

High Feed Milling Cutters

“Metal Slash Mill” **MSX** type



- High Shear Cutting Action
- Ultra High Feed Rates
- Vibration Free Machining
- Rapid chip removal

Metal Slash Mill MSX Type

Ultra High Feed

Boosts productivity – Cuts costs



■ Features

The Metal Slash Mill type MSX is a new multi function high shear milling cutter with ultra high feed capability suitable for face milling, slotting, plunging and helical boring. At 50GPa the ultra hard Super ZX coated inserts feature a sharp cutting edge which demonstrates extreme resistance to wear and heat massively boosting productivity and tool life.

The vibration free cutting action ensures accurate sizing, improved surface finish and protection of the machine tool/workpiece from damage. Inserts are double clamped in wide chip gullets to maximise rigidity and chip evacuation with temperature at the cutting edge being easily controlled via an optional air blast through integral coolant holes. The MSX cutter is readily applied to general purpose machining across the P (steel) M (stainless) and K (cast iron) range of workpiece materials with impressive results.

■ Advantage

Integral Coolant Hole

Optimised chip removal
– massive chip
evacuation pockets

Durable Cutter Body

Special alloyed steel
with hard surface

Wide Application Range

Face milling, slotting,
helical boring
and plunging

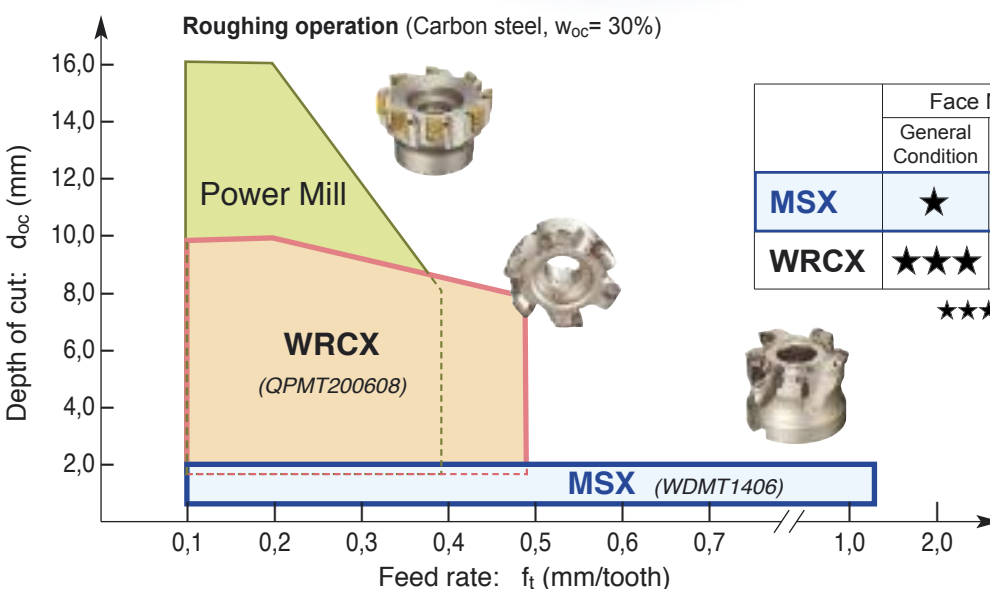
Double Clamp

Secure insert clamping
for stable cutting

Low Cutting Force

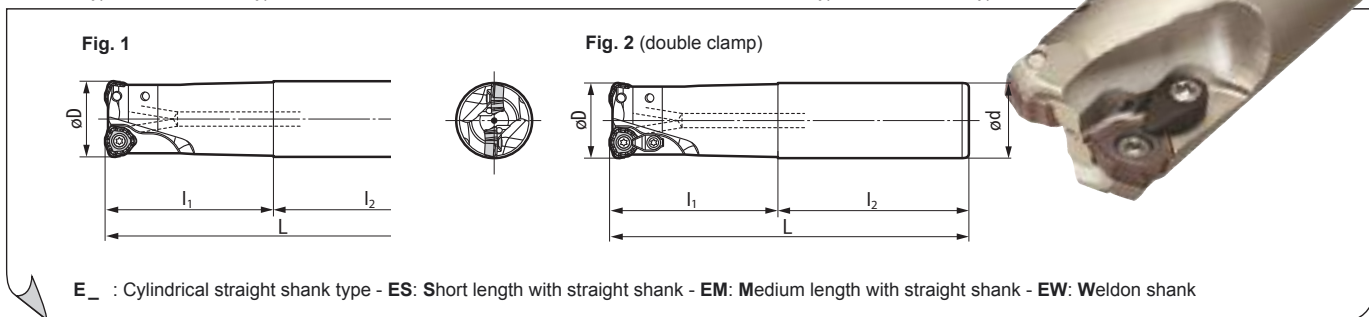
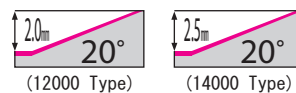
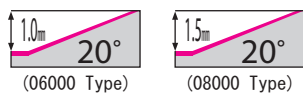
Unique insert shape
reduces cutting force

■ Application Range



Metal Slash Mill MSX 06000E/08000E

Metal Slash Mill MSX 12000E/14000E



Body (Straight Shank) Insert: WDMT06 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX06016ES	○	16	16	30	80	110	2	1
