	119	75
8.5	3	Ext.	●	MAE0850MB	9	94	50
	3	Int.	●	MAS0850MB	9	94	50
	6	Int.	●	MAS0850LB	9	119	75

(Note) ★ : Standard hole size for rolled thread tap.

● : USA Stock　　□ : Non stock, produced to order only.

Drill Diameter D_1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D_4	L_1	L_3
8.6	3	Ext.	●	MAE0860MB	9	94	50
	3	Int.	□	MAS0860MB	9	94	50
	6	Int.	●	MAS0860LB	9	121	77
8.7	3	Ext.	●	MAE0870MB	9	94	50
	3	Int.	□	MAS0870MB	9	94	50
	6	Int.	●	MAS0870LB	9	121	77
8.8	3	Ext.	●	MAE0880MB	9	94	50
	3	Int.	□	MAS0880MB	9	94	50
	6	Int.	●	MAS0880LB	9	121	77
8.9	3	Ext.	●	MAE0890MB	9	94	50
	3	Int.	□	MAS0890MB	9	94	50
	6	Int.	●	MAS0890LB	9	121	77
9.0	3	Ext.	●	MAE0900MB	9	94	50
	3	Int.	●	MAS0900MB	9	94	50
	6	Int.	●	MAS0900LB	9	121	77
9.1	3	Ext.	●	MAE0910MB	10	97	53
	3	Int.	□	MAS0910MB	10	97	53
	6	Int.	●	MAS0910LB	10	125	81
9.2	3	Ext.	●	MAE0920MB	10	97	53
	3	Int.	□	MAS0920MB	10	97	53
	6	Int.	●	MAS0920LB	10	125	81
9.21	3	Ext.	●	★ MAE0921MB	10	97	53
	3	Int.	●	★ MAS0921MB	10	97	53
	6	Int.	●	★ MAS0921LB	10	125	81
9.3	3	Ext.	●	MAE0930MB	10	97	53
	3	Int.	□	MAS0930MB	10	97	53
	6	Int.	●	MAS0930LB	10	125	81
9.4	3	Ext.	●	MAE0940MB	10	97	53
	3	Int.	□	MAS0940MB	10	97	53
	6	Int.	●	MAS0940LB	10	125	81
9.5	3	Ext.	●	MAE0950MB	10	97	53
	3	Int.	●	MAS0950MB	10	97	53
	6	Int.	●	MAS0950LB	10	125	81

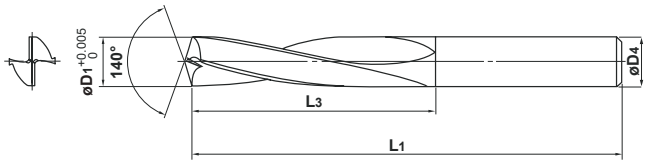
Drill Diameter D_1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D_4	L_1	L_3
9.6	3	Ext.	●	MAE0960MB	10	97	53
	3	Int.	□	MAS0960MB	10	97	53
	6	Int.	●	MAS0960LB	10	125	81
9.7	3	Ext.	●	MAE0970MB	10	97	53
	3	Int.	□	MAS0970MB	10	97	53
	6	Int.	●	MAS0970LB	10	125	81
9.8	3	Ext.	●	MAE0980MB	10	97	53
	3	Int.	□	MAS0980MB	10	97	53
	6	Int.	●	MAS0980LB	10	125	81
9.9	3	Ext.	●	MAE0990MB	10	97	53
	3	Int.	□	MAS0990MB	10	97	53
	6	Int.	●	MAS0990LB	10	125	81
10.0	3	Ext.	●	MAE1000MB	10	97	53
	3	Int.	●	MAS1000MB	10	97	53
	6	Int.	●	MAS1000LB	10	125	81
10.1	3	Ext.	□	MAE1010MB	11	101	55
	3	Int.	□	MAS1010MB	11	101	55
	6	Int.	□	MAS1010LB	11	135	89
10.2	3	Ext.	□	MAE1020MB	11	101	55
	3	Int.	□	MAS1020MB	11	101	55
	6	Int.	□	MAS1020LB	11	135	89
10.3	3	Ext.	●	MAE1030MB	11	101	55
	3	Int.	●	MAS1030MB	11	101	55
	6	Int.	●	MAS1030LB	11	135	89
10.4	3	Ext.	□	MAE1040MB	11	101	55
	3	Int.	□	MAS1040MB	11	101	55
	6	Int.	□	MAS1040LB	11	135	89
10.5	3	Ext.	●	MAE1050MB	11	101	55
	3	Int.	●	MAS1050MB	11	101	55
	6	Int.	●	MAS1050LB	11	135	89
10.6	3	Ext.	□	MAE1060MB	11	101	55
	3	Int.	□	MAS1060MB	11	101	55
	6	Int.	□	MAS1060LB	11	135	89

Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

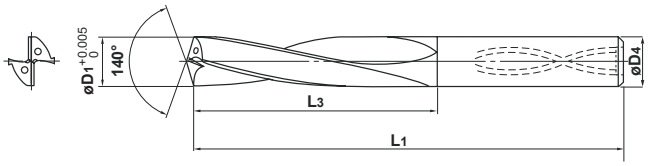
MAE (External Coolant)





MAS (Internal Coolant)





(Note) MAS type bigger than Ø5 have a recess in the end face.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
10.7	3	Ext.	□	MAE1070MB	11	101	55
	3	Int.	□	MAS1070MB	11	101	55
	6	Int.	□	MAS1070LB	11	135	89
10.8	3	Ext.	□	MAE1080MB	11	101	55
	3	Int.	□	MAS1080MB	11	101	55
	6	Int.	□	MAS1080LB	11	135	89
10.9	3	Ext.	□	MAE1090MB	11	101	55
	3	Int.	□	MAS1090MB	11	101	55
	6	Int.	□	MAS1090LB	11	135	89
11.0	3	Ext.	●	MAE1100MB	11	101	55
	3	Int.	●	MAS1100MB	11	101	55
	6	Int.	●	MAS1100LB	11	135	89
11.08	3	Ext.	●	★ MAE1108MB	12	106	60
	3	Int.	●	★ MAS1108MB	12	106	60
	6	Int.	●	★ MAS1108LB	12	140	94
11.1	3	Ext.	□	MAE1110MB	12	106	60
	3	Int.	□	MAS1110MB	12	106	60
	6	Int.	□	MAS1110LB	12	140	94
11.2	3	Ext.	□	MAE1120MB	12	106	60
	3	Int.	□	MAS1120MB	12	106	60
	6	Int.	□	MAS1120LB	12	140	94
11.3	3	Ext.	□	MAE1130MB	12	106	60
	3	Int.	□	MAS1130MB	12	106	60
	6	Int.	□	MAS1130LB	12	140	94
11.4	3	Ext.	□	MAE1140MB	12	106	60
	3	Int.	□	MAS1140MB	12	106	60
	6	Int.	□	MAS1140LB	12	140	94
11.5	3	Ext.	□	MAE1150MB	12	106	60
	3	Int.	□	MAS1150MB	12	106	60
	6	Int.	□	MAS1150LB	12	140	94
11.6	3	Ext.	□	MAE1160MB	12	106	60
	3	Int.	□	MAS1160MB	12	106	60
	6	Int.	□	MAS1160LB	12	140	94
11.7	3	Ext.	□	MAE1170MB	12	106	60
	3	Int.	□	MAS1170MB	12	106	60
	6	Int.	□	MAS1170LB	12	140	94
11.8	3	Ext.	□	MAE1180MB	12	106	60
	3	Int.	□	MAS1180MB	12	106	60
	6	Int.	□	MAS1180LB	12	140	94
11.9	3	Ext.	□	MAE1190MB	12	106	60
	3	Int.	□	MAS1190MB	12	106	60
	6	Int.	□	MAS1190LB	12	140	94
12.0	3	Ext.	●	MAE1200MB	12	106	60
	3	Int.	●	MAS1200MB	12	106	60
	6	Int.	●	MAS1200LB	12	140	94
12.1	3	Ext.	□	MAE1210MB	13	115	65
	3	Int.	□	MAS1210MB	13	115	65
	6	Int.	□	MAS1210LB	13	150	100
12.2	3	Ext.	□	MAE1220MB	13	115	65
	3	Int.	□	MAS1220MB	13	115	65
	6	Int.	□	MAS1220LB	13	150	100
12.3	3	Ext.	□	MAE1230MB	13	115	65
	3	Int.	□	MAS1230MB	13	115	65
	6	Int.	□	MAS1230LB	13	150	100

(Note) ★ : Standard hole size for rolled thread tap.

