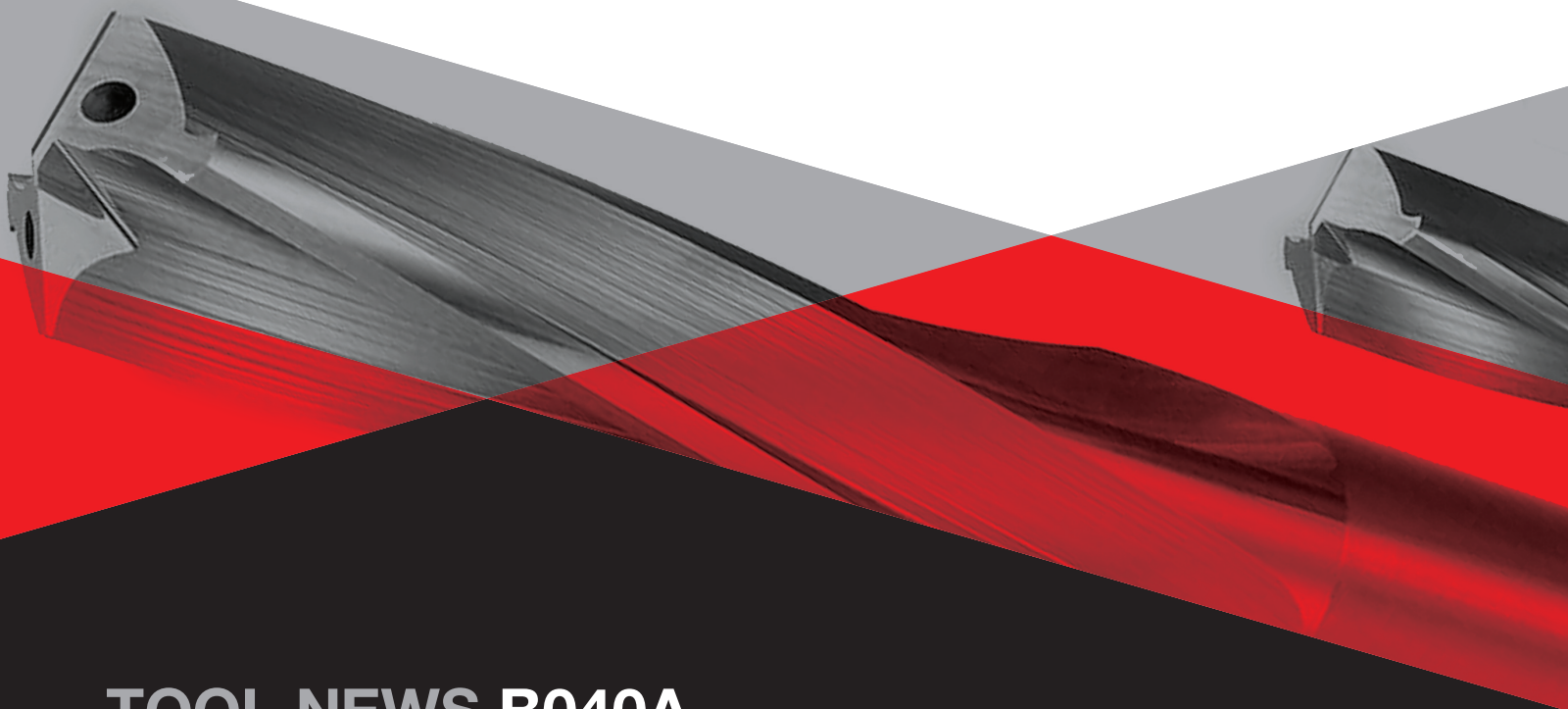


MAE/MAS

SOLID CARBIDE DRILL
FOR ALUMINUM ALLOY
AND CAST IRON



Solid Carbide Drill for Aluminum Alloy and Cast Iron

MAE/MAS

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.