	MSX06016EM	●	16	16	70	80	150	2	1
	MSX06016EM15		16	15	30	120	150	2	1
	MSX06017EM	○	17	16	20	130	150	2	1
	MSX06018EM	○	18	16	20	130	150	2	1
	MSX06020ES	●	20	20	50	80	130	3	1
	MSX06020EM	●	20	20	100	80	180	3	1
	MSX06020EM19		20	19	50	130	180	3	1
	MSX06022EM	○	22	20	30	150	180	3	1
	MSX06025ES	●	25	25	60	80	140	3	1
	MSX06025EM	●	25	25	120	130	250	3	1
	MSX06025EM24		25	24	60	190	250	3	1

Body (Straight Shank) Insert: WDMT12 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX12032ES	●	32	32	70	80	150	2	2
	MSX12032EM	●	32	32	120	130	250	2	2
	MSX12035EM	○	35	32	50	200	250	2	2
	MSX12040ES	○	40	32	50	100	150	3	2
	MSX12040EM	○	40	32	50	200	250	3	2
	MSX12050EM	○	50	42	50	200	250	4	2

Body (Weldon Shank) Insert: WDMT12 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX12032EW	●	32	32	70	80	150	2	2

Body (Weldon Shank) Insert: WDMT06 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX06020EW	●	20	20	50	80	130	3	1
}	MSX06025EW	●	25	25	60	80	140	3	1

Body (Straight Shank) Insert: WDMT14 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX14040ES	○	40	32	50	100	150	2	2
	MSX14040EM	○	40	32	50	200	250	2	2
	MSX14050ES	○	50	42	50	100	150	3	2
	MSX14050EM	○	50	42	50	200	250	3	2
	MSX14063ES	○	63	42	50	100	150	4	2
	MSX14063EM	○	63	42	50	200	250	4	2

● =Euro stock
○ =Stock item in Japan

Body (Straight Shank) Insert: WDMT08 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX08020ES	●	20	20	50	80	130	2	1
	MSX08020EM	●	20	20	100	80	180	2	1
	MSX08020EM19		20	19	50	130	180	2	1
	MSX08022EM	○	22	20	30	150	180	2	1
	MSX08025ES	●	25	25	60	80	140	2	2
	MSX08025EM	●	25	25	120	130	250	2	2
	MSX08025EM24		25	24	60	190	250	2	2
	MSX08028EM	○	28	25	40	210	250	2	2
	MSX08032ES	○	32	32	70	80	150	3	2
	MSX08032EM	○	32	32	120	130	250	3	2
	MSX08035EM	○	35	32	50	200	250	3	2

