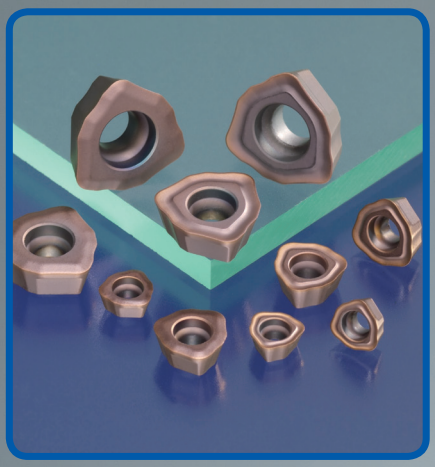
SUMITOMO

CARBIDE - CBN - DIAMOND

CAT.MSXBROCHURE.3/15

High Feed Milling Cutter

MSX Milling Series



High Feed Milling Cutter for applications of Steels, Stainless Steels and Cast Irons

P M K

Ingenious Dynamics

SUMITOMO ELECTRIC

MSX Mill

High Feed Milling Cutter

Features & Benefits

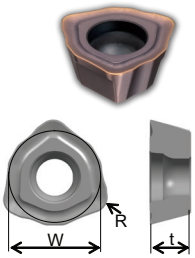
· High feed rates- up to .055 IPT significantly reduces cycle time

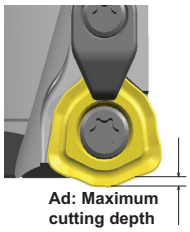
· Higher clamping rigidity due to double clamping system

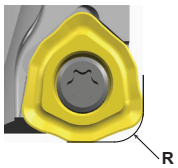
· Capable of ramping and helical applications

· Available in Weldon (EW) and Cylindrical (ELC) type shanks

Up to 0.055 IPT feed rates!







Inserts

General Purpose Insert	Honed Type Insert	ACK200	ACK300	ACP200	ACP300	ACM200	ACM300	Insert Dimensions (in) W	R	t	Max Depth of Cut (in.)
WDMT0603ZDTR	WDMT0603ZDTR-H	●	●	●	●	○	○	.250	.0591	.1181	0.039
WDMT0804ZDTR	WDMT0804ZDTR-H	●	●	●	●	○	○	.335	.0787	.1575	0.059
WDMT1205ZDTR	WDMT1205ZDTR-H	●	●	●	●	○	○	.472	.0787	.1969	0.079
WDMT1406ZDTR	WDMT1406ZDTR-H	●	●	●	●	○	○	.551	0.787	.2362	0.098

○: Available April 1, 2015

Programmed Radius & Ramp Angle Chart

Fig1

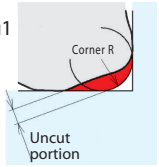
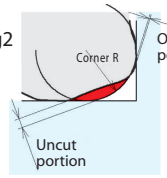


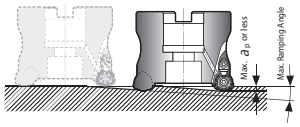
Fig2



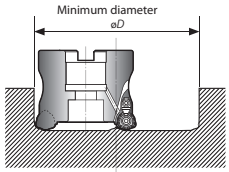
Corner R	MSX20000 Type			MSX30000 Type			MSX40000 Type			MSX50000 Type		
	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig
0.079	0.016	0	1	0.029	0	1	0.052	0	1	0.065	0	1
0.098	0.010	0.0034	2	0.023	0	1	0.046	0	1	0.059	0	1
0.118				0.018	0.0012	2	0.041	0	1	0.054	0	1
0.138							0.035	0.001	2	0.048	0	1
0.158										0.042	0.0006	2

* Actual machined corners will have uncut and over-cut portions due to the shape of the inserts.

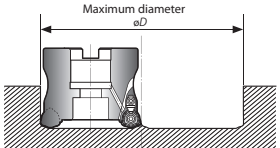
Taper Cutting



Helical Milling



Center uncut portion cannot be removed with same cutter.