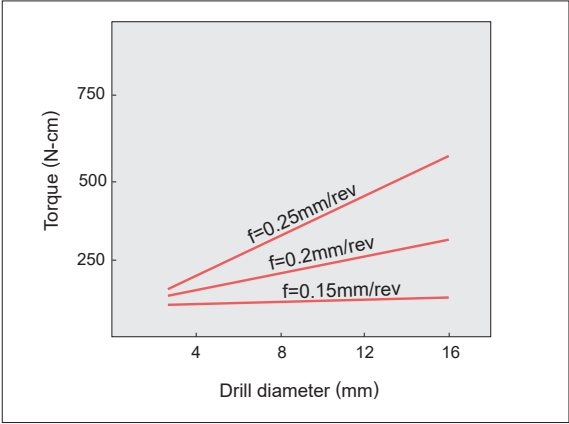
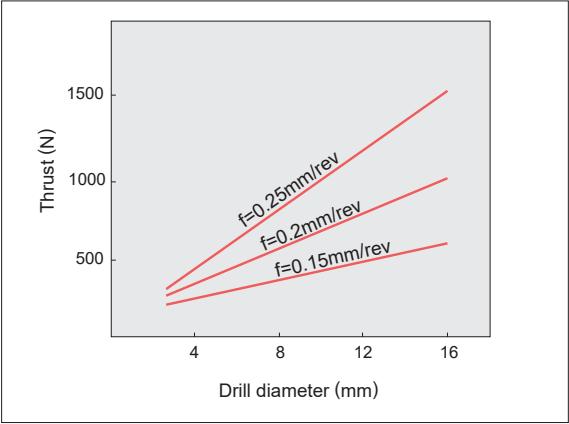
6. Secondary Flutes

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

Cutting performance

Cutting Resistance

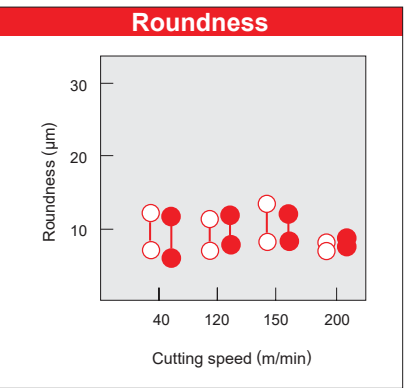
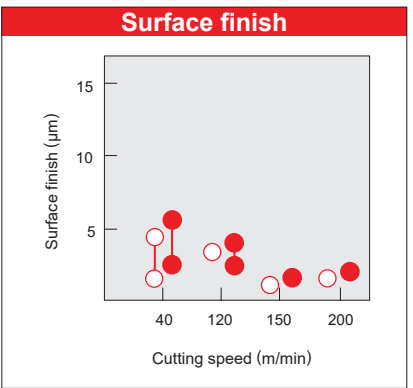
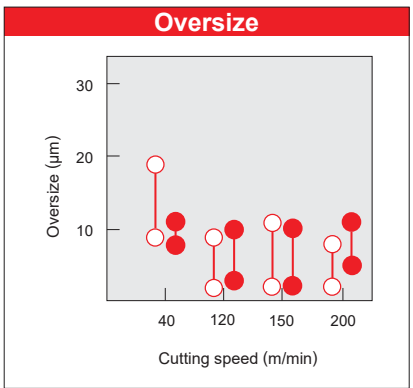
Workpiece : JIS AC4B-T Cutting depth : (L/D=3) through hole Cutting speed : 100m/min Cutting fluid : WSO (10%)



Drilling Accuracy

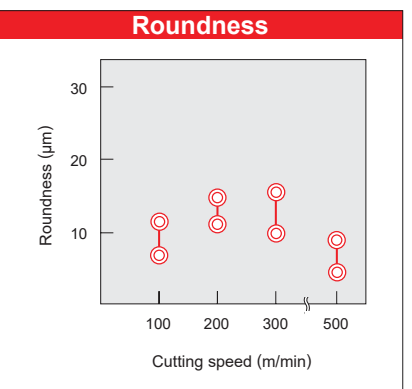
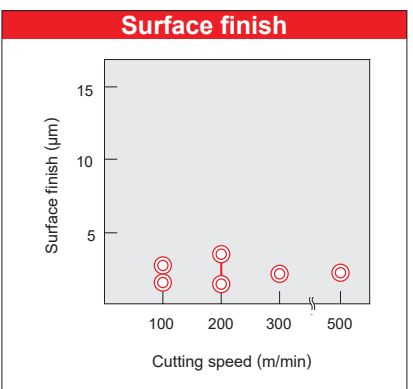
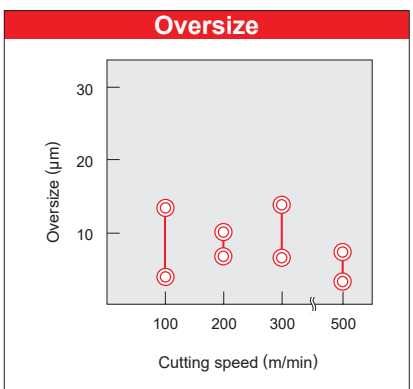
MAE