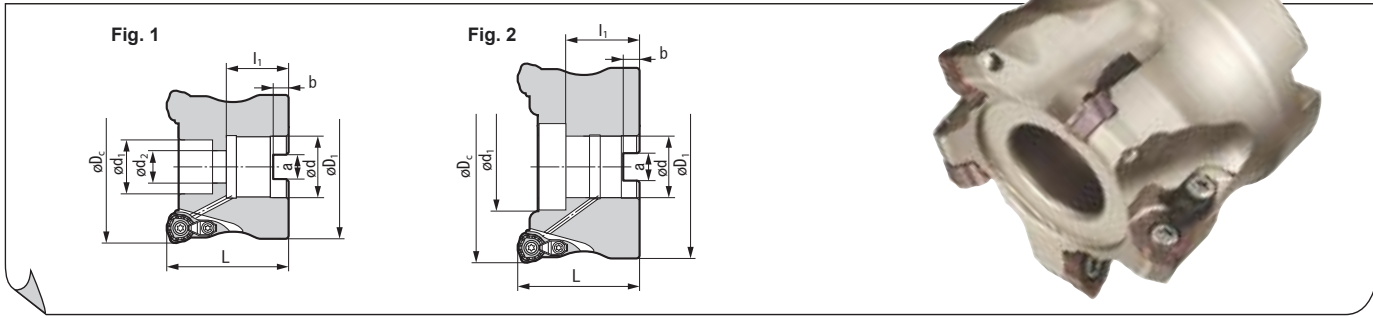
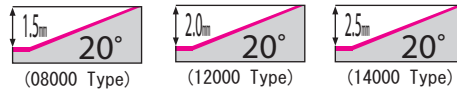
Body (Weldon Shank) Insert: WDMT08 Type

Shank	Cat. No.	Stock	Dimensions (mm)					No. of teeth	Fig.
			ϕD	ϕd	l_1	l_2	L		
}	MSX08020EW	●	20	20	50	80	130	2	1
}	MSX08025EW	●	25	25	60	80	140	2	2
}	MSX08032EW	●	32	32	70	80	150	3	2

Spare Parts

Screw	Wrench	Clamp	C ring	Clamp screw	Applicable body
BFTX02505IP	TRDR08IP	-	-	-	MSX06000E
BFTX0306IP	TRDR08IP	-	-	-	MSX08020E, MSX08022E
BFTX0306IP	TRDR08IP	CCH3,5	CR03	BFTX03510IP08	MSX08025E, MSX08028E, MSX08032E, MSX08035E, MSX08000RS
BFTX0409IP	TRDR15IP	CCH3,5	CR03	BFTX03510IP15	MSX12000E, MSX12000RS
BFTX0511IP	TRDR20IP	CCH4,5	CR03	BFTX04513IP20	MSX14000E, MSX14000RS

Metal Slash Mill MSX 08000RS / 12000RS / 14000RS type



Body (Shell)

Insert: WDMT08 Type

Cat. No.	Stock	Dimensions (mm)									No. of teeth	Fig.
		ϕD_c	ϕD_1	L	ϕd	a	b	l_1	ϕd_1	ϕd_2		
MSX08040RS	●	40	37	45	16	8,4	5,6	18	13,5	9	4	1

Body (Shell)