Center uncut portion can be removed with same cutter.

øD$_c$	MSX20000 Type			MSX30000 Type			MSX40000 Type			MSX50000 Type		
	Taper Cutting	Helical Milling		Taper Cutting	Helical Milling		Taper Cutting	Helical Milling		Taper Cutting	Helical Milling	
	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.
16 mm	6° 00'	0.83	1.18									
17 mm	5° 00'	0.91	1.26									
18 mm	4° 30'	1.00	1.34									
20 mm	3° 30'	1.14	1.49	7° 30'	1.00	1.49						
22 mm	3° 00'	1.29	1.65	5° 30'	1.14	1.65						
25 mm	2° 00'	1.54	1.89	4° 00'	1.38	1.89						
28 mm				3° 00'	1.61	2.13						
32 mm				2° 30'	1.93	2.44	6° 30'	1.65	2.44			
35 mm				2° 00'	2.17	2.68	5° 00'	1.89	2.68			
40 mm				2° 00'	2.56	3.07	4° 00'	2.28	3.07	6° 00'	2.09	3.07
50 mm							2° 30'	3.07	3.86	3° 30'	2.87	3.86
63 mm							2° 00'	4.06	4.88	2° 00'	3.89	4.88
80 mm										1° 30'	5.24	6.22
100 mm										1° 00'	6.81	7.79
0.75 in.	4° 00'	1.11	1.42									
1.0 in.	2° 00'	1.58	1.92	4° 00'	1.42	1.92						
1.25 in.				2° 30'	1.93	2.40	6° 30'	1.62	2.40			
1.5 in.				1° 30'	2.45	2.91	4° 00'	2.13	2.91			
2.0 in.				1° 00'	3.39	3.91	2° 30'	3.08	3.91	3° 30'	2.90	3.91
2.5 in.							1° 30'	4.08	4.91	2° 30'	3.90	4.91
3.0 in.							1° 00'	5.08	5.91	1° 30'	4.90	5.91
4.0 in.							0° 30'	7.08	7.91	1° 00'	6.90	7.91
5.0 in.										0° 30'	8.90	9.91
6.0 in.										0° 30'	10.90	11.91

Recommended Running Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (sfm) Min - Max	Feed Rate f_z (ipt) Min - Max	Recommended Grade
P	General Steel	>=200HB	330 ~ 660	<0.047	ACP200, ACP300
P	Alloy Steel	>=HRC45	260 ~ 590	<0.047	ACP200, ACP300
M	Stainless Steel	-	260 ~490	<0.031	ACM200, ACM300
K	Cast Iron	-	330 ~ 660	<0.055	ACK200, ACP300

NOTE: The cutting conditions above are a guide. Actual Conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.

Hardware

Hardware					
Screw	Wrench	Clamp	Ring	Clamp Screw	Applicable Cutter
BFTX02505IP	TRDR08IP	-	-	-	MSX20000
BFTX0305IP	TRDR08IP	CCH3.5	CR3	BFTX03510IP08	MSX30000 ≤1.0"
BFTX0306IP	TRDR08IP	CCH3.5	CR3	BFTX03510IP08	MSX30000 >1.0"
BFTX0409IP	TRDR15IP	CCH3.5	CR3	BFTX03510IP15	MSX40000
BFTX0511IP	TRDR20IP	CCH4.5	CR3	BFTXO4513IP20	MSX50000

MSX Endmills

Fig 1

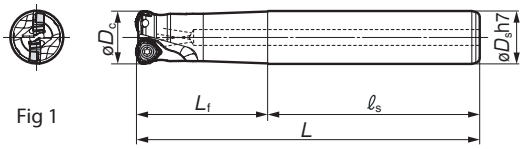
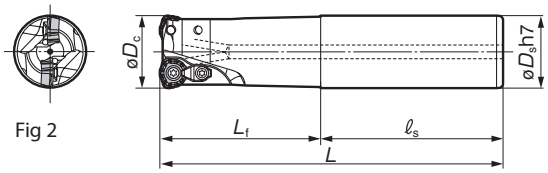