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



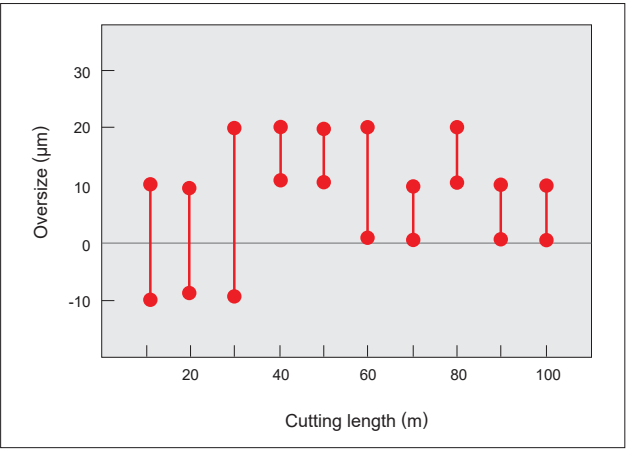
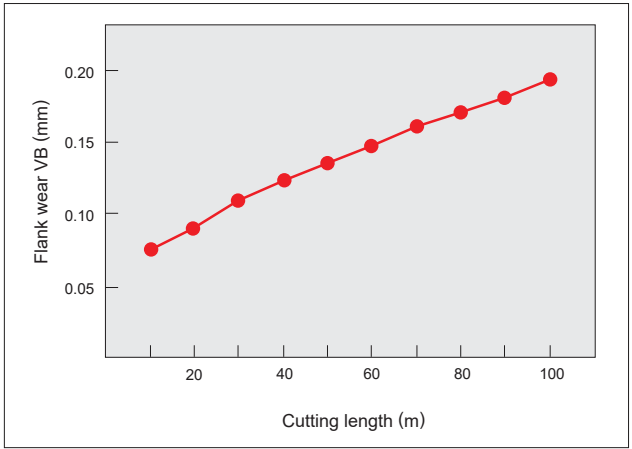
MAS

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



Flank Wear and Oversize Range

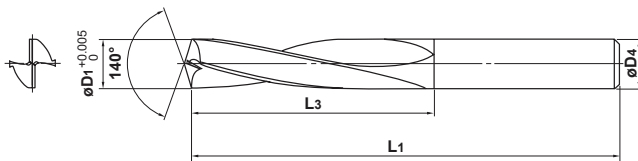
Workpiece : JIS AC4B-T6 Feed : 0.25mm/rev
Tool : MAE1100MB Cutting depth : 33mm (L/D=3) Through hole
Cutting speed : 80m/min Cutting fluid : WSO (10%)



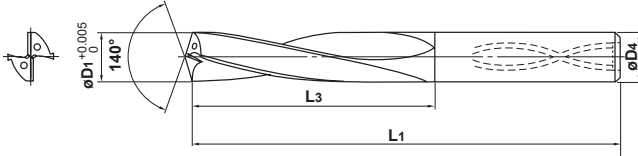
Solid Carbide Drill for Aluminum Alloy and Cast Iron

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	Order Number	Dimension (mm)		
			HT110		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	Order Number	Dimension (mm)		
			HT110		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.

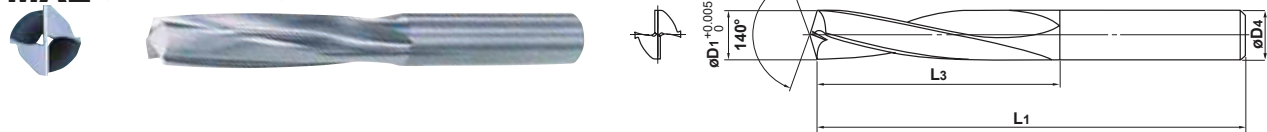
● : USA Stock □ : Non stock, produced to order only.

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		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

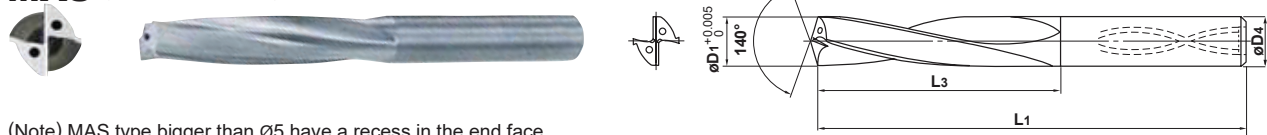
Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
5.8	3	Ext.	●	MAE0580MB	6	79	39
	3	Int.	□	MAS0580MB	6	79	39
	6	Int.	●	MAS0580LB	6	97	57
5.9	3	Ext.	●	MAE0590MB	6	79	39
	3	Int.	□	MAS0590MB	6	79	39
	6	Int.	●	MAS0590LB	6	97	57
6.0	3	Ext.	●	MAE0600MB	6	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