● : USA Stock　　□ : Non stock, produced to order only.

Drill Diameter D_1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D_4	L_1	L_3
12.4	3	Ext.	□	MAE1240MB	13	115	65
	3	Int.	□	MAS1240MB	13	115	65
	6	Int.	□	MAS1240LB	13	150	100
12.5	3	Ext.	●	MAE1250MB	13	115	65
	3	Int.	●	MAS1250MB	13	115	65
	6	Int.	●	MAS1250LB	13	150	100
12.6	3	Ext.	□	MAE1260MB	13	115	65
	3	Int.	□	MAS1260MB	13	115	65
	6	Int.	□	MAS1260LB	13	150	100
12.7	3	Ext.	□	MAE1270MB	13	115	65
	3	Int.	□	MAS1270MB	13	115	65
	6	Int.	□	MAS1270LB	13	150	100
12.8	3	Ext.	□	MAE1280MB	13	115	65
	3	Int.	□	MAS1280MB	13	115	65
	6	Int.	□	MAS1280LB	13	150	100
12.9	3	Ext.	□	MAE1290MB	13	115	65
	3	Int.	□	MAS1290MB	13	115	65
	6	Int.	□	MAS1290LB	13	150	100
12.96	3	Ext.	●	★ MAE1296MB	13	115	65
	3	Int.	●	★ MAS1296MB	13	115	65
	6	Int.	●	★ MAS1296LB	13	150	100
13.0	3	Ext.	●	MAE1300MB	13	115	65
	3	Int.	●	MAS1300MB	13	115	65
	6	Int.	●	MAS1300LB	13	150	100
13.1	3	Ext.	□	MAE1310MB	14	120	70
	3	Int.	□	MAS1310MB	14	120	70
	6	Int.	□	MAS1310LB	14	160	110
13.2	3	Ext.	□	MAE1320MB	14	120	70
	3	Int.	□	MAS1320MB	14	120	70
	6	Int.	□	MAS1320LB	14	160	110
13.3	3	Ext.	□	MAE1330MB	14	120	70
	3	Int.	□	MAS1330MB	14	120	70
	6	Int.	□	MAS1330LB	14	160	110

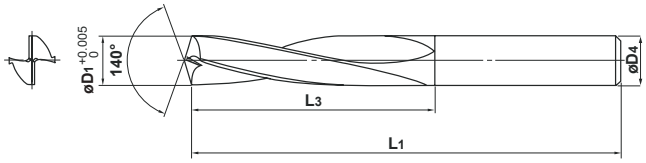
Drill Diameter D_1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D_4	L_1	L_3
13.4	3	Ext.	□	MAE1340MB	14	120	70
	3	Int.	□	MAS1340MB	14	120	70
	6	Int.	□	MAS1340LB	14	160	110
13.5	3	Ext.	●	MAE1350MB	14	120	70
	3	Int.	●	MAS1350MB	14	120	70
	6	Int.	●	MAS1350LB	14	160	110
13.6	3	Ext.	□	MAE1360MB	14	120	70
	3	Int.	□	MAS1360MB	14	120	70
	6	Int.	□	MAS1360LB	14	160	110
13.7	3	Ext.	□	MAE1370MB	14	120	70
	3	Int.	□	MAS1370MB	14	120	70
	6	Int.	□	MAS1370LB	14	160	110
13.8	3	Ext.	□	MAE1380MB	14	120	70
	3	Int.	□	MAS1380MB	14	120	70
	6	Int.	□	MAS1380LB	14	160	110
13.9	3	Ext.	□	MAE1390MB	14	120	70
	3	Int.	□	MAS1390MB	14	120	70
	6	Int.	□	MAS1390LB	14	160	110
14.0	3	Ext.	●	MAE1400MB	14	120	70
	3	Int.	●	MAS1400MB	14	120	70
	6	Int.	●	MAS1400LB	14	160	110
14.1	3	Ext.	□	MAE1410MB	15	130	72
	3	Int.	□	MAS1410MB	15	130	72
	6	Int.	□	MAS1410LB	15	173	115
14.2	3	Ext.	□	MAE1420MB	15	130	72
	3	Int.	□	MAS1420MB	15	130	72
	6	Int.	□	MAS1420LB	15	173	115
14.3	3	Ext.	□	MAE1430MB	15	130	72
	3	Int.	□	MAS1430MB	15	130	72
	6	Int.	□	MAS1430LB	15	173	115
14.4	3	Ext.	□	MAE1440MB	15	130	72
	3	Int.	□	MAS1440MB	15	130	72
	6	Int.	□	MAS1440LB	15	173	115

Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

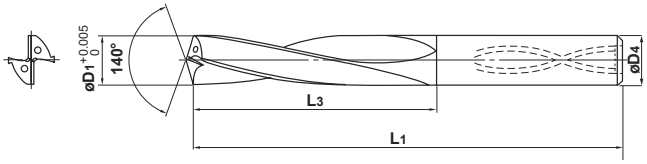
MAE (External Coolant)





MAS (Internal Coolant)





(Note) MAS type bigger than Ø5 have a recess in the end face.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock HTi10	Order Number	Dimension (mm) D4	L1	L3
14.5	3	Ext.	□	MAE1450MB	15	130	72
	3	Int.	□	MAS1450MB	15	130	72
	6	Int.	□	MAS1450LB	15	173	115
14.6	3	Ext.	□	MAE1460MB	15	130	72
	3	Int.	□	MAS1460MB	15	130	72
	6	Int.	□	MAS1460LB	15	173	115
14.7	3	Ext.	□	MAE1470MB	15	130	72
	3	Int.	□	MAS1470MB	15	130	72
	6	Int.	□	MAS1470LB	15	173	115
14.8	3	Ext.	□	MAE1480MB	15	130	72
	3	Int.	□	MAS1480MB	15	130	72
	6	Int.	□	MAS1480LB	15	173	115
14.9	3	Ext.	□	MAE1490MB	15	130	72
	3	Int.	□	MAS1490MB	15	130	72
	6	Int.	□	MAS1490LB	15	173	115
14.96	3	Ext.	●	★ MAE1496MB	15	130	72
	3	Int.	●	★ MAS1496MB	15	130	72
	6	Int.	●	★ MAS1496LB	15	173	115
15.0	3	Ext.	●	MAE1500MB	15	130	72
	3	Int.	●	MAS1500MB	15	130	72
	6	Int.	●	MAS1500LB	15	173	115
15.1	3	Ext.	□	MAE1510MB	16	134	76
	3	Int.	□	MAS1510MB	16	134	76
	6	Int.	□	MAS1510LB	16	178	120
15.2	3	Ext.	□	MAE1520MB	16	134	76
	3	Int.	□	MAS1520MB	16	134	76
	6	Int.	□	MAS1520LB	16	178	120
15.3	3	Ext.	□	MAE1530MB	16	134	76
	3	Int.	□	MAS1530MB	16	134	76
	6	Int.	□	MAS1530LB	16	178	120
15.4	3	Ext.	□	MAE1540MB	16	134	76
	3	Int.	□	MAS1540MB	16	134	76
	6	Int.	□	MAS1540LB	16	178	120
15.5	3	Ext.	□	MAE1550MB	16	134	76
	3	Int.	□	MAS1550MB	16	134	76
	6	Int.	□	MAS1550LB	16	178	120
15.6	3	Ext.	□	MAE1560MB	16	134	76
	3	Int.	□	MAS1560MB	16	134	76
	6	Int.	□	MAS1560LB	16	178	120
15.7	3	Ext.	□	MAE1570MB	16	134	76
	3	Int.	□	MAS1570MB	16	134	76
	6	Int.	□	MAS1570LB	16	178	120
15.8	3	Ext.	□	MAE1580MB	16	134	76
	3	Int.	□	MAS1580MB	16	134	76
	6	Int.	□	MAS1580LB	16	178	120
15.9	3	Ext.	□	MAE1590MB	16	134	76
	3	Int.	□	MAS1590MB	16	134	76
	6	Int.	□	MAS1590LB	16	178	120
16.0	3	Ext.	●	MAE1600MB	16	134	76
	3	Int.	●	MAS1600MB	16	134	76
	6	Int.	●	MAS1600LB	16	178	120

(Note) ★ : Standard hole size for rolled thread tap.