Fig 2



MSX Endmill - Inch

Catalog Number	Stock	Dimensions (in.)					Teeth	Figure	Insert
		D	D4	L1	L2	L3			
MSX20750EW	●	0.750	0.750	5.125	2.000	2.031	3	1	WDMT0603
MSX20750ELC	●	0.750	0.750	8.000	2.000	6.000	3	1	
MSX31000EW	●	1.000	1.000	4.781	2.500	2.281	2	2	WDMT0804
MSX31000ELC	●	1.000	1.000	10.000	2.500	7.500	2	2	
MSX41250EW	●	1.250	1.250	4.781	2.500	2.281	2	2	WDMT1205
MSX41250ELC	●	1.250	1.250	10.000	2.500	7.500	2	2	
MSX41500EW	●	1.500	1.250	4.781	2.500	2.281	2	2	
MSX41500ELC	●	1.500	1.500	10.000	2.500	7.500	2	2	
MSXF31000EW	●	1.000	1.000	4.781	2.500	2.281	3	2	WDMT0804
MSXF31250EW	●	1.250	1.250	4.781	2.500	2.281	3	2	
MSXF31500EW	●	1.500	1.500	4.781	2.500	2.281	4	2	
MSXF41500EW	●	1.500	1.500	4.781	2.500	2.281	3	2	WDMT1205

Fig 1 Single Lock

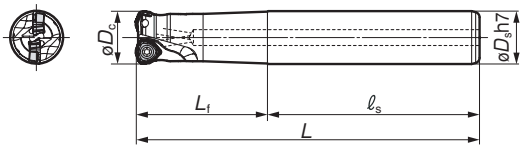
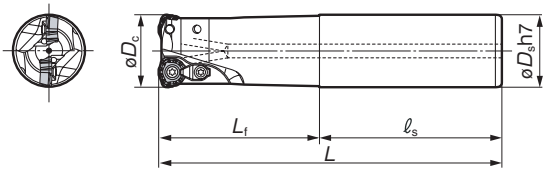


Fig 2 Double Lock



MSX Endmill - Metric Insert: WDMT06 Type

Catalog Number	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)	Fig.
		øDc	øDs	Lf	ℓs	L			
MSX06016ES	★	**16**	16	30	80	110	2	0.2	1
MSX06016EM	★	**16**	16	70	80	150	2	0.2	1
MSX06017EM	★	**17**	16	20	130	150	2	0.2	1
MSX06018EM	★	**18**	16	20	130	150	2	0.2	1
MSX06020ES	★	**20**	20	50	80	130	3	0.3	1
MSX06020EM	★	**20**	20	100	80	180	3	0.4	1
MSX06022EM	★	**22**	20	30	150	180	3	0.4	1
MSX06025ES	★	**25**	25	60	80	140	3	0.5	1
MSX06025EM	★	**25**	25	120	130	250	3	0.8	1

MSX Endmill - Metric Insert: WDMT08 Type

Catalog Number	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)	Fig.
		øDc	øDs	Lf	ℓs	L			
MSX08020ES	★	**20**	20	50	80	130	2	0.3	1
MSX08020EM	★	**20**	20	100	80	180	2	0.3	1
MSX08022EM	★	**22**	20	30	150	180	2	0.4	1
MSX08025ES	★	**25**	25	60	80	140	2	0.4	2
MSX08025EM	★	**25**	25	120	130	250	2	0.8	2
MSX08028EM	★	**28**	25	40	210	250	2	0.9	2
MSX08032ES	★	**32**	32	70	80	150	3	0.8	2
MSX08032EM	★	**32**	32	120	130	250	3	1.4	2
MSX08035EM	★	**35**	32	50	200	250	3	1.5	2