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	Order Number	Dimension (mm)		
			HT110		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	Order Number	Dimension (mm)		
			HT110		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 D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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 D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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

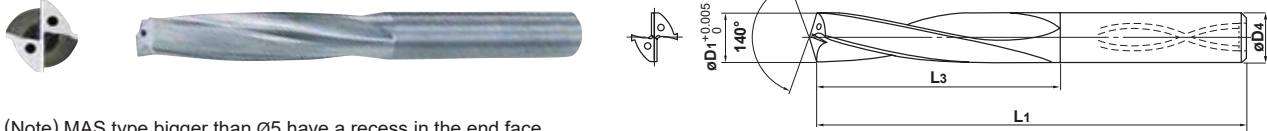
Solid Carbide Drill for Aluminum Alloy and Cast Iron

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	Order Number	Dimension (mm)		
			HT110		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

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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 D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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 D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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

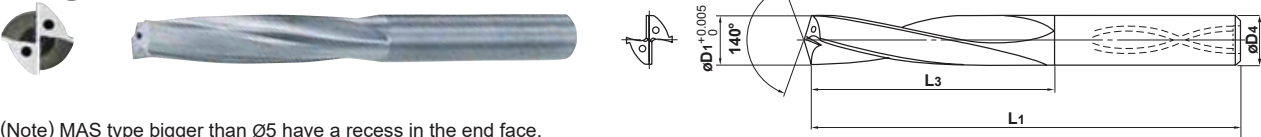
Solid Carbide Drill for Aluminum Alloy and Cast Iron

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	Order Number	Dimension (mm)		
			HT110		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

Drill Diameter D1 (mm)	Hole Depth (l/d)	Coolant	Stock	Order Number	Dimension (mm)		
			HT110		D4	L1	L3
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

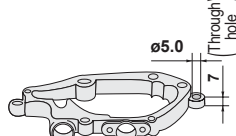
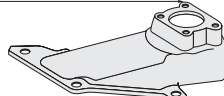
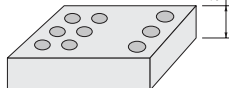
Workpiece	Tool	Drill Diameter ø3.0 – ø6.0		Drill Diameter ø6.0 – ø10.0		Drill Diameter ø10.0 – ø16.0	
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
N	Cast Aluminum Alloy	90(40 – 140)	0.15(0.05 – 0.3)	100(50 – 150)	0.2(0.1 – 0.3)	120(60 – 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	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

MAE/MAS

Tool		MAE0550MB	MAE0735MB	MAE0470MB
Workpiece	ISO AI-Si 6 Cu4 Cast Aluminum Alloy	JIS ADC12 Die Cast Aluminum Alloy	JIS FC250 Cast Iron	
	ø5.5x19mm deep (Blind hole)	ø7.35x18mm deep (Through hole)		
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) Super burnish drill MAE Competitors drill Oversize range large	● Tool life (No. of holes) Super burnish drill MAE Competitors drill Oversize range large	● Tool life (No. of holes) Super burnish drill MAE Competitors drill Oversize range large	

Tool	MAS0500MB	MAS0735MB	MAE1100MB																																	
Workpiece	ISO Al-Si 6 Cu4 Cast Aluminum Alloy 	JIS ACD12 Die Cast Aluminum Alloy ø7.35x21mm deep (Blind hole)  (Rolled thread tap hole)	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 <table><tr><th>Tool</th><th>Results</th></tr><tr><td>Super burnish drill MAS</td><td>Oversize (≤20μm) Surface finish (Rmax ≤6.38S)</td></tr><tr><td>Competitors drill</td><td>Oversize initial hole</td></tr></table>	Tool	Results	Super burnish drill MAS	Oversize (≤20μm) Surface finish (Rmax ≤6.38S)	Competitors drill	Oversize initial hole	● Tool life (No. of holes) <table><tr><th></th><th>5000</th><th>10000</th><th>15000</th><th>Hole</th></tr><tr><td>Super burnish drill MAS</td><td colspan="3"></td><td></td></tr><tr><td>Competitors drill</td><td colspan="3"></td><td>Oversize range large</td></tr></table>		5000	10000	15000	Hole	Super burnish drill MAS					Competitors drill				Oversize range large	● Tool life (No. of holes) <table><tr><th></th><th>1000</th><th>2000</th><th>Hole</th></tr><tr><td>Super burnish drill MAS</td><td colspan="2"></td><td></td></tr><tr><td>Competitors drill</td><td colspan="2"></td><td>Breakage</td></tr></table>		1000	2000	Hole	Super burnish drill MAS				Competitors drill			Breakage
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