Insert: WDMT12 Type

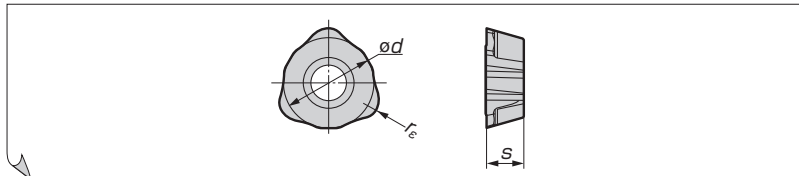
Cat. No.	Stock	Dimensions (mm)									No. of teeth	Fig.
		ϕD_c	ϕD_1	L	ϕd	a	b	l_1	ϕd_1	ϕd_2		
MSX12050RS	●	50	47	50	22	10,4	6,3	20	18	11	4	1
MSX12052RS	●	52	47	50	22	10,4	6,3	20	18	11	4	1
MSX12063RS	●	63	60	50	22	10,4	6,3	20	18	11	5	1
MSX12066RS	●	66	60	63	27	12,4	7	25	20	13,5	5	1

Body (Shell)

Insert: WDMT14 Type

Cat. No.	Stock	Dimensions (mm)									No. of teeth	Fig.
		ϕD_c	ϕD_1	L	ϕd	a	b	l_1	ϕd_1	ϕd_2		
MSX14050RS	●	50	47	50	22	10,4	6,3	20	17	11	3	1
MSX14063RS	●	63	60	50	22	10,4	6,3	20	18	11	4	1
MSX14066RS	●	66	60	63	27	12,4	7	25	20	13,5	4	1
MSX14080RS	●	80	76	63	27	12,4	7	25	20	13,5	5	1
MSX14100RS	●	100	96	63	32	14,4	8,5	32	44	-	6	2

Insert



	Cat. No.	Dimensions (mm)			Coated Carbide		
		ϕd	s	r_e	ACP200	ACP300	ACK300
General type	WDMT 0603 ZDTR	6,35	3,0	1,5	●	●	●
	WDMT 0804 ZDTR	8,5	4,0	2,0	●	●	●
	WDMT 1205 ZDTR	12	5,0	2,0	●	●	●
	WDMT 1406 ZDTR	14	6,0	2,0	●	●	●
Strong edge	WDMT 0603 ZDTR-H	6,35	3,0	1,5	●	●	●
	WDMT 0804 ZDTR-H	8,5	4,0	2,0	●	●	●
	WDMT 1205 ZDTR-H	12	5,0	2,0	●	●	●
	WDMT 1406 ZDTR-H	14	6,0	2,0	●	●	●

Body / Insert

Body series	Applicable insert
MSX 06000	WDMT 06...
MSX 08000	WDMT 08...
MSX 12000	WDMT 12...
MSX 14000	WDMT 14...

● =Euro stock
○ =Stock item in Japan

ISO	Grade	P01	P10 (M10)	P20 (M20)	P30 (M30)	P40 (M40)	Characteristic · Application
P (Steel)	ACP200 ACP300	ACP200					Super ZX ultra hard coated grade for general steels and die steels
M (Stainless)		ACP300					Super ZX ultra hard coated grade with super tough substrate for heavy roughing and stainless steels
K (Cast iron)	ACK300	K01	K10	K20	K30	K40	Super ZX ultra hard coated grade with tough fine grain substrate for cast and ductile irons
		ACK300					