Body (MSX12000E) Insert: WDMT12 Type

Catalog Number	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)	Fig.
		øDc	øDs	Lf	ℓs	L			
MSX12032ES	★	**32**	32	70	80	150	2	0.8	2
MSX12032EM	★	**32**	32	120	130	250	2	1.4	2
MSX12035EM	★	**35**	32	50	200	250	2	1.4	2
MSX12040ES	★	**40**	32	50	100	150	3	0.9	2
MSX12040EM	★	**40**	32	50	200	250	3	1.5	2
MSX12050EM	★	**50**	42	50	200	250	4	2.6	2

Body (MSX14000E) Insert: WDMT14 Type

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)	Fig.
		øDc	øDs	Lf	ℓs	L			
MSX14040ES	★	**40**	32	50	100	150	2	0.9	2
MSX14040EM	★	**40**	32	50	200	250	2	1.5	2
MSX14050ES	★	**50**	42	50	100	150	3	1.5	2
MSX14050EM	★	**50**	42	50	200	250	3	2.5	2
MSX14063ES	★	**63**	42	50	100	150	4	1.7	2
MSX14063EM	★	**63**	42	50	200	250	4	2.8	2

★: Worldwide Warehouse Item

MSX Shell Mill

Fig1

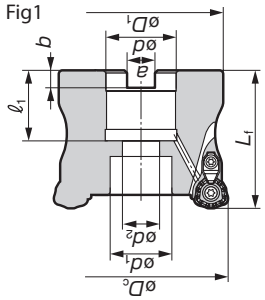
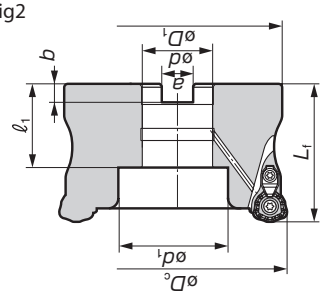


Fig2



MSX Shell Mill - INCH

Catalog Number	Stock	Dimensions (in)									No. of Teeth	Fig.	Insert
		øDc	øD1	Lf	ød	a	b	ℓ1	ød1	ød2			
MSX31500R	○	1.500	1.339	1.530	0.750	0.312	0.190	0.750	0.609	0.406	4	1	WDMT0804
MSX32000R	○	2.000	1.850	2.000	0.750	0.312	0.190	0.750	0.609	0.406	5	1	
MSXM42000R	○	2.000	1.850	2.000	0.750	0.312	0.190	0.750	0.609	0.406	5	1	WDMT1205
MSX42000R	○	2.000	1.850	2.000	0.750	0.312	0.190	0.750	0.609	0.406	4	1	
MSX42500R	○	2.500	2.362	2.000	1.000	0.375	0.220	0.750	0.797	0.530	5	1	
MSX43000R	○	3.000	2.756	2.000	1.000	0.375	0.220	0.750	0.797	0.530	6	1	
MSX44000R-1.25	○	4.000	3.740	2.500	1.250	0.500	0.280	0.750	1.000	0.656	7	1	
MSX44000R-1.50	○	4.000	3.740	2.500	1.500	0.625	0.380	1.000	2.000	0.781	7	2	
MSX52000R	○	2.000	1.850	2.000	0.750	0.312	0.190	0.750	0.609	0.406	4	1	WDMT1406
MSX52500R	○	2.500	2.362	2.000	1.000	0.375	0.220	0.750	0.797	0.531	5	1	
MSX53000R	○	3.000	2.756	2.000	1.000	0.375	0.220	0.750	0.797	0.531	5	1	
MSX54000R	○	4.000	3.740	2.500	1.250	0.500	0.280	0.750	1.000	0.656	6	1	
MSX54000R-1.50	○	4.000	3.740	2.500	1.500	0.625	0.380	1.000	2.000	0.781	7	2	
MSX55000R	○	5.000	3.937	2.500	1.500	0.625	0.380	1.000	2.000	0.781	7	2	
MSX56000R	○	6.000	3.937	2.500	1.500	0.625	0.380	1.000	2.000	0.781	8	2	