● : USA Stock　　□ : Non stock, produced to order only.

Recommended Cutting Conditions

Workpiece		Tool	Drill Diameter ø3.0 – ø6.0		Drill Diameter ø6.0 – ø10.0		Drill Diameter ø10.0 – ø16.0	
			Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
N	Cast Aluminum Alloy	MAE	90(40－140)	0.15(0.05－0.3)	100(50－150)	0.2(0.1－0.3)	120(60－170)	0.25(0.1－0.4)
	Die Cast Aluminum Alloy		100(60－150)	0.12(0.05－0.25)	110(70－160)	0.15(0.05－ 0.25)	130(80－180)	0.2(0.1－0.3)
K	Cast Iron		40(20－60)	0.15(0.1－0.2)	60(40－80)	0.2(0.1－0.3)	80(60－100)	0.3(0.2－0.4)
	Ductile Cast Iron		30(20－40)	0.1(0.05－0.15)	40(20－60)	0.12(0.05－0.2)	60(40－80)	0.2(0.1－0.3)
N	Cast Aluminum Alloy	MAS	100(60－150)	0.15(0.05－0.3)	120(80－170)	0.2(0.1－0.3)	150(100－200)	0.25(0.1－0.4)
	Die Cast Aluminum Alloy		120(80－170)	0.12(0.05－0.25)	150(100－180)	0.15(0.05－0.25)	160(120－200)	0.2(0.1－0.3)
K	Cast Iron		60(40－80)	0.15(0.1－0.2)	80(60－110)	0.2(0.1－0.3)	100(70－130)	0.3(0.2－0.4)
	Ductile Cast Iron		45(30－60)	0.1(0.05－0.15)	60(40－80)	0.12(0.05－0.2)	80(60－100)	0.2(0.1－0.3)

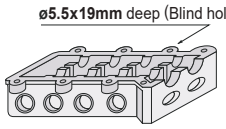
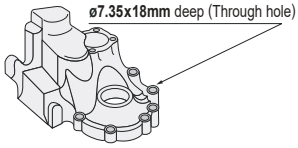
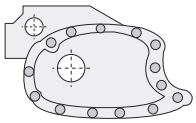
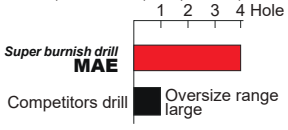
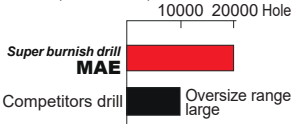
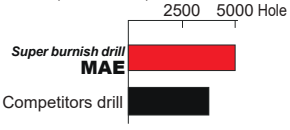
■Hole and Drill Diameters for Thread

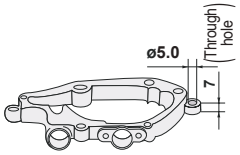
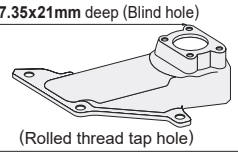
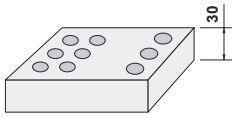
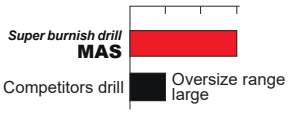
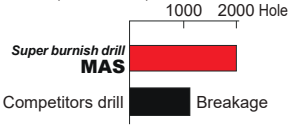
Thread Size	Thread Tapping			Roll Thread Tapping		
	Super Burnish Drill Diameter (**øD₁**)	Hole Diameter Tolerance (**Ø**)		Super Burnish Drill Diameter (**øD₁**)	Hole Diameter Tolerance (**Ø**)	
		Max	Min		Max	Min
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.7
M5x0.8	**4.2**	4.134	4.334	**4.6**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.5**	5.48	5.57
M8x1.25	**6.8**	6.647	6.912	**7.35**	7.34	7.41
M10x1.5	**8.5**	8.376	8.676	**9.21**	9.18	9.28
M12x1.75	**10.3**	10.106	10.441	**11.08**	11.05	11.15
M14x2	**12.0**	11.835	12.21	**12.96**	12.92	13.04
M16x2	**14.0**	13.835	14.21	**14.96**	14.92	15.04

Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

Application Examples

Tool		MAE0550MB	MAE0735MB	MAE0470MB
Workpiece		ISO Al-Si 6 Cu4 Cast Aluminum Alloy 	JIS ADC12 Die Cast Aluminum Alloy 	JIS FC250 Cast Iron 
Component		Cylinder head	Transmission case	Automotive component
Cutting Conditions	Cutting Speed (m/min)	120	100	30
	Feed (mm/rev)	0.1	0.2	0.058
	Revolutions (min-1)	7000	4300	2031
	Feed (mm/min)	700	860	117
Coolant		Water soluble oil	Water soluble oil	Water soluble oil
Results		●Tool life (No. of holes) (x10000) 	●Tool life (No. of holes) 	●Tool life (No. of holes) 

Tool		MAS0500MB	MAS0735MB	MAE1100MB
Workpiece		ISO Al-Si 6 Cu4 Cast Aluminum Alloy 	JIS ACD12 Die Cast Aluminum Alloy 	JIS FCD350 Ductile Cast Iron 
Component		Pump case	Housing	Plate
Cutting Conditions	Cutting Speed (m/min)	78.5	70	60
	Feed (mm/rev)	0.05	0.15	0.25
	Revolutions (min-1)	5000	3000	1740
	Feed (mm/min)	250	450	435
Coolant		Water soluble oil	Water soluble oil	Water soluble oil
Results		●Hole accuracy Tool: Super burnish drill MAS — Results: Oversize (≤20μm) Surface finish (Rmax ≤6.38S) Tool: Competitors drill — Results: Oversize initial hole	●Tool life (No. of holes) 	●Tool life (No. of holes) 

Memo

MTEC

MACHINING TECHNOLOGY AND EDUCATION CENTER

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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

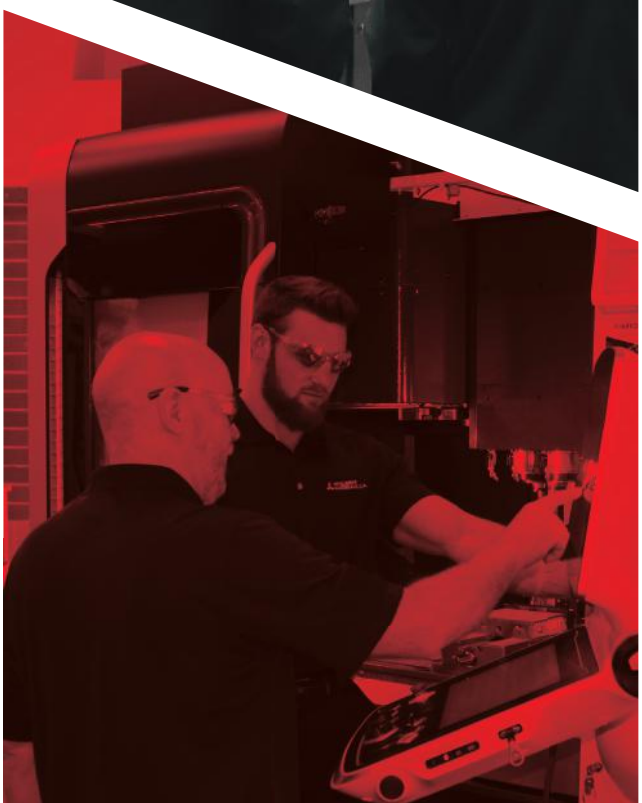
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition 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

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MITSUBISHI MATERIALS U.S.A. CORPORATION

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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.

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