Metal Slash Mill MSX Type

Recommended Cutting Conditions

Work Material	Insert Grade	Cutting Speed V_c (m/mm)	Insert Cat. No.	Endmill										Shell			
				$\phi 16$		$\phi 20$		$\phi 25$		$\phi 32$		$\phi 40$		$\phi 50/63$		$\phi 80/100$	
				d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)	d_{oc} (mm)	Feed Rate (mm/t)
General Steel Below 200HB	ACP200	100-150-200	WDMT0603	0,8	0,8	0,8	0,8	0,8	0,8	-	-	-	-	-	-	-	-
			WDMT0804	-	-	1,0	1,0	1,0	1,2	1,0	1,2	-	-	-	-	-	-
			WDMT1205	-	-	-	-	-	-	1,2	1,4	1,2	1,4	1,2	1,4	-	-
			WDMT1406	-	-	-	-	-	-	-	-	1,5	1,5	1,5	1,5	1,5	1,5
Alloy Steel Below HRC45	ACP200	80-130-180	WDMT0603	0,7	0,8	0,7	0,8	0,7	0,8	-	-	-	-	-	-	-	
			WDMT0804	-	-	0,8	1,0	0,8	1,2	0,8	1,2	-	-	-	-	-	-
			WDMT1205	-	-	-	-	-	-	1,0	1,4	1,0	1,4	1,0	1,4	-	-
			WDMT1406	-	-	-	-	-	-	-	-	1,3	1,5	1,3	1,5	1,3	1,5
Stainless Steel	ACP300	80-120-150	WDMT0603	0,8	0,7	0,8	0,7	0,8	0,7	-	-	-	-	-	-	-	
			WDMT0804	-	-	1,0	0,8	1,0	0,8	1,0	0,8	-	-	-	-	-	-
			WDMT1205	-	-	-	-	-	-	1,2	1,2	1,2	1,2	1,2	1,2	-	-
			WDMT1406	-	-	-	-	-	-	-	-	1,5	1,3	1,5	1,3	1,5	1,3
Cast Iron GG, GGG	ACK300	100-150-200	WDMT0603	0,8	1,0	0,8	1,0	0,8	1,0	-	-	-	-	-	-	-	
			WDMT0804	-	-	1,0	1,2	1,0	1,4	1,0	1,4	-	-	-	-	-	-
			WDMT1205	-	-	-	-	-	-	1,2	1,5	1,2	1,5	1,2	1,5	-	-
			WDMT1406	-	-	-	-	-	-	-	-	1,5	1,8	1,5	1,8	1,5	1,8
Hardened Steel Below HRC50	ACK300	40-80-100	WDMT0603	0,5	0,5	0,5	0,5	0,5	0,5	-	-	-	-	-	-	-	
			WDMT0804	-	-	0,5	0,6	0,5	0,8	0,5	0,8	-	-	-	-	-	-
			WDMT1205	-	-	-	-	-	-	0,6	1,0	0,6	1,0	0,6	1,0	-	-
			WDMT1406	-	-	-	-	-	-	-	-	1,0	1,2	1,0	1,2	1,0	1,2

Cat. No.	Max. d_{oc}
WDMT 0603....	1,0
WDMT 0804....	1,5
WDMT 1205....	2,0
WDMT 1406....	2,5

The above cutting conditions may require adjustment according to machine and/or work rigidity.

The above figures are guidelines for use with BT50 machine tool.

The above cutting conditions assume a tool overhang length of $L/D = 3$ (i.e. overhang length is 3 times tool diameter) or less.

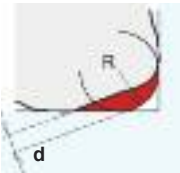
When tool overhang is **more than $L/D=3$ and less than or equal $L/D=5$** , settings should be adjusted to approximately **70% to 80%** of those indicated in the above cutting conditions (i.e. d_{oc} and Feed Rate).

When tool overhang is **more than $L/D=5$ and less than or equal $L/D=8$** , settings should be adjusted to approximately **50% to 60%** of those indicated in the above cutting conditions (i.e. d_{oc} and Feed Rate).

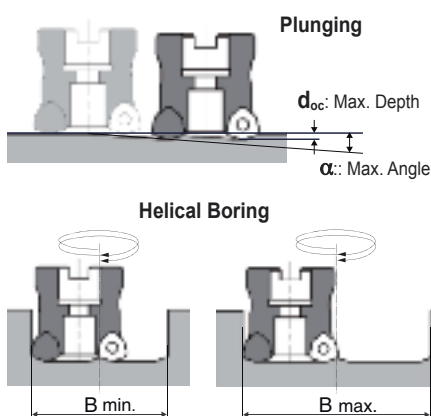
Information for Programming

For machine programming, please use the theoretical corner radius (R) shown in the list.

Maximum depth (d) between theoretical radius and actual profile will be left on the finished surface, as shown below.