○: Available 2nd Quarter 2015

MSX Shell Mill - Metric

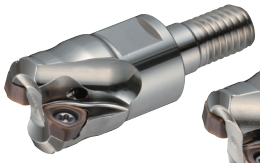
Catalog Number	Stock	Dimensions (mm)									No. of Teeth	Weight (lbs)	Fig.	Insert
		øDc	øD1	Lf	ød	a	b	ℓ1	ød1	ød2				
MSX08040RS	★	40	37	45	16	8.4	5.6	18	13.5	9	4	0.44	1	WDMT0804
MSX12050RS	★	50	47	50	22	10.4	6.3	20	18	11	4	0.66	1	WDMT1205
MSX12063RS	★	63	60	50	22	10.4	6.3	20	18	11	5	1.32	1	
MSX14050RS	★	50	47	50	22	10.4	6.3	20	17	11	3	0.66	1	WDMT1406
MSX14063RS	★	63	60	50	22	10.4	6.3	20	18	11	4	1.32	1	
MSX14080RS	★	80	76	63	27	12.4	7.0	25	20	13.5	5	3.09	1	
MSX14100RS	★	100	96	63	32	14.4	8.5	32	44	-	6	4.85	2	
MSX14080R	★	80	76	63	31.75	12.7	8.0	32	28	17	5	2.86	1	
MSX14100R	★	100	96	63	31.75	12.7	8.0	32	28	17	6	5.29	1	

Please use JISB1176 hexagonal bolt (ø80: M12 × 30-35mm, ø100: M16 × 40-45mm) for securing the ø80 or ø100 cutter to the arbour.

★: Worldwide Warehouse Item

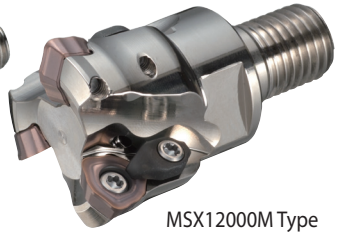
MSX Modular Tooling

Ultra-high speed, high efficiency machining endmill

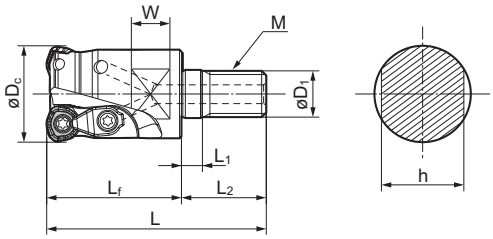


MSX06000M Type
(MSX06000M type only with single clamp)

MSX08000M Type



MSX12000M Type



Modular Head (MSX 06000M) — Applicable Insert WDMT06 Type

Catalog Number	Stock	Dimensions (mm)									No. of Teeth
		øDc	øD1	M	L	Lf	L1	L2	W	h	
MSX06016M08Z2	★	16	8.5	M8	42	25	5	17	8	13	2
MSX06018M08Z2	★	18	8.5	M8	42	25	5	17	8	13	2
MSX06020M10Z3	★	20	10.5	M10	49	30	5	19	8	15	3
MSX06022M10Z3	★	22	10.5	M10	49	30	5	19	8	15	3
MSX06025M12Z3	★	25	12.5	M12	56	35	5	21	10	19	3

Modular Head (MSX 08000M) — Applicable Insert WDMT08 Type

Catalog Number	Stock	Dimensions (mm)									No. of Teeth
		øDc	øD1	M	L	Lf	L1	L2	W	h	
MSX08025M12Z2	★	25	12.5	M12	56	35	5	21	10	19	2
MSX08028M12Z2	★	28	12.5	M12	56	35	5	21	10	19	2
MSX08030M16Z3	★	30	17.0	M16	63	40	5	23	10	24	3
MSX08032M16Z3	★	32	17.0	M16	63	40	5	23	10	24	3
MSX08035M16Z3	★	35	17.0	M16	63	40	5	23	10	24	3