	Body	Insert	Theoretical Radius (R)	Remaining Depth (d)
	MSX06000	WDMT0603....	2,0	0,403
	MSX08000	WDMT0804....	2,5	0,593
	MSX12000	WDMT1205....	3,0	1,030
	MSX14000	WDMT1406....	3,5	1,219

Plunging and Helical boring



Cutter ϕ	WDMT0603ZDTR			WDMT0804ZDTR			WDMT1205ZDTR			WDMT1406ZDTR		
	d_{oc} : max 1,0			d_{oc} : max 1,5			d_{oc} : max 2,0			d_{oc} : max 2,5		
	Plunging α max.	min. ϕB	max. ϕB	Plunging α max.	min. ϕB	max. ϕB	Plunging α max.	min. ϕB	max. ϕB	Plunging α max.	min. ϕB	max. ϕB
16	6°00'	21	31									
17	5°00'	23	33									
18	4°30'	25	35									
20	3°30'	29	39	7°30'	25	38						
22	3°00'	33	43	5°30'	29	42						
25				4°00'	35	48						
28				3°00'	41	54						
32				2°30'	49	62	6°30'	42	63			
35				2°00'	55	68	5°00'	48	69			
40							4°00'	58	79	6°00'	53	78
50							2°30'	78	99	3°30'	73	98
63										2°00'	99	124
80										1°30'	133	158
100										1°00'	173	198

Metal Slash Mill MSX Type

Application Examples

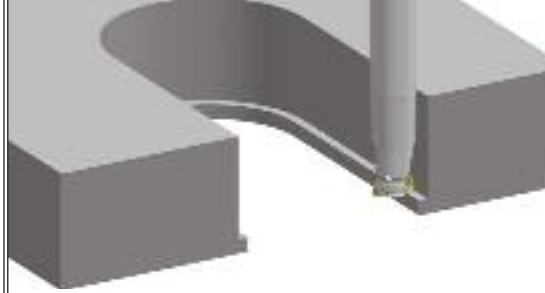
● Helical boring: Ck15



20% higher productivity
Good chip evacuation and less damage at the cutting edge

Tool: MSX 12032 EM
Insert: WDMT 1205 ZDTR (ACP200)
Cutting data: $v_c = 170$ m/min, $n = 1700$ min⁻¹, $f_t = 1,5$ mm/tooth
 $d_{oc} = 0,8$ mm, $w_{oc} = 7$ mm

● Countering: 42CrMo4



50% higher feed rate

Tool: MSX 12032 EM
Insert: WDMT 1205 ZDTR (ACP200)
Cutting data: $v_c = 150$ m/min, $n = 1500$ min⁻¹, $f_t = 1,0$ mm/tooth
 $d_{oc} = 0,8$ mm, $w_{oc} = 9\sim 12$ mm

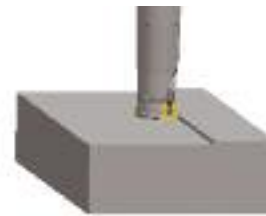
● Engraving: Low carbon steel



After 6 hours milling, insert continues to cut

Tool: MSX 12032 EM
Insert: WDMT 1205 ZDTR (ACP200)
Cutting data: $v_c = 200$ m/min, $n = 2000$ min⁻¹, $v_f = 4000\sim 12000$ mm/min
 $f_t = 1,0\sim 3,0$ mm/tooth, $d_{oc} = 0,8$ mm, $w_{oc} = 32$ mm

● Face milling: 40NiCrMo2



No vibration, No noise, No chipping after 1 hours cutting

Tool: MSX 12032 EM
Insert: WDMT 1205 ZDTR (ACP200)
Cutting data: $v_c = 150$ m/min, $n = 1500$ min⁻¹, $f_t = 1,3$ mm/tooth
 $d_{oc} = 1,0$ mm, $w_{oc} = 20$ mm



CARBIDE - CBN - DIAMOND

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