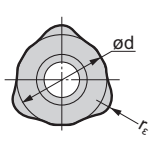
Modular Head (MSX 12000M) — Applicable Insert WDMT12 Type

Catalog Number	Stock	Dimensions (mm)									No. of Teeth
		øDc	øD1	M	L	Lf	L1	L2	W	h	
MSX12032M16Z2	★	32	17.0	M16	63	40	5	23	10	24	2
MSX12035M16Z2	★	35	17.0	M16	63	40	5	23	10	24	2
MSX12040M16Z3	★	40	17.0	M16	63	40	5	23	10	24	3

★Worldwide Warehouse Item

Arbor (see page 333 of the 15/16 Sumitomo General Catalog fo arbors)

Inserts



Usage	Catalog Number	Coated Carbide						Dimensions (mm)		
		ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	ød	s	rε
General Purpose	WDMT0603ZDTR	●	●	●	●	○	○	6.35	3.0	1.5
	WDMT0804ZDTR	●	●	●	●	○	○	8.50	4.0	2.0
	WDMT1205ZDTR	●	●	●	●	○	○	12.00	5.0	2.0
Honed Type	WDMT0603ZDTR-H	●	●	●	●	○	○	6.35	3.0	1.5
	WDMT0804ZDTR-H	●	●	●	●	○	○	8.50	4.0	2.0
	WDMT1205ZDTR-H	●	●	●	●	○	○	12.00	5.0	2.0

● USA stocked item ○: Available April 1, 2015

Modular Head Identification

MSX 06 016 M08 Z2

(1) Cutter Series — (2) Insert Size — (3) Diameter — (4) Mounting Screw — (5) No. of Flutes

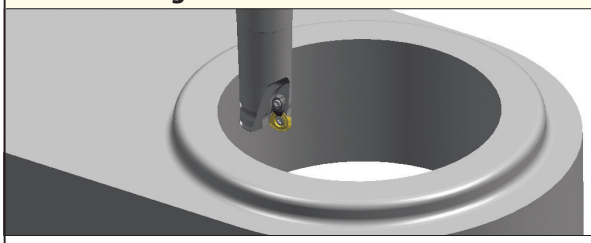
Hardware

Wrench	Screws	Clamp	C ring	Clamp Screw	Recommended Tightening Torque (N•m)	Applicable Head
TRDR08IP	BFTX02505IP	-	-	-	1.5	MSX06000M
	BFTX0306IP	CCH3.5	CR3	BFTX03510IP08	2.0	MSX08000M
TRDR15IP	BFTX0409IP	CCH3.5	CR3	BFTX03510IP15	3.0	MSX12000M

Performance

Tool: MSX12032EM Insert: WDMT1205ZDTR-ACP200 *Actual measurement for an integrated endmill type.

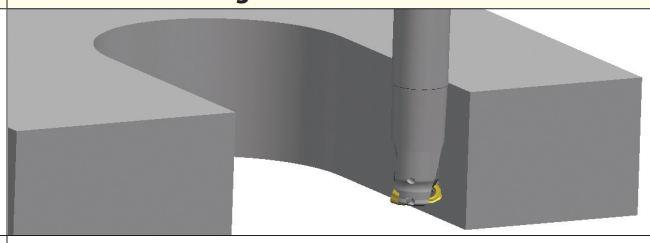
Helical Boring



Work material : 1015
Cutting Conditions : v_c=558 SFM n=1,700min^{-1} f_z=.059 IPT
D.O.C.=.032" Radial=.276" OH=5.315"

**Results: Some chattering but cut edge looks good and provides good chip control.
20% better efficiency than competitor A.
(Chipping found on Comp A's tool)**

Contour Machining



Work material : 4137
Cutting Conditions : v_c=492 SFM n=1,500min^{-1} f_z=.039 IPT
D.O.C.=.032" Radial=.354"~.472" OH=5.315"

**Results: 50% faster feed rate than competitor B.
(Comp B's tool failed to perform at this rate)**

SUMITOMO

CARBIDE - CBN - DIAMOND

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